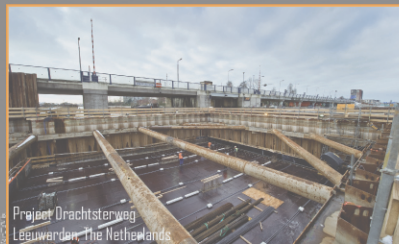


Master's Thesis

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



Lonneke Cheung | Master Construction Management and Engineering | 22-05-2015

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PROJECT DETAILS

Master's thesis project:

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

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Preface

This report is the result of my research to conclude the Master Construction Management and Engineering at the University of Technology in Delft, the Netherlands. The research was conducted within the company Royal HaskoningDHV in Amsterdam, the Netherlands, using their resources and projects. The research aims at creating the desired situation of a more efficient and effective change management process on complex D&B infrastructure projects based on mutual trust between the client and the contractor, so that variations lead to no/minimal time and cost overruns on the project. This research is specifically relevant for clients and contractors who use the UAC-IC 2005 and consultants who help these parties with e.g. project management and contract management. Clients can minimize time and cost overruns due to variations, whereas contractors can minimize their losses due to variations. Consultants can deliver a better job in advising their clients. This research could also be relevant for CROW, the institute that created the UAC-IC 2005. CROW could e.g. take into account the findings of this research if they are going to revise the UAC-IC 2005.

My special thanks go to the graduation committee (Monika, Marian, Leon and Marc) for their time, support and good advices, which provided the focus I needed during the research. Further, I would like to thank Royal HaskoningDHV for facilitating the execution of the research, and all interviewees for their time and co-operation in this research. Lastly, I would like to thank my family and friends for their support during this Master's study.

Lonneke Cheung

Honselersdijk, May 22nd, 2015

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Executive summary

Introduction

In the past decade, a lot has changed in the construction industry in the Netherlands, especially in the infrastructure segment. The use of the Design & Build (D&B) project delivery system has increased since the introduction of the Uniform Administrative Conditions for Integrated Contracts 2005 (UAC-IC 2005), partly at the expense of the Design-Bid-Build (DBB) project delivery system. This increase is mainly caused by policy changes at two public organizations Rijkswaterstaat (national roads and waterways) and ProRail (railways), which are responsible for large national infrastructure projects (ProRail, 2012; Rijkswaterstaat, 2004, 2014). The focus of this research is on an existing problem on DBB projects, which is an inefficient and ineffective change management process. It was felt by Royal HaskoningDHV that this problem was still not resolved on D&B projects and that it was mainly caused by distrust between the client and the contractor due to the lack of transparency about both parties' intentions and the lack of sharing relevant information. Such problem may eventually lead to time and cost overruns of the project. Compared to DBB, the impact of an inefficient and ineffective change management process may be much bigger on D&B projects due to the overlap of the design phase and construction phase (Koch, Gransberg, & Molenaar, 2010, p. 197). The following proposition is formulated for this research: *The inefficiency and the ineffectiveness of the change management process on D&B projects is mainly caused by distrust between the client and the contractor.* The objective of the research is to determine to what extent mutual trust between the client and the contractor influences the efficiency and the effectiveness of the change management process on complex D&B infrastructure projects in order to provide recommendations for mutual trust on such projects in the Netherlands which could be added to the UAC-IC 2005 in the form of an annex. In order to achieve this objective, the UAC-IC 2005 was compared to two other D&B standard forms of contract, the FIDIC Yellow Book and the NEC3 ECC, to see whether there are aspects related to trust and the change management process which can be derived from them. The FIDIC's conditions of contract are known as very rigid contracts which are likely to lead to confrontations between client and contractor, whereas the NEC family of contracts are well known for encouraging an open, co-operative, no-blame, non-adversarial team approach (Potts, 2008, pp. 258-259, 247-248). The research question (RQ) and sub questions (SQ) are as follows:

RQ: To what extent does mutual trust between the client and the contractor influence the efficiency and the effectiveness of the change management process on complex D&B infrastructure projects, and which aspects can be derived from the comparison between the UAC-IC 2005 and the NEC3 ECC and the FIDIC Yellow Book to create an efficient and effective change management process based on mutual trust for such projects using the UAC-IC 2005?

- SQ1. Which aspects are necessary according to theories on trust in order to achieve mutual trust between the client and the contractor on complex D&B infrastructure projects?
- SQ2. Which aspects are necessary according to theories on change management in order to achieve an efficient and effective change management process on complex D&B infrastructure projects?
- SQ3. Which criteria with regard to construction project management and construction contract law are relevant for assessing trust and the change management process on complex D&B infrastructure projects?
- SQ4. To what extent do the UAC-IC 2005, the NEC3 ECC and the FIDIC YB meet the set of assessment criteria?
- SQ5. To what extent do the case study projects A+B, C and D in which the UAC-IC 2005, the NEC3 ECC and the FIDIC YB were applied respectively meet the set of assessment criteria and correspond to the assessment results of question 4?
- SQ6. What can be learned by comparing the four case study results with regard to the influence of mutual trust between the client and the contractor on the efficiency and the effectiveness of the change management process on complex D&B infrastructure projects?

Research design

The research design consists of two research strategies: the literature survey and the comparative case study. The figure below shows the research strategies and the sub questions associated to them. In general, each sub question functions as input for the next sub questions and in the end, all sub questions together serve as input for the main research question. The research design is as follows: the literature survey on mutual trust between the client and the contractor (SQ1) and on efficient and effective change management (SQ2) based on the consultation of relevant literature yielded the assessment criteria and the assessment models for trust and change management (SQ3), by means of which the UAC-IC 2005, NEC3 ECC and FIDIC yellow book were evaluated based on the consultation of the standard forms of contract and relevant literature (SQ4). Subsequently, based on these assessments a case study of a complex D&B project was conducted for each standard form of construction contract by means of project records studies and face-to-face interviews (SQ5) to validate the effectiveness of the contract clauses found in SQ4 in practice and to identify other trust building and efficiency and effectiveness creating aspects. A comparison of the results of these case studies concluded with determining the influence of mutual trust between the client and the contractor on the efficiency and the effectiveness of the change management process in these complex D&B infrastructure projects, and with providing general recommendations in terms of this aspect (SQ6). The answer to the main research question is generalized from the answer to SQ6, but the recommendations are for the UAC-IC 2005 specifically.

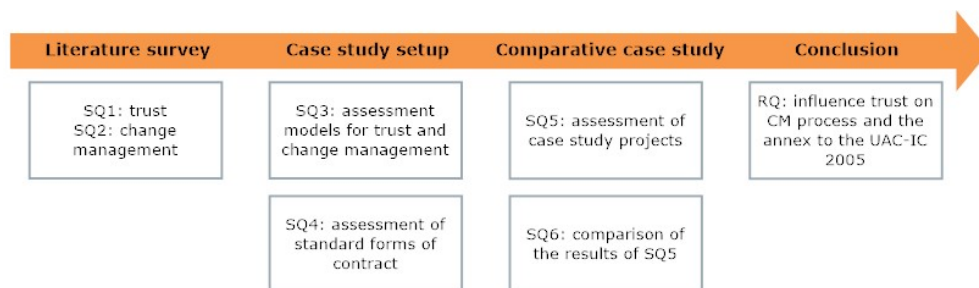


Figure 5: Overview of the research design

Literature survey

Building trust between the client and the contractor on D&B construction projects (SQ1)

The objectives of this sub question are to research what trust actually means in the context of the construction industry, to research methods to measure trust and to identify aspects which are important for creating and maintaining trust between the client and the contractor during a project. The findings were used as input for the trust assessment model (SQ3). Literature on trust in general and trust on construction projects were consulted and analysed in order to achieve these objectives.

(Rousseau, Sitkin, Burt, & Camerer, 1998, p. 395) define trust as ‘a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another’. Trust in the context of this research can be described as the belief that the other party is capable and reliable based on their competences and past performances to perform their obligations on the project, while also taking into account that this party has your best interests at heart and adheres to your set of principles. Two fundamental conditions for trust to arise are risk (i.e. the risk of the other party not meeting the expectations) and interdependence (i.e. both parties’ interests cannot be achieved without the other party) (Rousseau et al., 1998, p. 395).

Trust can be divided into five levels: distrust, low trust, confident trust, high/strong trust and complete trust. In the lowest two levels, trust is based on macro-sources such as contracts, laws and code of conducts, in the middle level, trust is based on one’s trustworthiness (i.e. ability, benevolence, integrity and predictability/reliability), and in the highest two levels, trust is based on micro-sources such as the relationship and affection (Dietz & Den Hartog, 2006, pp. 561-564 and references therein). The contract between the client and the contractor is a macro-source and can have the following functions: to safeguard of the interests of both parties legally, to coordinate (i.e. to specify both parties’ goals and the ways to achieve these), to safeguard for contingencies and

to demonstrate both parties' commitment (Woolthuis, Hillebrand, & Nooteboom, 2005, pp. 833-835). The principle of objective good faith in laws, also a macro-source, may be a basis for trust as well. In general, civil law systems do recognize the principle of good faith in an objective sense, whereas common law systems do not (Fauvarque-Cosson & Mazeaud, 2008, pp. 196-198; Hesselink, 2010, pp. 619-620). In most systems, objective good faith has three functions: concretization or interpretation, supplementation, and correction or limitation (Fauvarque-Cosson & Mazeaud, 2008, pp. 182-190; Hesselink, 2010, pp. 627, 630-631). Besides differences in the laws, it is important to note that trust may also be perceived differently per culture. The maturity model for relationships by (Meng, Sun, & Jones, 2011) can be used as a tool to measure the trust level in the client-contractor relationship in a quantitative way in order to determine the current level and the aspects that should be addressed to improve it. A part of the maturity model is shown in the table below.

Table 1: Example of the maturity model for relationships in construction (Meng et al., 2011)

Main criteria	Sub criteria	Level 1: Price competition	Level 2: Quality competition	Level 3: Project partnering	Level 4: Strategic partnering/ alliance
Trust	Type of trust	Contractual trust	Competence trust	Short-term goodwill trust	Long-term goodwill trust
	Confidence in others' behaviour	Little confidence	Some confidence	Much confidence	Full confidence
	Monitoring others' work	Checking and double checking	Checking somewhat reduced	Checking greatly reduced	Checking almost unnecessary
Collaboration	Working relationship	Confrontation or arm's length	Limited cooperation	Collaboration	Close collaboration
	Culture	Mutual blame	Self defence	Abandon of blame culture	Problem solving focused culture
	Mutual help	No support for the weaker	Support only with the issues related to self-interest	Often support for a weak partner	Always support for a weak partner

The table below summarizes the components which have to be acknowledged in order to achieve mutual trust between the client and the contractor on construction projects in general. There was no literature with regard to building trust on non-partnering D&B projects specifically. The components consist of joint activities and processes that can build and sustain trust between the client and the contractor. The components for building initial trust at the start of the project (including the tender phase) include the selection of the Contractor, the setup of the contract and the setup of the joint project management systems, whereas the components for building and sustaining trust during project implementation are dependent on the people involved, how they interpret that contract and how they apply those joint project management systems.

Table 2: List of trust components based on the comparison of (Jin & Yng Ling, 2005; Kadefors, 2004; Khalfan, McDermott, & Swan, 2007; Wang & Yin, 2013; Wong, Cheung, Yiu, & Pang, 2008)

Build initial trust at the start of the project (including the tender phase)	Build and maintain trust during project implementation
Components ▪ Seek party with good track record, reputation and competence of financial and risk management ▪ Seek party with similar culture/policy ▪ Joint goal setting (e.g. by formalized team building workshops) ▪ Clearly defined system of communication procedures and approaches ▪ Adopt joint problem-solving philosophy ▪ Draft a clear, unambiguous and equitable contract ▪ Agreed system for achieving continuous improvement of the relationship	Components ▪ Reasonable behaviour (=working fairly and professionally) ▪ Repeated fulfilment of communications/interactions ▪ Problem-solving to mutual satisfaction at the lower levels ▪ Emotional investments (e.g. by formalized team building workshops)

Creating an efficient and effective change management process on D&B construction projects (SQ2)

The objectives of this sub question are to research what change management actually means in the context of the construction industry, to research methods to measure change management and to identify aspects which are important for creating an efficient and effective change management process. The findings were used as input for the change management assessment model (SQ3). Literature on changes and change management systems on construction projects were consulted and analysed in order to achieve these objectives.

(Lazarus, Clifton, & Britain, 2001, p. 10) define a change or a variation as 'an alteration or a modification to pre-existing conditions, assumptions or requirements'. This research is focused on variations to the contract between

the client and the contractor, more specifically on scope changes. Change management is defined as ‘the establishment and maintenance of a project culture and systems to control and review changes to the project prior to their implementation’ (Lazarus et al., 2001, p. 19). On D&B projects, the design phase and the construction phase overlap for a large part, which means that construction already starts when the design is not final yet. Therefore, compared to DBB projects, the opportunity to introduce changes decreases faster and the costs of changes increases faster in D&B projects (Koch et al., 2010, p. 197; Lazarus et al., 2001, p. 20). Change management should be used during the project to minimize the impact on the costs and the programme of the implementation of variations.

The maturity model for change management by (Sun & Oza, 2008) can be used as a tool to measure the change management level in quantitative way in order to determine the current level and the aspects that should be considered to improve the change management level. The table below shows a part of the maturity model.

Table 3: Example of the maturity model for change management (Sun & Oza, 2008)

Main criteria	Level 1 Ad-hoc change management	Level 2 Informal change management	Level 3 Systematic change management	Level 4 Integrated change management	Level 5 Continuous improvement in change management
MANAGEMENT PROCESS	There are no consistent change management procedures or practices. Any change management process, that might exist, is not shared by the whole team. The project team is reactive to changes rather than anticipates them. There is a poor audit trail of the change management process. Changes are rarely reviewed after they occurred.	Change management processes exist, however they are not followed on a consistent basis. Many changes are handled informally without following the correct processes. The project team is still largely reactive to changes rather than anticipates them. Documentation record is poor. Changes are sometimes reviewed after they occurred.	Change management processes are followed on a consistent basis. The whole project team shares the same processes, although each team member may still operate a localized process in parallel. The project team begins to be proactive in anticipating changes. Audit trail is recorded. There is a requirement of review after a change.	Standard change management processes are adopted and followed consistently by the whole team. Processes are efficiently implemented, possibly with the support of an IT tool. Most changes are managed proactively. Change management audit trail is complete using standard documents and forms. Changes are reviewed in various contexts.	Change Management performance evaluation metrics are developed and implemented. Processes are monitored and analysed for potential improvement. The project team takes full advantage of technology support. Learning is regarded as an essential part of Change Management process.

The table below shows the principles and the components which have to be included in a change management system to achieve an efficient and effective change management process on construction projects in general. There was no literature with regard to change management systems specifically for D&B projects. The components consist of joint activities and processes that build and sustain efficient and effective change management. The components for the first principle include the setup of joint project management systems to deal with variations, whereas the components for other principles are dependent on the people involved and how they apply those joint project management systems.

Table 4: List of change management components based on the comparison of (Arain & Pheng, 2007; Egan, Seder, & Anderson, 2012; Ibbs, Wong, & Kwak, 2001; Lazarus et al., 2001; Sun, Fleming, Senaratne, Motawa, & Yeoh, 2006)

Principles	Components
1. Anticipate change	- Align project goals and objectives - Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider - Agree on project philosophy with regard to risk allocation - Prior identification of areas where changes likely occur (e.g. by risk management)
2. Recognize change	- Early identification of potential changes - Assess potential impact (e.g. by value engineering) and create a proposed change order - Document the proposed change in a log
3. Evaluate change	- Determine priority of the change - Selection of optimum change options by consulting all relevant parties - Identify the likely impacts of different change options - Prompt decision making as to whether to accept/reject the change by someone with authority
4. Resolve change	- Communicate final change decision to all team members whose work is affected by it - Appropriate documentation to record all decisions within the change process
5. Monitor implementation	Monitor and record implementation
6. Learn from change	- Conduct a review and create lessons learned from the change event - Update shared databases and incorporate lessons learned for project and organization

Case study setup

Assessment models for trust and change management (SQ3)

The objective of this sub question is to create an assessment model for trust and for change management which can be used to assess and compare the standard forms of contract and the case study projects. To achieve this objective the components and the maturity models for trust and change management found by means of the literature survey were used to create the assessment models.

The assessment model for trust is shown in the first table below. The criteria consist of the components for building trust, which resulted from the literature study on trust (SQ1). The maturity model by (Meng et al., 2011) was transformed and aligned to the criteria in the assessment model, which means that some aspects were omitted, shifted or adapted. The author has rated the criteria in the assessment model by means of the adapted maturity model. These scores form a standard for the three contracts and the case study projects. The trust level of this standard is 2.91, which implies that a high/strong trust relationship is required between the client and the contractor according to the findings in the literature. To explain the scoring process, a part of the adapted maturity model is given in the second table below. The topic 'objectives' which is related to criteria (3) can be divided into sub topics. All criteria will be given a score from level 1 to 4, which is the average of the scores of the sub topics. According to highlighted sub subtopics in the second table below, the score for criteria (3) is 2.5. If all criteria scores are known, the total level of the trust relationship can be calculated by taking the average of all these scores. The scores per criteria of the contracts and the case study projects can be compared with the standard in order to see which aspects should be addressed to improve the trust level.

Table 5: Assessment model for trust

Objective	Phase	Topic	Criteria = standard	Based maturity model adapted from (Meng et al., 2011)	
				Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	
			(2) Seek party with similar culture/policy	3	
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2.5
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	
TOTAL LEVEL OF TRUST RELATIONSHIP			2.91		

Table 6: Example of the customized maturity model for relationships in construction adapted from (Meng et al., 2011)

Criteria	Topic	Sub Topic	Level 1 Low trust relationship	Level 2 Confident trust relationship	Level 3 High/strong trust relationship	Level 4 Complete trust relationship
(3)	OBJECTIVES	Objectives alignment	Only self-objectives	Mainly self-objectives	Mutual objectives in a project	Mutual objectives in the long-term
		Benefits	Win-Lose	Win-Partial win	Win-Win in a single project	Win-Win in the long-term

The assessment model for change management is shown in the first table below. The criteria consist of the components in the change management system, which resulted from the literature study on change management (SQ2). The maturity model by (Sun & Oza, 2008) was transformed and aligned to the criteria of the

assessment model. Professor Ming Sun was also involved in developing the maturity model used for trust, which is noticeable as the two models are quite aligned. The first maturity level 'ad-hoc' change management was discarded in order to make this maturity model compatible to the maturity model for trust. The initial idea was to analyse the data by means of comparing the scores for trust and change management and noticing patterns in them which indicate the influence of trust on the change management process. After collecting all the data, it turned out that this data analysis technique would not be effective in finding such patterns. Furthermore, the descriptions in the maturity model were sorted, sub topics were added, and some aspects were omitted, shifted or adapted. The author has rated the criteria in the assessment model by means of the adapted maturity model. These scores form a standard for the three contracts and the case study projects. The change management level of this standard is 3.19, which implies that integrated change management is required between the client and the contractor according to the findings in the literature. A part of the adapted maturity model for change management is given in the second table below. The scoring process is similar to the one for trust. If all criteria scores are known, the total level of change management can be calculated by taking the average of all these scores. The scores per criteria of the contracts and the case study projects can be compared with the standard in order to see which aspects should be addressed to improve the change management level.

Table 7: Assessment model for change management

Objective	Phase	Topic	Criteria = standard	Based maturity model adapted from (Sun & Oza, 2008)	
				Level (1-4) standard	Level (1-4)
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	
			(6) Update shared databases and incorporate lessons learned for project and organization	4	
	Recognize change	Change management process	(7) Early identification of potential changes	4	3.5
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	
			(9) Document the proposed change in a log	3	
	Evaluate change		(10) Determine priority of the change	3	
			(11) Selection of optimum change options by consulting all relevant parties	3	
			(12) Identify the likely impacts of different change options	3	
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	
			(15) Appropriate documentation to record all decisions within the change process	3	
	Monitor implementation		(16) Monitor and record implementation	3	
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	

Table 8: Example of the customized maturity model for change management adapted from (Sun & Oza, 2008)

Criteria	Aspect	Sub Aspect	Level 1 Informal change management	Level 2 Systematic change management	Level 3 Integrated change management	Level 4 Continuous improvement in change management
(7)	CHANGE MANAGEMENT PROCESS	Approach	The project team is still largely reactive to changes rather than anticipates them.	The project team begins to be proactive in anticipating changes. The project team is 'adaptive' to managing changes.	Most changes are managed proactively. The project team is 'supportive' to managing changes.	The project team is 'proactive' towards change management processes

Assessment of the standard forms of contract (SQ4)

The objective of this sub question is to assess the standard forms of contracts in terms of trust and change management by means of the assessment models in order to determine how facilitating the contracts are for building trust and creating an efficient and effective change management process. The assessments were on the basis of the clauses on trust and change management in the standard forms of contract themselves and the comments found in the literature about those clauses. The assessment results were used as input for the case study projects. One objective of the case study is to validate the effectiveness of the contract clauses regarding trust and change management.

Table 9: Assessment model for trust in the UAC-IC 2005, NEC3 ECC and FIDIC YB (grey=trust building; black=distrust building)

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4) UAC-IC	Level (1-4) NEC3 ECC	Level (1-4) FIDIC YB
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	2.5	-	-
			(2) Seek party with similar culture/policy	3	-	-	-
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2.5	3	1.5
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	1.5	2	2
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	1.5	3	2
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	2	2.5	1.5
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	-	3	-
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	2.5	3	1.5
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	-	-	-
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	2	1.5	1.5
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	-	3	-
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	1.32	1.91	0.91

The two tables above and below show an overview of the assessment results of the UAC-IC 2005, the NEC3 ECC and the FIDIC YB with respect to trust. The three standard forms of contract do not contain provisions for many criteria, as a result they all have quite a low trust level compared to the standard score of the criteria (2.91), which implies that the contracts are not that facilitating in terms of building trust. The NEC3 ECC is the most facilitating with regard to trust, which is mainly due to the principle of good faith explicitly stated in the contract (clause 10.1) and some project management systems and tools which can be used to build trust. The NEC3 can be used as a joint Project Management Plan (PMP) as well, whereas the UAC-IC 2005 and the FIDIC YB require the parties to draw up a separate PMP as these contracts do not contain many project management systems and tools which can be used to build trust. Further, the UAC-IC 2005 does not explicitly state or refer to the principle of good faith in Art. 6:2 and Art. 6:248 in the Dutch Civil Code in the contract.

Table 10: Overview of the assessment results of the UAC-IC 2005, NEC3 ECC and FIDIC YB regarding trust

UAC-IC 2005		NEC3 ECC	FIDIC YB
Trust level	1.32	1.91	0.91
	Low	Confident	Low
Most important aspects which may build trust (ITALIC = distrust)	(1) Procurement Act 2012 (3+8) Good faith in the DCC (6) Equitable risk allocation	(3+8) Clause 10.1 (3) Option for partnering (5) Mutual early warning (5) Risk reduction meetings (5) Open book requirement (6) Option for pain/gain share mechanism (7+11) Option for measuring Contractor's performance (10) Standby DAB (5) Project Manager's dual role (10) Sanctions of CE's time bars	(3+8) Lack of a good faith requirement (5) Parties are fully responsible for their risks (5) Engineer's dual role (6) Unfair risk allocation (10) Sanction of claims time bar

Table 11: Assessment model for change management in the UAC-IC 2005, NEC3 ECC and FIDIC YB (grey=creating efficiency and effectiveness; black=creating inefficiency and ineffectiveness)

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4) UAC-IC	Level (1-4) NEC3 ECC	Level (1-4) FIDIC YB
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	-	-	-
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	3	2.5	2
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	2	2.5	1.5
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	-	2.5	1
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	-	-	-
			(6) Update shared databases and incorporate lessons learned for project and organization	4	-	-	-
	Recognize change	Change management process	(7) Early identification of potential changes	4	2	3	2
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	3	3	3
			(9) Document the proposed change in a log	3	-	-	-
	Evaluate change		(10) Determine priority of the change	3	-	-	-
			(11) Selection of optimum change options by consulting all relevant parties	3	3	3	-
			(12) Identify the likely impacts of different change options	3	3	3	3
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	3	3	3
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	-	-	-
			(15) Appropriate documentation to record all decisions within the change process	3	2	2.5	2
	Monitor implementation		(16) Monitor and record implementation	3	-	-	-
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	1.31	1.56	1.09

The two tables above and below show an overview of the assessment results of the UAC-IC 2005, the NEC3 ECC and the FIDIC YB with respect to change management. Even though all standard forms of contract contain a change management procedure, all three scores for the change management level are quite low as well compared to the standard score of the criteria (3.19), which implies that the contracts are not that facilitating in terms of creating an efficient and effective change management process. The main cause is that the contracts do not contain provisions for many criteria in the assessment model such as for aligning the objectives, learning from changes and some implicit standard change management processes. The levels of the criteria which did receive a score are more or less the same for the three contracts. The main difference between the contracts are the provisions for risk management, which can be used to create a more efficient and effective change management process. The NEC3 ECC is the most facilitating contract with respect to change management, because this contract does contain risk management provisions which are closely related to change management. The UAC-IC 2005 and the FIDIC YB do not contain risk management requirements or they are limited.

Table 12: Overview of the assessment results of the UAC-IC 2005, NEC3 ECC and FIDIC YB regarding change management

	UAC-IC 2005	NEC3 ECC	FIDIC YB
CM level	1.31 Informal	1.56 Informal - Systematic	1.09 Informal
Most important aspects which may create efficiency and effectiveness (ITALIC = inefficiency and ineffectiveness)	(2) Quite efficient and effective (4) Lack of RM requirements (7-16) Absence of some implicit standard CM processes	(2) Open book (3) Option of pain/gain share mechanism (4) Link with RM (7) Mutual early warning (2) Quite extensive and complicated (2) Project Manager's dual role (7-16) Absence of some implicit standard CM processes	(2) Quite straightforward (2) Open-ended sometimes (2) Engineer's dual role (4) Limited RM requirements (7-16) Absence of some implicit standard CM processes

Comparative case study

Assessment of the case study projects (SQ5)

The objective of this sub question is to assess the case study projects in terms of trust and change management by means of the assessment models in order to validate the effectiveness of the contract clauses regarding trust and change management, to research the effectiveness of the project management systems and tools used on the projects with respect to trust and change management, and to research the influence of trust on the change management process on the projects. One case study project was selected for each standard form of contract by means of selection criteria to ensure that the projects would be comparable: project Drachtsterweg (DW, UAC-IC 2005, €33 million, the Netherlands), project Forres Flood Alleviation Scheme (F, NEC2 ECC, €37 million, Scotland) and project Dikkowita Fishery Harbour (DFH, FIDIC YB, €44 million, Sri Lanka). A smaller-sized project was selected as a pilot case study project, project Bijlmerweide (BW, UAC-IC 2005, €1 million, the Netherlands), which later became one of the main case study projects. The data for the case study was collected by means of individual semi-structured face-to-face interviews and written questionnaires. The assessment results of the standard forms of contract (SQ4) and the project records studies served as input for drawing up the questionnaires. The first two objectives were achieved by means of assessing the interview data with the assessment models, and the last objective was achieved by means of noticing direct and indirect links between trust and change management in the assessment data and comparing the answers of the interviewees about this relationship between trust and change management.

Table 13: Overview of the assessment results of the four case study projects regarding trust

	Bijlmerweide	Drachtsterweg	Forres	Dikkowita
Trust level	2.41	2	3.23	2.18
	Confident – High	Confident	High	Confident
Most important aspects which build trust (ITALIC = distrust)	(1+2) Direct agreement procedure (1) MEAT award criterion (3) Focus on the target (3) Adherence to QMS (3) WIN for all parties (8) Contractor's goodwill, passion and motivation (8) Mutual reasonable and fair behaviour (9) A lot of informal communication	(1) <i>Lowest price tender</i> (3) <i>Contradictory project objectives</i> (6) <i>'Like it or lump it' contract</i> (8) <i>Employer's traditional way of acting</i> (8) <i>No mutual reasonable and fair behaviour</i>	(x) Client leadership (x) Strategic partnership (1+2) Best Value Procurement (3) Focus on the target (3) WIN for all parties (3) Mutual project objectives (5) Joint problem-solving (5) Open book (6) Negotiated contract (6) Pain/gain share mechanism (8) Mutual reasonable and fair behaviour (8) Selection of the right people (9) A lot of informal communication	(1) Direct negotiations (3) High quality product (6) Negotiated contract (8) Confidence in each other's competences (9) A lot of informal communication (3) <i>No WIN for all parties anymore</i> (3) <i>Major scope change at beginning</i> (3) <i>Late 'final scope agreement'</i> (3+10) <i>Contractor did not finish the job</i> (5) <i>'Like it or lump it' problem-solving</i> (5) <i>Some unexpected, unjustified or unreasonably priced variations requests and claims</i> (5+8) <i>Engineer's dual role</i> (8) <i>10% of the time mainly self defence</i>

The two tables above and below show an overview of the assessment results of the four case study projects with respect to trust. The trust levels are quite different on the four projects, which is caused by many different factors (see the second table). Only project Forres exceeds the standard trust level of the criteria (2.91), which implies that the trust level on this project is quite high. On all four projects, the criteria for continuous improvement of the relationship (7+11) were not that prevalent, which partly has contributed to lower trust levels compared to the standard trust level. The trust level on project Bijlmerweide is also quite high, the trust level on project Dikkowita is quite low due to a mix of trust and distrust, and the trust level on project Drachtsterweg the lowest. The table above shows the effective and ineffective project management systems and tools for building trust per project.

The case study contains projects which are carried out in different cultures. Trust may be perceived differently per culture, therefore 'culture' was taken into account in the case study as well. Despite the cultural differences, the meaning of trust seems to be more or less the same on all four case study projects, there are two particular reasons for that. First, with regard to project Forres, the British culture mainly differs from the Dutch culture in terms of the Masculinity versus Femininity index (Hofstede, 2015). The British culture is masculine/performance oriented, whereas the Dutch culture is feminine/co-operation oriented. On the Forres project, the contract is performance oriented, but the Project Team is co-operation oriented. On the one hand, the focus is on performance by means of the pain/gain share mechanism and trust implies enforceable trust (i.e. trust in good

performance that is backed up by the option of rewarding and punishing the Contractor). On the other hand, with respect to other matters, trust implies intrinsic trust (i.e. trust that accepts vulnerability) and implicit trust is high on the project. Second, with regard to project Dikkowita, the Sri Lankan culture mainly differs from the Dutch culture in terms of the Power Distance Index and the Individualism versus Collectivism index (Hofstede, 2015). The Sri Lankan culture has a large power distance and is collectivistic, whereas the Dutch culture has a small power distance and is individualistic. On project Dikkowita, the Engineer had full authority to act on behalf of the Employer and he did so. The Engineer and the Contractor's key people were all Dutch, so 'trust' should have had the same meaning for them. Therefore, the cultural differences were not really a big issue on the project, there were merely some cultural differences between the Dutch parties and the Sri Lankan Employer, and between the expats and the Sri Lankans in both the Engineer's and the Contractor's teams.

Table 14: Assessment model for trust in the four case study projects (grey=trust building; black=distrust building)

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4) BW	Level (1-4) DW	Level (1-4) F	Level (1-4) DFH
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	2.5	1.5	3.5	2.5
			(2) Seek party with similar culture/policy	3	2.5	1.5	3.5	2.5
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2.5	2	4	2
			Communication system	(4) Clearly defined system of communication procedures and approaches	3	3	3	3.5
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	2.5	2.5	3.5	2
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	2	1.5	3	2.5
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	1	2	2	1.5
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	3	2	3.5	2.5
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	3	2	3.5	2.5
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	3.5	2	3.5	2
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	1	2	2	1
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	2.41	2	3.23	2.18

On projects Bijlmerweide, Drachtsterweg and Dikkowita, the contract seems to have little influence (about 0-25%) on the trust level between the parties. Most of the trust building aspects on the projects do not stem from the contract, but rather from other factors. The principle of good faith in the UAC-IC 2005 (Art. 6:2 and Art 6:248 in the DCC) does not seem to be very effective and to have much influence on the trust level between the parties either on the projects Bijlmerweide and Drachtsterweg. On both projects, the parties do not act in good faith because it is written in the DCC, but acting in good faith is rather a norm for the people involved on the project. Only at the highest escalation level on project Drachtsterweg, the parties do act in good faith because of the DCC. On project Forres, the NEC2 ECC has a bit more influence (about 50%), because many of the project management systems and tools in the contract which form a basis to create trust were actually applied and were quite effective on the project (e.g. the pain/gain share mechanism, the open book requirement, a risk management procedure and a mutual early warning obligation). The principle of good faith in the NEC2 ECC (clause 10.1) does not seem to have much influence on the trust level between the parties. On project Forres, this 'mutual trust and co-operation' clause is not effective in itself, but it does form a good basis for building trust. The intention of the clause is clear, but it remains open to interpretation and cannot be enforced. Therefore, the creation of trust is very dependent on the people involved. In general, it can be concluded that the standard form of contract has little influence on the trust level between the Employer and the Contractor and that it is not that fundamental for building trust. The amount of influence increases as more project management systems and tools which form a basis to create trust are included in the contract.

The two tables below show an overview of the assessment results of the four case study projects with respect to change management. On all four projects, the change management level is lower than the standard score of the criteria (3.19), which is partly caused by the lack of effort to learn from changes (5+6) on all projects as most variations stem from ‘gaps’ in the contract. Despite the latter, the results show that on all four projects, there is still room for improvement in the efficiency and the effectiveness of the change management process, even though the change management procedure is quite clear and efficient. Project Forres has a higher change management level than the other three projects, which is essentially because risk management is closely related to change management on this project only. The second table below shows the effective and ineffective project management systems and tools for creating an efficient and effective change management process per project.

Table 15: Assessment model for change management in the four case study projects (grey=creating efficiency and effectiveness; black=creating inefficiency and ineffectiveness)

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4) BW	Level (1-4) DW	Level (1-4) F	Level (1-4) DFH
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	2	2.5	3	2
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	3	3	3	2.5
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	2	1.5	3	2.5
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	2	2.5	3.5	2
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	1.5	1.5	2	1
			(6) Update shared databases and incorporate lessons learned for project and organization	4	1	1	2	1
	Recognize change	Change management process	(7) Early identification of potential changes	4	3	2	3	2.5
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	1.5	2	3	3
			(9) Document the proposed change in a log	3	3	3	3	3
	Evaluate change		(10) Determine priority of the change	3	2	2	2	2
			(11) Selection of optimum change options by consulting all relevant parties	3	2.5	2.5	2.5	2.5
			(12) Identify the likely impacts of different change options	3	2.5	2.5	2.5	2.5
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	2.5	2	2.5	2
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	3	3	3	3
			(15) Appropriate documentation to record all decisions within the change process	3	2	2	3	2
	Monitor implementation		(16) Monitor and record implementation	3	1.5	3	3	3
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	2.19	2.25	2.75	2.28

Table 16: Overview of the assessment results of the four case study projects regarding change management

	Bijlmerweide 2.19 Systematic	Drachtsterweg 2.25 Systematic	Forres 2.75 Integrated	Dikkowita 2.28 Systematic
Most important aspects which create efficiency and effectiveness (ITALIC = inefficiency and ineffectiveness)	(x) Mutual trust (2) Clear and efficient CM procedure (7) Largely proactive CM approach (7) Informal discussions (7) Early informal notifications (4) RM not closely related to CM	(2) Clear and efficient CM procedure (7) Informal discussions (7) Separate regular variations meetings (4) RM not closely related to CM (7) Half reactive/half proactive to largely proactive CM approach (7) Ineffective warning obligations (7-16) Disagreements about the price (7-16) Escalations	(1) Aligned RM objectives (2) Clear and streamlined CM procedure (3) Joint risk workshop (3) Clear risk allocation (3) Pain/gain share mechanism (4) RM closely related to CM (4) Clear RM procedure (4) Joint RM (4) Aligned largely proactive RM approach (7) Mutual EW (7) Informal discussions (7) Aligned largely proactive CM approach (7-16) Open book contract (7-16) Involvement of independent Cost Consultant (7-16) No unexpected or contentious variations (7-16) Extensive CE's procedure increases administrative burden	(1) Aligned CM objectives (2) Clear CM procedure (4) RM not closely related to CM (7) Unaligned CM approach (7) Identification of potential variations by means of claims notifications (7-16) Engineer's dual role (7-16) Engineer has no authority to give instructions for variations (7-16) Timelines tended to drift after initial notification (7-16) Project funding and associated requirements (7-16) Unexpected, unjustified or unreasonably priced variations requests and claims

On project Bijlmerweide, the UAC-IC 2005 has very little influence (0%) on the change management level. The parties do not apply the change management procedure in the UAC-IC 2005, because it is too circuitous and onerous for the small size and the short duration of the project. On the other projects, the standard form of contract is quite important for the change management process, because the change management procedures used on the projects are mostly based on the ones in the contracts. The change management procedures in the contracts are quite effective and are tailored to each project by adding and omitting steps. So the contract has neither little nor much influence (about 50%) on the change management level. On the Forres project, the contract has a bit more influence (about 75%) on the change management process, because some of the risk management clauses in the contract which are closely related to change management were actually applied and were quite effective on the project (e.g. the pain/gain share mechanism, the open book requirement). The risk management procedure and the mutual early warning obligation were also effective, but they were only partly based on the NEC2 ECC. In general, it can be concluded that the standard form of contract has much influence on the change management level and that it is quite fundamental for creating an efficient and effective change management process. The amount of influence increases as more risk management clauses which can be used to identify variations early on are included in the contract.

The findings regarding the influence of trust on the change management process on the projects are discussed in the next sub section. During the data analysis, some direct and indirect links between trust and the change management process could be derived from the assessment data. In addition, data was collected by means of asking the interviewees the following question: *irrespective of the project, how much influence does trust between the Employer and the Contractor have on the efficiency and the effectiveness of the change management process?* A five-point scale was applied: 0% = very little influence, 25% = little influence, 50% = neither little nor much influence, 75% = much influence, and 100% = very much influence. Even though the question was irrespective of the projects, many answers given seem to be applicable to the projects as well as they correspond quite well with the links between trust and change management found in the assessment data. An example, the findings for project Dikkowita can be seen in the table below.

Table 17: The influence of trust on the change management process on project Dikkowita

Indirectly influenced by trust (Trust is needed to...)
Apply the CM procedure correctly
Align the CM objectives
Agree on the risk allocation
Directly influenced by trust (If there is distrust...)
No co-operation and difficult to make compromises > inefficient change management process > 'like it or lump it approach'
Less profit than expected > more unreasonable and unreasonably priced variations and claims to generate profit
Doubts about the Engineer's dual role (i.e. as a certifier and the employer's agent) > escalations needed
Timelines tended to drift a little after the initial notification because the Contractor wants to have a better overview of the full impact of the variation
According to the given answers (If there is trust...)
Average score by the interviewees: 75% of the efficiency is influenced by trust
1/2 Efficiency: less time needed to check the variation and its impact.
1/2 Efficiency: the parties are willing to co-operate
Average score by the interviewees: 50% of the effectiveness is influenced by trust
1/2 Effectiveness: easier to achieve a higher goal due to collaboration (i.e. co-operation and thinking along).
1/2 Effectiveness: is also influenced by the efficiency, as this is often an objective as well due to a maximum budget.

Comparative analysis (SQ6)

The objective of this sub question is to validate the assessment results of the case study projects by means of comparing them in order to determine why and how much the efficiency and the effectiveness of the change management process are influenced by mutual trust between the Employer and the Contractor, to determine which aspects are fundamental for building trust on every project, and to determine which other trust building and efficiency and effectiveness creating aspects should be applied on every project. The findings with respect to the latter two objectives are used to state recommendations for the UAC-IC 2005 regarding an efficient and effective change management process based on trust. The case study results were compared by means of different analytic tactics in order to achieve the objectives. The first objective was achieved by comparing the results from every project in terms of influence trust on the change management process, the second by

comparing the decisive aspects from every project per cluster (i.e. procurement, contract, people, process and product) in terms of trust and distrust building, and the third by comparing all trust building and efficiency and effectiveness creating aspects from every project.

According to the interviewees, trust between the Employer and the Contractor has much influence (about 75%) on the efficiency of the change management process. Their main argument is that if there is trust, there will be no unjustified, unexpected and unreasonably priced variations. As a result, the Contractor has to submit less substantiation of the variation and the Employer does not expect to find any problems and needs less time to check the variation and its impact and there will be a quicker acceptance of the fact that it is a variation to the contract. As stated by the interviewees, trust between the Employer and the Contractor has neither little nor much influence (about 50%) on the effectiveness of the change management process. Three main arguments can be distinguished. First, if there is trust, the Contractor will more likely submit a right and verifiable change option and impact (trust based on competences and experience) and the Employer has less doubts about whether it is a right change option and whether it adds value. Second, if there is trust, the Contractor is working towards the same goal or outcome for changes, so they do not submit unjustified, unreasonable and unexpected variations. Third, if there is trust, the parties are less reluctant to agree to the variation, to believe that it is a variation to the contract, to co-operate and to deal with the variation. Further, the 'effectiveness' is also influenced by the 'efficiency', as 'a minimum use of resources' to implement a change may also be an objective of the change management process due to a maximum budget.

From the statements above can be concluded that trust has much influence (about 50-75%) on the efficiency and the effectiveness of the change management process, therefore the efficiency and the effectiveness of the change management process can be increased indirectly by means of building trust between the parties. Irrespective of the standard form of contract, there are two fundamental aspects for building trust which were derived from the comparative case study: 'a WIN-WIN situation throughout the project' and 'a clear and aligned client leadership'. These two aspects are fundamental because everything else flows from them including the efficiency and the effectiveness of the change management process (see figure below).

'A WIN-WIN situation throughout the project' should be stated as a mutual project objective and implies that the project has to be commercially viable (i.e. benefitting) for both parties throughout the project. A WIN-WIN situation may be difficult to establish due to the contradictory interests of the parties. Therefore, in order to achieve this objective, it is paramount that the parties create mutual respect and understanding for each other's interests, that the parties are satisfied with their established WIN situation, and that the parties safeguard the WIN situation for both parties throughout the project. An equitable contract between the Employer and the Contractor is important to facilitate the establishment of such WIN-WIN situation. Such contract means a fair risk allocation and a fair benefits allocation. The former implies that the risks are allocated to the party best able to manage them and that the risk owner receives an appropriate risk allowance (Meng et al., 2011). The latter implies that the benefits are proportionate to the parties' effort they are putting into the project (Khalfan et al., 2007, p. 389; Wang & Yin, 2013, p. 584).

'A clear client leadership' means that the client should have a clear and detailed vision of how they want to collaborate with the Contractor (e.g. how much involvement and collaboration) and how they want to control the project (e.g. the costs and the risks). This vision should be used to set up the procurement of the Contractor (i.e. project delivery system, type of contract, procurement procedure and award criteria) in order to find the Contractor who is best able to perform the job and who falls in line with the Employer's desired way of working the best. After the contract award, the parties have to align the client leadership jointly in order to optimize the collaboration. This 'aligned client leadership' should have a driving influence throughout the project and establish a project culture in which both parties perform to their best abilities. Therefore, the project teams have to be set up in accordance with the 'aligned client leadership'. The aligned client leadership should clearly state the way of working in terms of both parties' roles and responsibilities, the expectations of both parties, and what reasonable and fair behaviour implies on the project (by means of examples). The people on the Employer's and

the Contractor's team should be able and willing to work in that manner. Further, the parties also have to setup the joint project management systems and approaches in accordance with the 'aligned client leadership'. In this research, a number of improvements to standard project management systems were identified, which were proven to be effective for building trust or creating an efficient and effective change management process. These are included in the UAC-IC 2005 annex in the Conclusion under cluster 'process'. The project management systems and tools including these improvements will only work efficiently and effectively if there is a WIN-WIN situation and if they are jointly agreed and adjusted to the aligned client leadership.

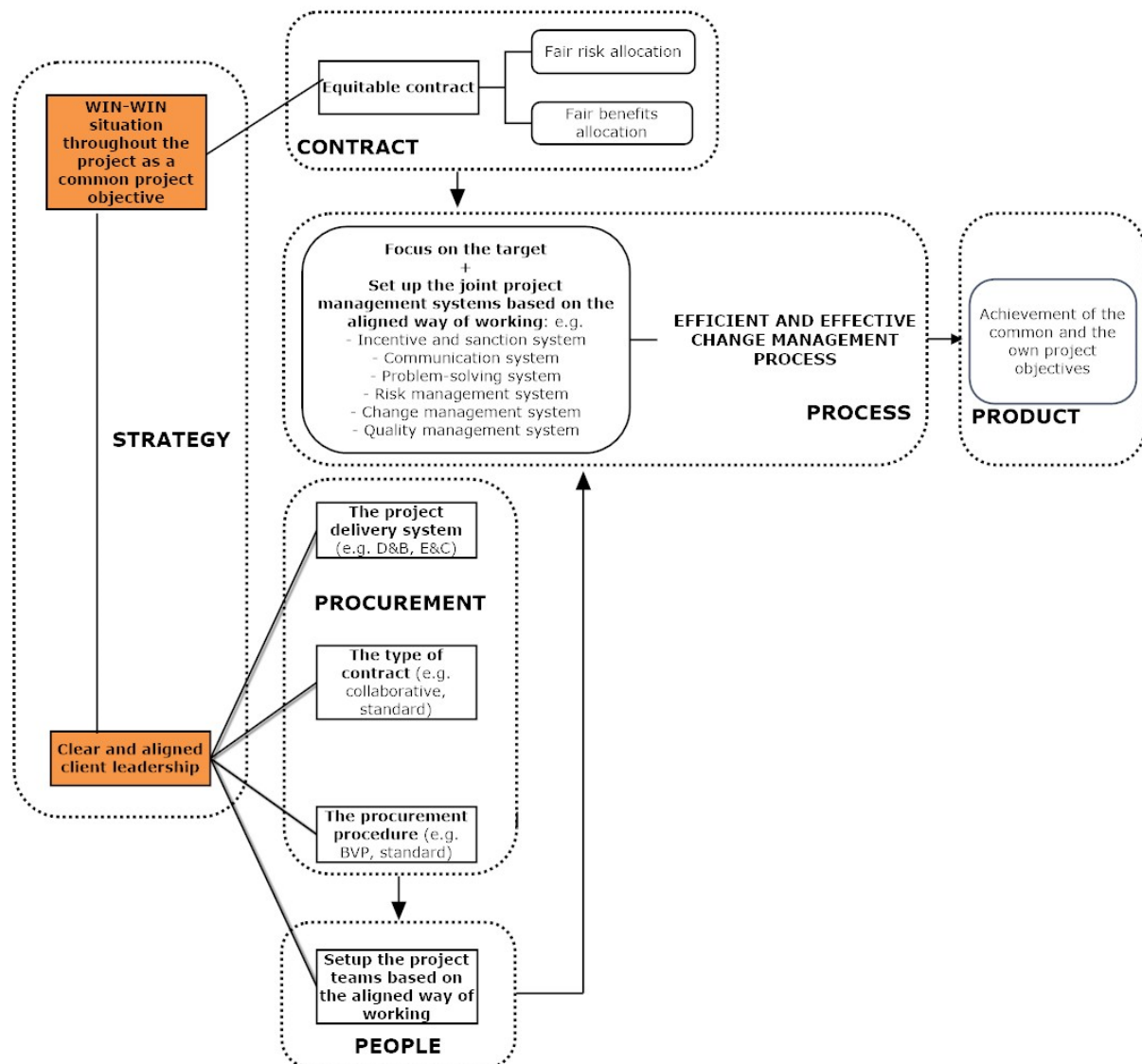


Figure 6: How to create an efficient and effective change management process based on trust

Conclusion

Trust between the Employer and the Contractor has much influence (about 75%) on the efficiency of the change management process and it has neither little nor much influence (about 50%) on the effectiveness of the change management process. Therefore, the efficiency and the effectiveness of the change management process can be increased indirectly by means of building trust between the parties. A high trust level between the parties forms a good basis for an efficient and effective change management process.

Recommendations regarding the creation of an efficient and effective change management process based on trust for projects using the UAC-IC 2005 are given in the form of an annex which could be added to the UAC-IC 2005 (see table below). The recommendations are categorized by means of clusters (i.e. strategy, procurement,

contract, people, process and product) and consists of the trust building and the efficiency and effectiveness creating aspects which were found by means of comparing the case study project. Two fundamental aspects for building trust were identified and included in the cluster 'strategy': 'a WIN-WIN situation throughout the project' and 'a clear and aligned client leadership'. These two aspects are fundamental because everything else flows from them and everything else (including the change management process) will not work as efficient and effective without them.

As the UAC-IC 2005 did not have much influence on the trust levels in both UAC-IC 2005 case study projects and do not contain many project management systems and tools, it was decided to create a general and clear overview of how to build an efficient and effective change management process based on trust, as it is not a matter of adding one or two things to achieve that because the recommendations are closely linked and need to be seen as a whole. Therefore, some recommendations may already be included in the UAC-IC 2005 or in the documents and laws directly related to this contract. The **BOLD** aspects in the annex indicate that they are already fully or partly covered by such provisions, these aspects are commented in the table as well. The second column indicates to which existing clauses the recommendations are applicable.

The recommendations in the annex are stated as aspirations, because it is not useful to define these in the standard form of contract as they are dependent on the 'client leadership' and need to be tailored to each project. Aspirations show how the author would want them to be developed and work on the project. The possible improvements to the standard project management systems are also stated in the annex in cluster 'process'. The elaboration of all aspects in the annex can be found in chapter 8. The *ITALIC* aspects in the annex indicate that they were derived from either the NEC3 ECC or the FIDIC YB.

Table 18: Annex to the UAC-IC 2005 for creating an efficient and effective change management process based on trust

STRATEGY	§3	1. Prior to the procurement of the Contractor, the Employer has to determine the client leadership, which implies creating a clear and detailed vision of how they want to collaborate with the Contractor and how they want to control the project. This client leadership should be used to set up the procurement of the Contractor.
	§3 + §4	2. After the contract award, the Employer and the Contractor have to align the client leadership jointly in order to optimize the collaboration. This aligned client leadership should have a driving influence throughout the project and establish a project culture in which both parties perform to their best abilities.
	§3 + §4 + Art. 6:2 and Art. 6:248 in the DCC + Art. 2 Basic Contract + All risk clauses (§13, §41, §44 etc.)	3. State 'a WIN-WIN situation throughout the project' as a mutual project objective. This objective should be realistic and achievable. The following is paramount in order to achieve this objective: a. the parties have to create mutual respect and understanding for each other's interests on the project b. the parties are satisfied with their established WIN situation - in case of a negotiated contract, the parties can establish a WIN-WIN situation by means of a formal joint goal setting workshop - in case of a non-negotiated contract, the Employer and the Contractor can establish their WIN situation directly by means of the Employer's Requirements and the tender respectively, but the Employer also has to facilitate a WIN situation for the Contractor during procurement by means of not applying a lowest price procedure and drawing up an equitable contract. c. the parties safeguard the WIN-WIN situation throughout the project
		Explanatory notes to recommendations in BOLD : o 3a. The principle of objective good faith in Art. 6:2 and Art 6:248 in the Dutch Civil Code (DCC) has the three functions of interpretation, supplementation, and correction and limitation, and it does oblige the parties to take each other's reasonable interests into account. Most people are not aware that the principle is written in the DCC and if they act in good faith it is merely because it is a norm to them. The UAC-IC 2005 do not refer to the DCC with respect to good faith. Explicitly stating the principle of good faith from the DCC in the UAC-IC 2005 may make it more effective as it may instigate people to think about it and take it more into account so that it forms a better basis for building trust. However, its effectiveness depends on the people involved as words are not effective in themselves. The intention of the principle is clear, but is open to interpretation, therefore the parties should agree on what reasonable and fair behaviour implies on the project (see cluster 'people').
PROCUREMENT		4. Use the client leadership to set up the procurement of the Contractor. The following is paramount in order to select the right Contractor: a. Apply the right project delivery system (e.g. D&B or E&C)
	§3 + Art. 5 Basic Contract	b. Apply the right type of contract (e.g. standard or collaborative)
	§3	c. Apply the right procurement procedure (e.g. standard, BVP or competitive dialogue): one in which the Employer can assess which Contractor is best able to perform the job and falls in line with the Employer's desired way of working the best.
	§3 + Public Works Procurement Regulations 2012 + Procurement Act 2012	d. Apply the right award criteria: always apply the MEAT award criterion (i.e. price and quality) at the least instead of going for the lowest price tender. e. Assess whether the Contractor has the right people to perform the job: request CV's of key people of the project implementation team, talk to referees and involve these key people in the tender phase
		Explanatory notes to recommendations in BOLD : o 4a. In Art. 5 in the Basic Contract, the Employer has to indicate what the Employer's Requirements consist of (e.g. the conceptual design and the preliminary design) and what design work the Contractor has to perform (e.g. developing the

		conceptual design and the preliminary design into a basic design and a final design). Employers should take into account that choosing the project delivery system requires more than thinking about the amount of design work for the Contractor as it also requires them to think about how they want to collaborate with the Contractor and how they want to safeguard and control the design. 4c. Article 7 in the Directive 2004/18/EC lays down the size limits for public contracts to determine whether they have to be put out to European tender or not (Chao-Duivis, Koning, & Ubink, 2013, p. 138; Pianoo, 2014b). The Public Works Procurement Regulations (in Dutch: Aanbestedingsreglement Werken) 2012 sets out several procurement procedures including restrictions to them for both European and National tenders which clients may apply (Doornbos, Oehler, & Gribnau, 2013, pp. 220-224). 4d. Pursuant to Art. 2.114 in the Procurement Act 2012, in principle, the Most Economically Advantageous Tender (MEAT) award criterion has to be applied to all procurements (i.e. above and below the European tender limits). The contracting authority may apply the lowest price criterion if they have valid reasons to do so and state them in the tender documents. The contracting authority is free to choose the other award criteria besides the price in as far as they are related and proportionate to the contract that is being awarded and are transparent, objective and unambiguous. They are also free to choose the assessment method for the award criteria in as far as the assessment method is proportionate to the contract that is being awarded and does not lead to a lowest price tender in the end (Pianoo, 2014c, 2015).
CONTRACT	§3 + Procurement Act 2012 Art. 2 Basic Contract	5. Draw up an equitable contract in terms of allocating the benefits and the risks fairly. The following is paramount in order to achieve this: a. Do not apply a lowest price tender, but use the MEAT award criterion (price and quality) at the least. b. Proportionate the benefits to the parties' effort they are putting into the project (e.g. a proportionate contract price, profit and risk allowance for the Contractor). c. Do not amend the contract unilaterally to the disadvantage of the Contractor, but negotiate the contract or do not make amendments to the standard form of contract at all. d. Allocate the risks to the party best able to manage them in case of a project-specific risk allocation
	§3 + Procurement Act 2012 All risk clauses (§13, §41, §44 etc.) + Procurement Act 2012	Explanatory notes to recommendations in BOLD : 5a. See remark on 4d. 5c. According to Instruction 3.9C in (Schrijfgroep Gids Proportionaliteit, 2013, p. 53) to Art. 1.10 sub section 2 in the Procurement Act 2012, the contracting authority has to use existing, jointly prepared General Terms and Conditions (GTC) for a certain project delivery system as the conditions are balanced for both the contracting authority and the tenderer in such GTC. In particular cases, it may be necessary to deviate from such GTC, but deviations should always be clearly motivated. 5d. According to Instruction 3.9A in (Schrijfgroep Gids Proportionaliteit, 2013, p. 52) to Art. 1.10 sub section 2 in the Procurement Act 2012, the contracting authority has to allocate the risks to the party best able to manage or to influence them.
PEOPLE	§3 + §4 + Art. 6:2 and Art. 6:248 in the DCC	6. The aligned client leadership should clearly state the way of working in terms of both parties' roles and responsibilities, the expectations of both parties, and what reasonable and fair behaviour implies on the project (by means of examples).
	§2	7. Select the right people: the Employer's and the Contractor's team consists of people who are able and willing to work in accordance with the aligned client leadership.
	§3 + §4 + Art. 6:2 + Art. 6:248 DCC	8. Act reasonable and fair towards the other party at all levels between the project teams and throughout the project.
	§2 + §14.1 + §15	9. Oblige a party to request the other party's approval for replacements of the key people (i.e. the representatives and team leaders) in their project team.
		10. Allow both parties to request the other party to remove an employee from the project in case he is not acting in accordance with the aligned client leadership.
		Explanatory notes to recommendations in BOLD : 6. See remark on 3a. 8. See remark on 3a. 9. §2 in the UAC-IC 2005 only requires the Contractor to request an acknowledgement by the Employer by means of the acknowledgement procedure in §23 for their representative with respect to the works and the maintenance works and their substitute for him. 10. Pursuant to §14.1, the Employer may only instruct the Contractor to remove their representatives from the project, but not any member of their team.
PROCESS	§3 + §4	11. Jointly setup the project management systems and approaches in accordance with the aligned client leadership. The parties should streamline and tailor them to the project, which also applies to existing project management systems in the standard form of contract. Examples of essential standard project management systems are given below and examples of improvements to these systems are given between brackets.
	Art. 16 Basic Contract + §36	a. A clearly defined incentive and sanction system , can only be aligned in case of a negotiated contract (incentives, such as bonuses and a <i>pain/gain share mechanism</i> are more effective than sanctions to create focus on the target in terms of costs and programme, but they have to be proportionate to the contract price)
	§3 + §4	b. A clearly defined formal communication system (in case of a communication overload, prioritize communication and/or agree on the submission dates beforehand)
	§3 + §4	c. A clearly defined informal communication system (informal communication at all levels between the project teams, preferably on a day-to-day basis by means of a fulltime co-location)
	§44	d. A clearly defined risk management system and roles therein (joint risk workshop to identify, discuss and allocate project-specific risks fairly, align the risk management approach between the parties, separate joint risk review meetings, manage the Employer's risks jointly)
	§14 + §15 + §45 +	e. A clearly defined problem-solving system (align the extent to which the parties collaborate and help each other and with regard to which aspects to resolve problems, formal and informal <i>mutual early warning for risks</i> , formal and informal <i>early warning meeting</i> , define the escalation model jointly)
		f. A clearly defined claims system (<i>open book regarding the Contractor's cost data</i> , involve an independent cost consultant to draw up the quotation, only include the direct costs of the works in the claim and reimburse the indirect costs separately)
		g. A clearly defined change management system and roles therein (quick informal decision-making in case it is beneficial to both parties that the variation is implemented prior to the paperwork, align the change management approach between the parties, <i>open book regarding the Contractor's cost data</i> , involve an independent cost

	§4.7 + §20.4 + §21.10 + §22.3 + §28.1	consultant to draw up the quotation, only include the direct costs of the works in the claim and reimburse the indirect costs separately, <i>mutual early warning for variations due to risks and ambiguities in contract documents</i> , separate formal variations meeting, jointly discuss potential variations prior to the formal procedure)
	§3 + §4	h. A clearly defined relationship management system (fulltime co-location, informal or social events, Project Follow Up workshops, team building workshops, interventions by the parties' Project Directors)
	§19-23	i. A clearly defined quality management system (take into account variations due to uncorrectable deviations)
		Explanatory notes to recommendations in BOLD : 11a. The UAC-IC 2005 merely contains a possibility to give bonuses and fines with respect to the programme. 11f. The cost compensation and/or extensions of time due to Contractor's claims are dealt with in §44. The improvements given between brackets may speed up the claims process. 11g. The change management procedure is dealt with in §14, §15 and §45. The improvements given between brackets may make the change management process more efficient and effective. 11g. The UAC-IC 2005 do include warning obligations for the Employer and the Contractor, but these are limited to errors in documents, decisions, goods, variations and so on, and are not meant to warn for any risks directly. The Employer's warning obligation is not comparable to the Contractor's as the Employer's warning obligation is only applicable to errors which they actually discovered or should have discovered, and not to obvious errors. Further, the warning obligations are not directly linked to variations, therefore they are not used to identify potential variations early on. 11i. The quality management system is dealt with in §19-23. With respect to change management, the parties should take into account that many variations may arise due to uncorrectable deviations to the Employer's Requirements.
PRODUCT	§3 + §4	12. Clearly state in the Employer's Requirements what the Employer needs and what 'fitness for purpose of the works' means according to them.
	§3 + §4	13. Create other realistic and achievable mutual project objectives besides 'fitness for purpose of the works' and 'a WIN-WIN situation throughout the project' which are superior to the parties' own objectives by means a formalized joint goal setting workshop.
		Explanatory notes to recommendations in BOLD : 12. The UAC-IC 2005 do not explicitly state that the works have to be fit for purpose, but the requirement of this standard of care can be derived from sub clauses §4.1 and §4.3. The fitness for purpose requirement is often a point of contention between the parties. Following the recommendation would certainly lower the probability of contention about it.

Recommendations

The first three recommendations are related to the annex, whereas the other recommendations are related to the literature gap and the research limitations:

- The Procurement Act 2012 was not fully taken into account when drawing up the annex as procurement law was not part of the research. Therefore, it is recommended to research the compatibility of the annex with the Procurement Act 2012.
- The annex was not tested in practice, so it is recommended to test the applicability and the effectiveness of the annex on real D&B projects using the UAC-IC 2005.
- The annex was constructed as a general overview of how to create an efficient and effective change management process based on trust. Hence, the applicability and the effectiveness of the annex can also be tested on real D&B projects using other standard forms of contract.
- In this research, the number of case study projects was limited as there was one case study project for each standard form of contract. The applicability of the annex may be improved by conducting the same research with much more case study projects and more different standard forms of contract. The assessment models and the maturity models have to be reviewed for such research though.
- There was no literature with regard to change management systems specifically for D&B projects. This research has reviewed the generic change management system on construction projects in general, but the research also identified the quality management system (QMS) as a great source of variations on D&B projects as many variations stem from uncorrectable deviations. The QMS was not part of the research, therefore it is recommended to conduct more research into change management on D&B projects to create a generic change management system specifically for D&B projects.

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I. Introduction

1 Introduction

2 Research design

1. Introduction

1.1 Introduction to the research topic

In the past decade, a lot has changed in the construction industry in the Netherlands, especially in the infrastructure segment. The use of the Design & Build (D&B) project delivery system has increased since the introduction of the Uniform Administrative Conditions for Integrated Contracts 2005 (UAC-IC 2005), partly at the expense of the Design-Bid-Build (DBB) project delivery system. This increase is mainly caused by policy changes at two public organizations Rijkswaterstaat (national roads and waterways) and ProRail (railways), which are responsible for large national infrastructure projects (ProRail, 2012; Rijkswaterstaat, 2004, 2014). The DBB project delivery system has its advantages over D&B, but the disadvantages seem to be more decisive as the DBB system is known to give rise to adversarial relationships among project participants (Pishdad-Bozorgi & De la Garza, 2012, pp. 21-22). The core problems in the Dutch construction industry which cause this undesirable situation are the fragmentation in combination with the lack of coordination and the strategies of the contractors which were focused on reducing competition (Noorderhaven, Molier, Van Oijen, & Rietberg, 2006, pp. 22-31, 42-44). By switching to D&B, these two core problems are solved to a large extent in terms of the relationship between the client and the contractor (Pishdad-Bozorgi & De la Garza, 2012, pp. 21-22). The focus of this research is on an existing problem on DBB projects, which is an inefficient and ineffective change management process. It was felt by Royal HaskoningDHV that this problem was still not resolved on D&B projects and that it was mainly caused by distrust between the client and the contractor due to the lack of transparency about both parties' intentions and the lack of sharing relevant information. Such problem may eventually lead to time and cost overruns of the project. Compared to DBB, the impact of an inefficient and ineffective change management process may be much bigger on D&B projects due to the overlap of the design phase and construction phase. Some important consequences of this overlap are that it is more difficult to estimate the value of the variations since the design is not 100% complete, the costs of variations increase much faster over time, the ability to change the design decreases much faster over time and there is a higher probability of disruptions in the construction process (Koch et al., 2010, p. 197).

The objective of the research is to determine to what extent mutual trust between the client and the contractor influences the efficiency and the effectiveness of the change management process on complex D&B infrastructure projects in order to provide recommendations for mutual trust on such projects in the Netherlands which could be added to the UAC-IC 2005 in the form of an annex. In order to achieve this objective, the UAC-IC 2005 was compared to two other D&B standard forms of contract, the FIDIC Yellow Book and the NEC3 ECC, to see whether there are aspects related to trust and the change management process which can be derived from them. The FIDIC's conditions of contract are known as very rigid contracts which are likely to lead to confrontations between client and contractor, whereas the NEC family of contracts are well known for encouraging an open, co-operative, no-blame, non-adversarial team approach (Potts, 2008, pp. 258-259, 247-248). More details about the delineation of the research and the research project context can be found in Appendices 4 and 5.

1.2 The current state of research and the literature gap

An initial literature study showed that a lot of the knowledge with respect to building trust, change management, and the standard forms of contract was already available, this study was further elaborated in chapters 3 and 4. However, there was still a literature gap with regard to the research topic:

- First, there was a lot of literature on trust in general and how to build trust in construction projects in general and in partnering projects (see chapter 3), but there was little knowledge about trust building on non-partnering D&B projects.
- Second, there was much literature on changes and change management in construction projects in general (see chapter 4), but not much knowledge about change management specifically for D&B projects.
- Third, there was a lot of literature on partnering in the construction industry, its conditions and joint activities and processes (see chapter 3). Mutual trust is considered as a critical success factor in partnering projects and a higher level

of trust would improve the overall project performance (Kadefors, 2004, p. 175; Wong et al., 2008, p. 822), but it was not clear how much trust is actually needed in order to achieve that without entering into a complete partnership (i.e. on non-partnering D&B projects) and to what extent trust has influence on the efficiency and the effectiveness of the change management process specifically.

- Fourth, there was a lot of knowledge about the three standard forms of contract in the form of the contracts themselves, the explanatory notes to them, books, scientific articles, magazines etc. (see chapter 6), but there was not much literature in terms of how much these contracts facilitate trust and change management and how effective these contracts are in doing that.

1.3 Problem formulation and research questions

The following proposition (PP) and research question (RQ) and sub questions (SQ) were formulated for this research in order to achieve the research objective and to contribute in filling up the literature gap:

PP: The inefficiency and the ineffectiveness of the change management process on D&B projects is mainly caused by distrust between the client and the contractor.

RQ: To what extent does mutual trust between the client and the contractor influence the efficiency and the effectiveness of the change management process on complex D&B infrastructure projects, and which aspects can be derived from the comparison between the UAC-IC 2005 and the NEC3 ECC and the FIDIC Yellow Book to create an efficient and effective change management process based on mutual trust for such projects using the UAC-IC 2005?

- SQ1. Which aspects are necessary according to theories on trust in order to achieve mutual trust between the client and the contractor on complex D&B infrastructure projects?
- SQ2. Which aspects are necessary according to theories on change management in order to achieve an efficient and effective change management process on complex D&B infrastructure projects?
- SQ3. Which criteria with regard to construction project management and construction contract law are relevant for assessing trust and the change management process on complex D&B infrastructure projects?
- SQ4. To what extent do the UAC-IC 2005, the NEC3 ECC and the FIDIC YB meet the set of assessment criteria?
- SQ5. To what extent do the case study projects A+B, C and D in which the UAC-IC 2005, the NEC3 ECC and the FIDIC YB were applied respectively meet the set of assessment criteria and correspond to the assessment results of question 4?
- SQ6. What can be learned by comparing the four case study results with regard to the influence of mutual trust between the client and the contractor on the efficiency and the effectiveness of the change management process on complex D&B infrastructure projects?

1.4 Outline of the research report

The report is divided into several parts, each containing at least one chapter. You are now in Part I Introduction. In the next chapter of this Part, the research design, which consists of a literature survey and a comparative case study, is described. Thereafter, Part II Literature Survey starts, which includes the chapters about theories on trust in order to achieve mutual trust between the client and the contractor (SQ1) and theories on change management in order to achieve an efficient and effective change management process (SQ2). Part III Case study setup deals with the preparations for the comparative case study. The first chapter discusses the assessment models for trust and change management which were created on the basis of the literature survey (SQ3). In the second chapter, these assessment models were used to evaluate the UAC-IC 2005, the NEC3 ECC and the FIDIC YB with respect to trust and change management (SQ4). Each standard form of contract is discussed separately. In Part IV Comparative case study, the assessment findings of SQ4 created focus when browsing through the project records and were used to draw up the interview questions. The first chapter describes the most decisive trust building and efficiency and effectiveness creating aspects for each case study project separately (SQ5). The findings of the case study projects were compared and discussed in the second chapter (SQ6). This Part concludes with the Discussion. Part V encompasses the conclusions and the recommendations of the research.

2. Research design

2.1 Overview of the research design

The research design consists of two research strategies: the literature survey and the comparative case study. The figure below shows the research strategies and the sub questions associated to them. In general, each sub question functions as input for the next sub questions and in the end, all sub questions together serve as input for the main research question.

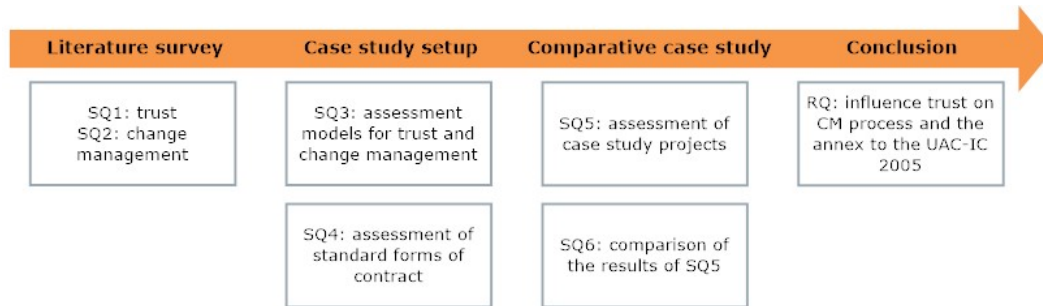


Figure 7: Overview of the research design

The research design is as follows: the literature survey on mutual trust between the client and the contractor (SQ1) and on efficient and effective change management (SQ2) based on the consultation of relevant literature yielded the assessment criteria and the assessment models for trust and change management (SQ3), by means of which the UAC-IC 2005, NEC3 ECC and FIDIC yellow book were evaluated based on the consultation of the standard forms of contract and relevant literature (SQ4). Subsequently, based on these assessments a case study of a complex D&B project was conducted for each standard form of construction contract by means of project records studies and face-to-face interviews (SQ5) to validate the effectiveness of the contract clauses found in SQ4 in practice and to identify other trust building and efficiency and effectiveness creating aspects. A comparison of the results of these case studies concluded with determining the influence of mutual trust between the client and the contractor on the efficiency and the effectiveness of the change management process in these complex D&B infrastructure projects, and with providing general recommendations in terms of this aspect (SQ6). The answer to the main research question is generalized from the answer to SQ6, but the recommendations are for the UAC-IC 2005 specifically.

2.2 Research strategy 1: Literature survey

The first two sub questions were carried out to map out the latest theories pertaining to creating and maintaining mutual trust and to an efficient and effective change management process respectively, in order to define criteria for the assessment model of SQ3. Therefore, it was chosen to answer these two questions with a desk research, which is ‘a strategy in which the researcher does not gather empirical data herself, but uses material produced by others’. The characteristics of desk research are the use and reflection of existing material, no direct contact with the research object, and the use of the material from a different perspective (Verschuren & Doorewaard, 2010, p. 194). The variant of desk research which was opted for is the literature survey, since the existing material does not consist of secondary data, but only of books, articles, conference proceedings etc. The table below gives an overview of the research material which was used to answer these two sub questions. The internet was used to find literature related to mutual trust and change management. Subsequently, a quick scan through the content of the literature took place, which led to a content analysis or to new sources.

Table 19: Research material for SQ1-2

Research strategy	SQ	Research object	Sources of information	Accessing
Desk research – Literature survey	1	Trust	1. The media – The internet	1. Search method
	2	Change management	2. Literature – Books, Scientific articles, Conference papers	2. Search method, Content analysis

2.3 Research strategy 2: Comparative case study

The comparative case study in combination with the hierarchic method was chosen to be the research strategy for the other sub questions. This is a strategy in which the researcher first tries to gain a profound and full insight into several interrelated objects or processes that are confined in time and space independently from each other, and subsequently tries to compare these to find explanations for similarities and differences. Table 20 shows that the characteristics of a case study matches well with the requirements to achieve the research objective (Verschuren & Doorewaard, 2010, pp. 178-184).

Table 20: Characteristics of a case study versus Requirements to achieve the research objective based on (Verschuren & Doorewaard, 2010, pp. 178-184)

Characteristics of a case study	Requirements to achieve the research objective
A small domain	Only three different standard forms of contract and three projects in which these contracts were applied. One project was added as a pilot case study project.
Intensive data generation	Triangulation of methods and sources by combining the content analysis of the project records with individual semi-structured face-to-face/written interviews with people involved in the projects who are representing different parties (see section 7.1)
More depth than breadth	A thorough investigation of one specific aspect in the construction contracts (the influence of trust on the change management process) by triangulation of methods and sources.
A selective sample	One complex D&B project for each standard form of contract was chosen. The selection of the projects was dependent on several criteria (see section 7.1)
An assertion concerning the object as a whole	Gaining an overall picture of the influence of mutual trust between the client and the contractor on the efficiency and the effectiveness of the change management process on complex D&B projects.
An open observation on site	The research was empirical because the experiences of the people involved were most likely not documented, therefore it was needed to gather data by talking to them. The individual semi-structured face-to-face/written interviews with the people involved in the projects took place at the office or by email. Three out of the four construction sites were visited.
Qualitative data and research methods	As mutual trust and efficiency and effectiveness of a process are difficult to quantify, a qualitative research was more applicable.

The table below gives an overview of the research material which were used to answer sub questions 3-6. The setup of the assessment of the standards forms of contract, the setup of the assessment of the case study projects, and the setup of the comparative analysis are described in more detail in chapters 6, 7 and 8 respectively.

Table 21: Research material for SQ3-6

Research strategy	SQ	Research object	Sources of information	Accessing
Case study – Setup	3	Assessment model for trust and change management	SQ1-2	
	4.1	UAC-IC 2005	SQ3	
	4.2	NEC3 ECC	1. The media – The internet	1. Search method
	4.3	FIDIC Yellow Book	2. Literature – Books, Scientific articles, Conference papers	2. Search method, Content analysis
Case study – Comparative case study	5.1	Project Bijlmerweide, The Netherlands	SQ3-4	1. Search method
	5.2	Project Drachtsterweg, The Netherlands	1. The media – The internet	2. Content analysis
	5.3	Project Forres FAS, Scotland	2. Project records	3. Questioning – Individual semi-structured interview (face-to-face/ written)
	5.4	Project Dikkowita Fishery Harbour, Sri Lanka	3. Individual people	
	6	The case study results	SQ4-5	

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II. Literature survey

3 Building trust between the client and the contractor on complex D&B infrastructure projects

4 Creating an efficient and effective change management process on complex D&B infrastructure projects

3. Building trust between the client and the contractor on complex D&B infrastructure projects

This chapter deals with the first sub question: Which aspects are necessary according to theories on trust in order to achieve mutual trust between the client and the contractor on complex D&B infrastructure projects? The objectives of this sub question are to research what trust actually means in the context of the construction industry, to research methods to measure trust and to identify aspects which are important for creating and maintaining trust between the client and the contractor during a project. The findings were used as input for the trust assessment model (SQ3). Literature on trust in general and trust on construction projects were consulted and analysed in order to achieve these objectives. This chapter focuses on the results of the analysis.

3.1 Definitions

The following table contains definitions of terms which are related to trust. The definition of trust by (Rousseau et al., 1998, p. 395) was found in most scientific articles consulted for this literature survey. The other two definitions more or less correspond with this one.

Table 22: Definitions of trust-related aspects

Aspect	Definition	Source
Trust	'A psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another'.	(Rousseau et al., 1998, p. 395)
	'The expectation that things or people will not fail us, or the neglect or lack of awareness of the possibility of failure, even if there are perceived opportunities and incentives for such failure'.	(Nooteboom, 2002, p. 57)
	'The willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party'.	(Mayer, Davis, & Schoorman, 1995, p. 712)
Trustworthiness	'The personal state or quality of being trustworthy or reliable. Commonly regarded as a virtue'.	(Allwords.com, 2014)
Trustor	'Someone who trusts'.	(Nooteboom, 2002, p. 16)
Trustee	'Someone or something trusted'.	(Nooteboom, 2002, p. 16)
Confidence	The quality of trusting in the form of feeling of certainty.	(Allwords.com, 2014)

"Trust" is described below on the basis of these definitions and the following circumstances: person A (the trustor) trusts person B (the trustee).

(Dietz & Den Hartog, 2006, pp. 558-560) break down trust into three parts: trust as a belief (i.e. an expectation), as a decision (i.e. a willingness to be vulnerable) and as an action (i.e. a risk-taking action). According to the definitions of trust, trust is indeed a belief or a state of mind and thus an individual-level phenomenon. Such belief considers the assessment of B's trustworthiness, which is based on probabilities and feelings. Even though, trust is not a decision or an action (e.g. a certain behaviour), it could lead to these two things. Therefore, trust is not equivalent to co-operation since this is also an action. Trust does promote cooperation though, but it is not a necessary condition for cooperation (Rousseau et al., 1998, p. 395). A decision to trust follows if A considers B to be trustworthy and intends to allow himself to be subject to the risk (i.e. intention to accept vulnerability) of potentially detrimental actions on the part of B on the basis that such outcomes are unlikely (i.e. positive expectations). Subsequently, an action of trusting B follows if A engages in trust-informed risk-taking behaviour. Such behaviour usually concerns either reliance-related behaviour or the disclosure of potentially incriminating or damaging information.

There are two essential conditions for trust to arise: risk and interdependence. Risk is the perceived probability of loss as interpreted by A and it creates an opportunity for trust, which leads to risk-taking action. Hence, trust is not needed when there are no risks (i.e. complete certainty about the actions). Interdependence implies that the interests of A cannot be achieved without B. Therefore trust presupposes a relationship and a reliance on others (Rousseau et al., 1998, p. 395). According to (Jin & Yng Ling, 2005, p. 1225), risks should be counterbalanced with trust in order to achieve a successful relationship.

As stated in (Kadefors, 2004, p. 176), it is important to acknowledge that trust also has its costs: there are the direct costs for building trust, the potential costs for breach of trust and the costs of inefficiency related to excessive trust. Large and complex projects often require more trust than small and straightforward projects, since there are many more relationships (i.e. more interdependencies) and much more communication, information exchanges and interfaces between the parties (Khalfan et al., 2007, p. 389). An optimal level of trust must be created in each situation in order to achieve efficiency and not miss opportunities for improvement (Kadefors, 2004, p. 176).

3.2 Content of trust

According to (Dietz & Den Hartog, 2006, pp. 560-561 and references therein), the content of trust (i.e. the trustworthiness of the trustee) consists of four trustee's qualities:

- ability: 'the party's capability to carry out its obligations (in terms of skills and knowledge)';
- benevolence: 'benign motives and a personal degree of kindness towards the other party, and a genuine concern for their welfare';
- integrity: 'adherence to a set of principles acceptable to the other party, encompassing honesty and fair treatment, and the avoidance of hypocrisy';
- predictability (or reliability): 'the consistency and regularity of the party's behaviour'.

All four qualities are considered to be significant in themselves and are required if trust is to arise. If one of the four qualities is lacking, the trustor might make the decision not to trust the trustee. Trust can be compartmentalized though, which means that one can trust or distrust different aspects of the other party. Moreover, the four qualities seem to be interdependent and the decisiveness of the combination depends on the circumstances and the characteristics of the trustor (Dietz & Den Hartog, 2006, pp. 560-561 and references therein). The latter is elaborated in the next two sections.

3.3 Levels, types and sources of trust

The decision to trust depends not only on the characteristics of the trustee, but also on the characteristics of the trustor, on the characteristics of their relationship with each other and on broader situational constraints. Some significant characteristics of the trustor are his pre-disposition towards trusting others (i.e. generalized trust), his internalisation of nation-level cultural values and norms, and his political persuasion (Dietz & Den Hartog, 2006, pp. 561-564).

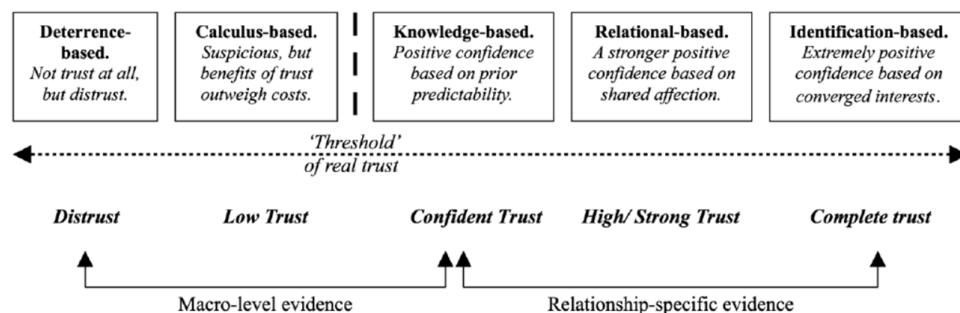


Figure 8: Types, levels and sources of trust (Dietz & Den Hartog, 2006, p. 563)

Figure 8 illustrates five levels of trust: distrust, low trust, confident trust, high/strong trust and complete trust. The first two levels are based on macro-sources, which are broader situational constraints, such as binding contractual agreements, legislative requirements or code of conducts. Macro-sources are general and impersonal. Deterrence-based trust can merely be created by threatening with external sanctions and force. Such threat guarantees the expectation of compliance, therefore trust is not actually needed. Calculus-based trust can be built by conducting a strict cost-benefit analysis. If the benefits of trust outweigh the costs of trust, one party may decide to trust the other. The trustee remains suspicious though, because this type of trust is not

based on the trustworthiness of the trustee (Dietz & Den Hartog, 2006, pp. 561-564 and references therein). In the literature, deterrence-based trust and calculus-based trust are often combined and considered to be one type of trust. The names which are given to this type are, for example, system-based trust, rule-based trust and institution-based trust (Wong et al., 2008, pp. 823, 828).

The other three levels of trust are based on micro-sources, which are relationship-specific and personal. The trustworthiness of the trustee was already discussed in the previous section and consists of certain significant characteristics: his ability, his benevolence, his integrity and his predictability (or reliability). These characteristics create knowledge-based trust (Dietz & Den Hartog, 2006, pp. 561-564 and references therein). An alternative name often found in the literature is cognition-based trust (Wong et al., 2008, pp. 823, 828). As mentioned above, a trustor may trust a trustee with regard to some aspects in certain domains, but not in other domains. Relation-based trust can be derived from the quality of the relationship over the course of time (Dietz & Den Hartog, 2006, pp. 561-564 and references therein). In the literature, alternative names for this type of trust are, for instance: affect-based trust and emotional trust (Wong et al., 2008, pp. 823, 828). The quality of the relationship can be determined by means of the maturity levels of relationships. The four types of trust discussed are almost of equal importance in trust building and are mutually dependent. Complete trust is based on converged interests and overwhelming affection. The type of trust which is related to complete trust is called identification-based trust since both parties take on a common identity (Dietz & Den Hartog, 2006, pp. 561-564 and references therein).

3.4 Trust and control

This section focuses on the relationship between trust and control and on the control over opportunism. The trustworthiness of the trustee is subjected to limits. There may be golden opportunities or other situational temptations which are decisive for the trustee for changing his behaviour, but the trustor's trust is subjected to tolerance levels for such deviant behaviour though (Laan, 2009, pp. 27-28 and references therein). Opportunism on the part of the trustee can occur in a passive or in an active form. The former comprises a lack of dedication when performing to the best of one's ability, whereas the latter comprises self-interest seeking with guile. Benevolence is the opposite of active opportunism. Control over opportunism can also occur in a passive or in an active form. Passive control consists of any instrument or condition that may mitigate relational risk, whereas active control consists of control based on power and deterrence (e.g. penalties or sanctions) (Woolthuis et al., 2005, pp. 814-816 and references therein).

Table 23: Control over opportunism (Nooteboom, 2002, p. 75; Woolthuis et al., 2005, p. 815)

	Macro, universalistic	Micro, particularistic; relation-specific
Self-interest		
Opportunity control	Contracts, legal enforcement	Hierarchy, managerial fiat
Incentive control	Reputation	Dependence: unique partner value, switching costs, hostages
Altruism		
Benevolence	Values, social norms, moral obligation, sense of duty, bonds of kinship	Empathy, identification, routinization, affect, friendship

The amount of control exercised over opportunism has a direct influence on the occurrence of opportunism or trust and vice versa. According to (Rousseau et al., 1998, p. 399), trust is not a control mechanism, but rather a substitute for control over opportunism. However, strict control may hamper the emergence of trust. Table 23 provides several reasons for the trustee to decide to dedicate himself to the relationship and to refrain from opportunism (i.e. the intention to behave in a trustworthy manner). First, there may be a limit to the opportunities for deviant behaviour due to opportunity control in the form of restricting the range of the other's actions (e.g. by means of contractual obligations and sanctions from superiors). Second, there may be a limit on the material incentives to use opportunities for deviant behaviour due to incentive control in the form of dependence on the relationship (e.g. protection of reputation with regard to future collaboration and fear of retaliation). Third, there may be a restriction on the inclination to use opportunities for deviant behaviour due to benevolence (e.g. general social values and norms and more-personalized bonds of empathy) (Laan, 2009, pp. 29-30 and references therein; Woolthuis et al., 2005, pp. 814-816 and references therein).

3.5 Trust and contract

The main topic of discussion in this sub section is the relationship between trust and contract. According to (Woolthuis et al., 2005, pp. 833-835), trust precedes contracts in general and not the other way around, because trust created by legal regulation forms a poor basis for the increasing of interpersonal care, concern and benevolence. Furthermore, they argue that trust and contract can either be a substitute for or complementary to each other depending on the reasons for drawing up the contract and the function of the contract. On the one hand, trust and contract may become complementary if the contract is not interpreted as a strict legal safeguard. On the other hand, trust may become a substitute for the contract if parties place great emphasis on the contract and include detailed safeguarding clauses because they distrust each other or, alternatively, if parties decide not to include safeguarding clauses in the contract because they trust each other. A contract can have the following functions: to safeguard the interests of both parties legally, to coordinate (i.e. to specify both parties' goals and the ways to achieve these), to safeguard for contingencies and to demonstrate both parties' commitment.

3.6 Common law versus civil law regarding good faith

Regarding this research, a striking difference between the common law and civil law systems is the principle of good faith (Fauvarque-Cosson & Mazeaud, 2008, p. 198). The principle of good faith in the law may provide a basis for building trust and opportunity control over opportunism, such control is described in sub section 3.4. In a number of legal systems, good faith does not only apply to contract law, but also to other fields of law (e.g. family law, property law, inheritance laws and company law) (Fauvarque-Cosson & Mazeaud, 2008, p. 151). Good faith is close in line with trust since it can be seen as a true standard of behaviour (Fauvarque-Cosson & Mazeaud, 2008, pp. 167-168).

Subjective versus objective good faith

A distinction can be made between subjective and objective good faith. According to (Fauvarque-Cosson & Mazeaud, 2008, p. 156; Hesselink, 2010, pp. 619-620), subjective good faith can be defined as 'a subjective state of mind: not knowing nor having to know of a certain fact or event' and aims 'to protect the mistaken belief of one contracting party to give effect to appearances', whereas objective good faith can be regarded as 'a norm for the conduct of contracting parties: acting in accordance with or contrary to good faith' and is used to 'moralize contractual relationships, and to temper the inequalities that could result from the dogma of the autonomy theory'. The general good faith clauses refer to objective good faith and to emphasize that, some legal systems adopted different wording for it (e.g. Treu und Glauben, correttezza and redelijkheid en billijkheid) (Fauvarque-Cosson & Mazeaud, 2008, pp. 196-197; Hesselink, 2010, p. 620). Objective good faith is often considered to be the highest norm of contract law, the law of obligations and all private law (Hesselink, 2010, pp. 619-620). In general, civil law systems do recognize the principle of good faith in an objective sense, whereas common law systems do not. Some common law countries do recognize subjective good faith (Fauvarque-Cosson & Mazeaud, 2008, pp. 196-198; Hesselink, 2010, pp. 619-620).

Meaning of objective good faith

According to (Fauvarque-Cosson & Mazeaud, 2008, pp. 162-163; Hesselink, 2010, p. 621), objective good faith has two different meanings. First, good faith is a criterion for interpreting a legal text, such as a contract, a treaty or a statute. Second, good faith is a moral standard, which basically implies that one should take the interests of the other party into account. To that effect, good faith is a source of obligations such as behaving honestly, sincerely, loyally and keeping one's word and promise.

Objective good faith is an open norm

Objective good faith is used as a norm, a general principle, a rule, a maxim, a duty, an obligation, a rule, a standard for conduct, a source of unwritten law, and a general clause (Hesselink, 2010, p. 622). Objective good faith is usually considered to be an open norm, which implies that it is 'a norm the content of which cannot be established in an abstract way but which depends on the circumstances of the case in which it must be applied, and which must be established through concretisation' (Fauvarque-Cosson & Mazeaud, 2008, pp. 156-157;

Hesselink, 2010, p. 622). In order to apply good faith, the court concretizes good faith by determining the requirements of good faith in the circumstances of the specific case in such an objective way as possible. In most systems, methods were developed to rationalize and to objectivize the notion of good faith without affecting its adaptability by providing judges with guidelines which are, for example, based on previous cases (Fauvarque-Cosson & Mazeaud, 2008, p. 158; Hesselink, 2010, pp. 623-624).

Functions of objective good faith

As stated in (Fauvarque-Cosson & Mazeaud, 2008, pp. 182-190; Hesselink, 2010, pp. 627, 630-631), objective good faith has three functions in most legal systems. First, concretization or interpretation. Second, supplementation, which mainly implies additional duties. Duties that often appear in legal systems are a duty of loyalty which protects the expectation interest (i.e. 'to secure performance'), a duty of care which protects the negative interest (i.e. 'to take care that the other party and their property do not suffer any damage during the performance'), a duty to co-operate and a duty to inform. Third, correction or limitation. This function prohibits abuse of right and excessive disproportion. Therefore, agreements between parties may comprise more than what is written in the contracts.

3.7 Views on trust per culture

The case study contains projects which are carried out in different cultures (see sub section 7.1). Trust may be perceived differently per culture, therefore it is important to take culture into account in this research. Various authors (e.g. Hofstede, Inglehart, Trompenaars, and Triandis) have created cultural dimensions in order to understand cultural differences. For this research, Hofstede's set of cultural dimensions was used, because it is the most complete set compared to the other ones and Hofstede also provides scores per country (Maleki & de Jong, 2013, p. 25). The six cultural dimensions are Masculinity versus Femininity (MAS), Individualism versus Collectivism (IDV), Power Distance Index (PDI), Uncertainty Avoidance Index (UAI), Long-Term Orientation versus Short-Term Normative Orientation (LTO), and Indulgence versus Restraint (IND). (Hofstede, Hofstede, & Minkov, 2010) describe in their book what the key differences are between the two extremes per cultural dimension with regard to various aspects (e.g. family, school, health care, the workplace, politics and religion). In his research into the consequences of culture for trade, (Verwaart, 2011) describes such key differences regarding trade and trust, which are also very much applicable to business deals between clients and contractors in the construction industry. The explanation of Hofstede's cultural dimensions, the main differences and other differences between the two extremes regarding trust can be found in Appendix 6. The most important cultural dimension for this research is Masculinity versus Femininity (MAS). This dimension is also called the performance-co-operation orientation index. With regard to trust, there are some essential differences between the two extremes. In masculine/performance oriented cultures, parties do business with anyone, focus is on performance, trust implies enforceable trust (i.e. trust in good performance that is backed up by the option of rewarding and punishing the trustee), implicit trust is low and if you get cheated upon it is your own fault and you are a loser. Whereas in feminine/co-operation oriented cultures, building relationships is important, focus is on good intentions rather than on performance, trust implies intrinsic trust (i.e. trust that accepts vulnerability), implicit trust is high and cheaters are looked down upon (Hofstede et al., 2010, pp. 155, 170, 180; Verwaart, 2011, pp. 18, 90-91).

(De Ridder, 2013, pp. 10-12) argues that the priorities of organizations in different cultures are dissimilar (see table below)

Table 24: The priorities of organizations in different cultures adapted from (De Ridder, 2013, pp. 10-12)

	Anglo Saxon culture (e.g. UK, US)	Rhineland culture (prevailing in Europe)	Asian culture
1	Legal	Organisation	Relations
2	Organisation	Relations	Organisation
3	Relations	Legal	Legal

3.8 The dynamics of a trust relationship

This sub section deals with the trust level between the client and the contractor during the project. (Wang & Yin, 2013, pp. 581-585) make a distinction between initial trust and trust during project implementation (Figure 9). Building trust in a project is very difficult since the project organization is temporary, the client's and the contractor's interests are divergent and the time span is limited, but according to (Jin & Yng Ling, 2005, pp. 1224-1225; Kadefors, 2004, p. 181) it is not impossible. Therefore, building initial trust seems to be crucial to the relationship between the client and the contractor to form a basis for trust during project implementation.

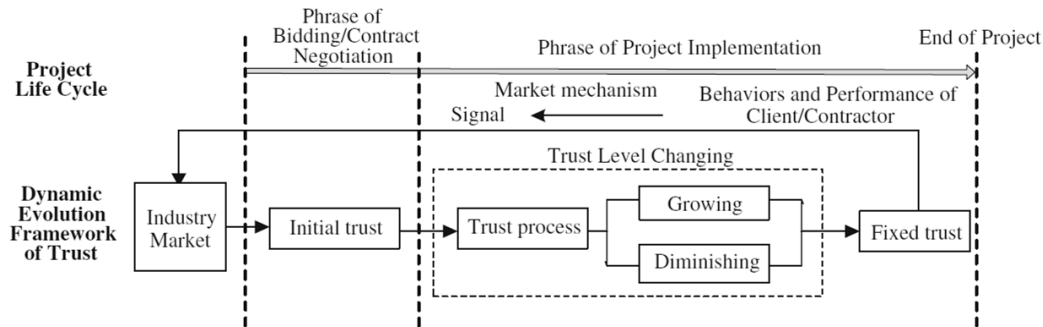


Figure 9: Dynamics of trust relationship in project (Wang & Yin, 2013, p. 582)

The factors influencing the development of the trust relationship in the project are discussed in detail in the next sub section. Past co-operation is most likely to have a positive influence on the relationship since one may expect that parties are only willing to cooperate again if past cooperation was successful. Initial trust can be created at the bidding and contract negotiation phase and is based on, for example, the trustworthiness of the parties and the contract terms. During project implementation, the trust relationship between the client and the contractor is dynamic and could either grow or diminish depending on how the parties deal with certain factors such as communication and problem-solving. At the end of the project, the trust level becomes fixed. The behaviours and performance of the client and the contractor will have an influence on their trustworthiness in future projects (Wang & Yin, 2013, pp. 581-585). Therefore, the prospect of future cooperation may also influence the trust relationship during the project

According to (Jin & Yng Ling, 2005, pp. 1224-1225), the maturity level of the relationship depends on the project phase and is enhanced during the project: shallow dependence (the pre-bidding phase), deep dependence (the bidding phase) and shallow interdependence (the construction phase and post-construction phase). The maturity level may even upgrade to deep interdependence in the post-construction phase if the parties continue their collaboration in another project. Trust should be viewed as a counterbalance to risks (e.g. breach of contract, incompetence, disputes) in order to develop the relationship smoothly and to achieve a successful relationship. The maximum amount of risk appears at the end of the project since risks are cumulative. Therefore, if trust is used to counterbalance the risks, then at the end of the project the amount of trust should be at its maximum as well.

3.9 Components for building trust

In the literature, there were many scientific articles about building trust in general in construction projects, in partnering projects, between supply chain participants and so on, but there was no literature with regard to building trust on non-partnering D&B projects specifically. Therefore, the author decided to use a mix of the different articles. Five different articles were analysed and compared with regard to the components of trust (see Appendix 7): (Wong et al., 2008) aim at developing a trust framework in construction contracting, (Khalfan et al., 2007) focus on building trust among supply chain participants working on construction projects, (Kadefors, 2004) focuses on the client-contractor relationship on project partnering construction projects, (Jin & Yng Ling, 2005) aim at developing a theoretical framework to explain trust-based partnering relationships in China's

construction industry, and (Wang & Yin, 2013) aim at creating a fundamental analytic framework of trust mechanism between the client and the contractor in construction projects. Such components consist of joint activities and processes that can build and sustain trust between the client and the contractor. The components which appeared in multiple sources are considered to be crucial. These were selected and are briefly described below. A distinction was made between the components for building initial trust at the start of the project (including the tender phase) and the components for building and sustaining trust during project implementation.

The components for building initial trust at the start of the project (including the tender phase)

Seek a party with a good track record, reputation and competence in financial and risk management

According to (Wang & Yin, 2013, p. 582; Wong et al., 2008, pp. 823-824), knowledge of a party's track record (past performance), reputation and professional standing are important indicators of his trustworthiness as they reveal the consistency, competence, and integrity of the party. For the contractor, the track record and reputation are valuable assets as they are often directly related to the quality of the construction projects which the contractor has carried out. The client's reputation may be important to the contractor with regard to, for example, payments. A party with a healthy financial status may be perceived to be more trustworthy because it reflects a party's capability to facilitate and enhance economic processes. Moreover, the risk that the party will try to make a profit by issuing unreasonable claims is lower. In such cases a party with a high level of risk management may have a competitive advantage as risk management has a significant influence over project success

Seek a party with a similar culture/policy

According to (Khalfan et al., 2007, p. 388; Wong et al., 2008, p. 822), a party's policy specifies priorities, defines the business procedures and reflects the expected behaviour of its staff and the trust they have in their organization. The upper management often dictates the expected behaviour of the staff. A shared culture with similar norms and values between these parties can enhance the commitment and consistency of individual behaviour (Jin & Yng Ling, 2005, p. 1230).

Joint goal setting (e.g. by means of formalized team building workshops)

The process of joint goal setting can take place in a workshop, which usually also includes team building processes. During the workshop, the goal is to establish mutual objectives and mutual understanding of each other's project roles. Mutual objectives implies that all parties will work on the project in order to achieve the same overall project goals, while their own project goals are subordinate to them (Kadefors, 2004, pp. 180-181; Khalfan et al., 2007, p. 387). In order to find and to establish mutual objectives, the parties have to communicate their own project goals and the consequences of these goals for the other parties. Such communication improves mutual understanding between the parties since parties will better understand the position of the other, the difficulties the other is facing and what the other needs from them and vice versa. Explicit mutual objectives should be formulated for cost, time, quality aspects, relationships (e.g. treat each other with respect) and work processes (e.g. communication and problem solving) (Kadefors, 2004, pp. 180-181).

A clearly defined system of communication procedures and approaches

As stated in (Wang & Yin, 2013, p. 585; Wong et al., 2008, p. 822), communication systems define the channels for interaction between the various parties. A distinction can be made between close contacts (e.g. meetings and workshops) and distant contacts (e.g. emails and phone calls). A clearly defined system of communication procedures and approaches facilitates convenient and speedy communication, limits distorted interpretation and misunderstanding, and reduces the uncertainty of risks and claims

Adopt a joint problem-solving philosophy

A problem can be defined as 'a perceived gap between the existing state and a desired state, or a deviation from a norm, standard, or status quo' (BusinessDictionary.com, 2014). Thus, problems which may occur in construction

projects are, for example, different geotechnical conditions than expected, non-compliance with the Employer's requirements, and delay in construction. According to (Jin & Yng Ling, 2005, p. 1231), joint problem-solving implies that the parties work together to find an appropriate solution to the problem and it includes, for instance, exchanging opinions and joint decision-making. The goal is to resolve problems before they escalate to litigation. A system for a continuous improvement in the relationship between the parties may promote joint-problem solving as problems and conflicts can be detected early on during gatherings (Kadefors, 2004, p. 181).

Draft a clear, unambiguous and equitable contract

Contracts define the relationships, the obligations and the implicit expectations between the parties (Wong et al., 2008, pp. 822-823). According to (Khalfan et al., 2007, p. 389; Wang & Yin, 2013, p. 584), an equitable contract means that the risks and the benefits are allocated fairly and that the benefits are proportionate to the parties' effort they are putting into the project. Equitable contracts reduce opportunistic behaviour since parties do not feel the need to increase their profit, for example, by issuing claims. A clear and unambiguous contract contributes to fair risk allocation, an overall project performance improvement and to cost reduction (Wong et al., 2008, pp. 822-823).

An agreed system for achieving a continuous improvement in the relationship

Systems for achieving a continuous improvement formalize, plan and structure the relationships between the parties. Regular formal follow-up workshops should be used to evaluate the relationships and the overall project goals, and to enable cross-discipline teamwork (Kadefors, 2004, p. 181).

The components for building and sustaining trust during project implementation

Reasonable behaviour (i.e. working fairly and professionally)

Reasonable behaviour implies behaving fairly and professionally towards the other party. What is considered to be reasonable actually depends on the parties involved (Khalfan et al., 2007, p. 387).

A repeated fulfilment of communication or interaction

Repeated fulfilment of communication or interaction between the parties can be achieved by spending time together and by working together on a day-to-day basis (Khalfan et al., 2007, p. 387). Interaction allows the parties to learn about the needs and capabilities of each other, and therefore, they reduce conflict between the parties. A lack of communications increases the fear of opportunism and subsequently discourages commitment to the project team (Wong et al., 2008, p. 823).

Problem-solving to mutual satisfaction at the lower levels

The component implies that all problems should be resolved at the lowest levels by amicable agreement.

Emotional investments (e.g. by means of formalized team building workshops)

According to (Wang & Yin, 2013, p. 585; Wong et al., 2008, p. 824), an emotional investment implies spending time with, and putting energy and effort into a person in order to understand his feelings. Such investments are useful to eliminate frictions between the parties, to reduce defensiveness, unhealthy competitiveness and disruption between the parties, and to enhance the team spirit and morale

3.10 Maturity model of relationships on construction projects

There is not much literature about measuring trust and its components. (Meng et al., 2011) created a capability maturity model that focuses on the specific relationship between the customer and the supplier. This model is by far the most complete one as it covers many of the trust components. It can be used as a tool to measure the relationship between the client and the contractor in a quantitative way in order to determine the current relationship level and the aspects that should be addressed to improve the relationship. The layout of the maturity model can be seen below and includes a brief description of the main criteria. The complete maturity model can be found in Appendix 8.

Table 25: Layout of maturity model of relationships on construction projects (Meng et al., 2011, p. 100)

Main criteria	Sub criteria	Level 1: Price competition	Level 2: Quality competition	Level 3: Project partnering	Level 4: Strategic partnering/ alliance
Procurement	the procurement method and the contract used				
Objectives	the extent to which the project objectives are shared				
Trust	the sources and the amount of trust				
Collaboration	the extent to which the parties collaborate in the project				
Communication	the extent to which information is exchanged and learning is shared between the parties				
Problem solving	the extent to which the parties solve problems together				
Risk allocation	how the risk is allocated and whether there is a reward for carrying risk				
Continuous improvement	the extent to which the parties join forces to continuously improve the performance				

The maturity model comprises four maturity levels, eight main criteria, 24 sub criteria and descriptions for each sub criterion at four different maturity levels. The first two maturity levels (price competition and quality competition) represent traditional relationships, whereas the last two maturity levels (project partnering and strategic partnering) represent collaborative relationships. The first level can be characterized as an adversarial or a win-lose relationship, which is dominated by self-interest and distrust. The second level can be identified as a win-partial win relationship in which there is a limited degree of cooperation between the parties. The third level implies a partnering or a win-win relationship for one project in which the parties work collaboratively together as an integrated team. The fourth level is an upgrade of the third level since it covers partnering over a series of projects.

4. Creating an efficient and effective change management process on complex D&B infrastructure projects

This chapter deals with the second sub question: Which aspects are necessary according to theories on change management in order to achieve an efficient and effective change management process on complex D&B infrastructure projects? The objectives of this sub question are to research what change management actually means in the context of the construction industry, to research methods to measure change management and to identify aspects which are important for creating an efficient and effective change management process. The findings were used as input for the change management assessment model (SQ3). Literature on changes and change management systems on construction projects were consulted and analysed in order to achieve these objectives. The results of this analysis of trust are discussed in this chapter.

4.1 Definitions

The following table contains definitions of terms which are common in the change management process in the construction industry. These terms are also often used in construction contracts.

Table 26: Definitions of common terms in the change management process

Term	Definition	Source
Change/Variation	'An alteration or a modification to pre-existing conditions, assumptions or requirements'.	(Lazarus et al., 2001, p. 10)
Change notice	'A document issued by either the employer or contractor notifying the other party of the possible and potential changes that may be encountered'.	(Gharaee Moghaddam, 2013, p. 86)
Change instruction	'A document issued by the employer instructing the contractor to execute the changes'.	(FIDIC, 2000, p. 217)
Request for change proposal	'A document issued by the employer requesting the contractor to submit a change proposal'.	(FIDIC, 2000, p. 217)
Change proposal	'A proposed adjustment to contract price or/and time of performance in response to a change instruction, a request for change proposal or any other circumstance in which the contractor believes an adjustment to the price or performance is due'.	(Gharaee Moghaddam, 2013, p. 87)
Change request	'A document issued by contractor for initiating request for a change instruction due to some unforeseen factors such as differing site conditions, constructive events and changes'.	(Gharaee Moghaddam, 2013, p. 86)
Change order	'A document that represents the commercial and technical resolution of a contract change and describes the scope, price, schedule and method of payment for a change'.	(Gharaee Moghaddam, 2013, p. 86 and references therein)
Claim	'A request for adjusting contract terms, such as compensation, time or other reliefs, when a circumstance is different from what was originally anticipated by the parties at the time of entering into the contract'.	(Pishdad-Bozorgi & De la Garza, 2012, pp. 22-23)
Change management	'The establishment and maintenance of a project culture and systems to control and review changes to the project prior to their implementation'.	(Lazarus et al., 2001, p. 19)
Efficiency	An indicator of the resources that were consumed to reach the level of achievement and can be determined by comparing the actual efforts and the normative efforts.	(De Ridder, 2013, p. 19; Samsonowa, 2012, p. 25)
Effectiveness	An indicator of the degree of a goal attainment and can be determined by comparing the actual performance with the normative performance	(De Ridder, 2013, p. 19; Samsonowa, 2012, p. 25)

This research is focused on variations to the contract between the client and the contractor, more specifically on scope changes. Construction contracts usually contain a changes or variations clause, which for example features the rights of the parties to initiate changes, how the effects of changes should be determined and who is responsible the additional costs (ORACLE, 2009, p. 4). Figure 10 illustrates how the common terms in the change management process are related. The actual terms used in the UAC-IC 2005, the NEC3 ECC and the FIDIC YB may deviate from them and are discussed in Appendices 15, 16 and 17.

A change in a construction project eventually leads to either a claim or a change order, therefore changes and claims are closely related. The main difference between a claim and a change order is that the former is a request

to enforce the existing contract, whereas the latter is a request for a new contract and says nothing about whether the parties are living up to the existing contract.

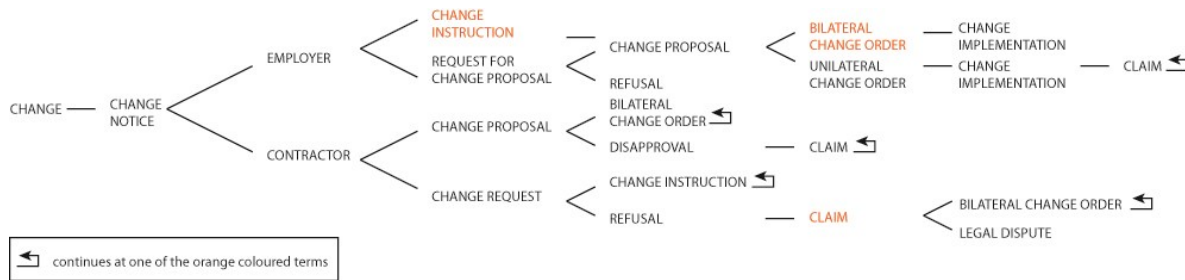


Figure 10: Relationship between common terms in the change management process

A change can be notified and initiated by either the employer or the contractor:

- The employer may instruct the contractor to execute a change with or without agreement as to feasibility, time and price. A unilateral change order is usually issued by the employer and means that there is no agreement between the employer and contractor on the price and the time. Executing such a change order could lead to claims. A bilateral change order means that there is an agreement and that the change order will be executed (Barrie & Paulson, 1991; Construction Institute, 2008). If the employer wishes to reach prior agreement on the effects of the change in order to minimize dispute, they may also request the contractor to submit a change proposal first.
- The contractor may initiate a change by submitting either a change proposal or a change request. Disapproval or refusal by the Employer could lead to claims. If a claim is resolved, it may follow the submission of a change order. Otherwise, it will likely turn into a legal dispute (Pishdad-Bozorgi & De la Garza, 2012, pp. 22-23 and references therein).

4.2 Types of changes

Variations have many classifications. Some of these are discussed in this sub section, starting with the most commonly used ones. (Ibbs et al., 2001, pp. 160-161; Lazarus et al., 2001, p. 10) distinguish beneficial changes versus detrimental changes, and elective changes versus required changes. Beneficial changes are changes which can help reduce cost, schedule, or degree of difficulty and should therefore be encouraged and supported. Detrimental changes are changes which reduce owner value and have a negative impact on a project, and should therefore be discouraged and avoided. The timing of a change often determines if the change is beneficial or detrimental. Elective changes are changes that the client can choose whether or not to implement because there may be several options that produce the desired result. Required changes are changes that the client must accept because there are no alternative options. There may be implementation or timing options though (Lazarus et al., 2001, p. 21).

(Lazarus et al., 2001, pp. 10, 20) emphasize the importance of distinguishing pre-fixity (design development) changes versus post-fixity changes since the change management process for these two types of changes is different. Aspects become fixed when they are approved by the client. Pre-fixity changes are likely to have fewer adverse impacts on the project than post-fixity changes.

(Sun et al., 2006, p. 262) consider two other classifications: gradual versus radical and anticipated versus emergent. Gradual changes are changes with usually a low intensity and which happen slowly over a prolonged period of time, whereas radical changes are changes which happen suddenly, are dramatically and have a marked effect. Gradual changes are often pre-fixity changes and radical changes are often post-fixity changes. Anticipated changes are discovered during the project and before they actually occur, whereas emergent changes are changes which arise spontaneously and are not anticipated or intended.

Project changes can also be classified as directed changes and constructive changes. Directed changes are directed by the client and are understood by the client to be a change to the contract, whereas constructive changes are changes which typically result from the (in)actions of the client and are usually not intended or recognized by the client to be a change to the contract (ORACLE, 2009, pp. 2-3).

4.3 Change management

According to (Nicholas & Steyn, 2012, pp. 421-422) the following generally applies to construction projects: ‘the larger and more complex the project, the greater the number of changes and the more that actual costs and schedules deviate from objectives. Moreover, the further along the project, the more detrimental is the effect of changes’. Figure 11 illustrates this by showing the impact of design changes during D&B construction projects. In D&B projects, the design phase and the construction phase overlap for a large part, which means that construction already starts when the design is not final yet. Compared to DBB projects, the opportunity to introduce changes decreases faster and the costs of changes increases faster in D&B projects (Koch et al., 2010, p. 197). The distinction between pre-fixity and post-fixity changes is directly linked to this (Lazarus et al., 2001, p. 20).

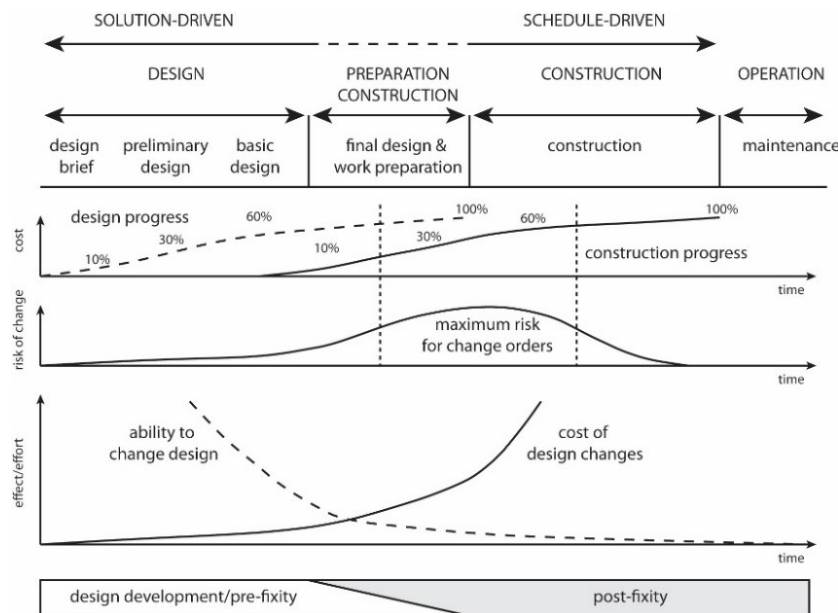


Figure 11: Impact of design changes in D&B based on (Koch et al., 2010, p. 197; Lazarus et al., 2001, p. 20)

According to (Koch et al., 2010, pp. 196-198, 217), the risk for change orders is the highest during the final stages of design and in the middle stages of construction. This is because there is a high probability of conflicting aspects at this stage since the designs by various disciplines will then be combined, subsequently the final design will be reviewed with respect to schedule and budget, and finally the subcontractors will review the construction documents. Most of these changes occur internally in the contractor’s team, because in D&B projects, the contractor is responsible for the design. This stage is also the final stage for the client to change the contractual scope of work. Changes are inevitable and thus both client and contractor should put great effort into managing the changes during the project in order to minimize the impact and costs of these changes. The maximum risk for change orders occurs quite late in the project with respect to the opportunity to make changes and the cost of changes. Therefore, the timing of dealing with changes is very important and early identification of changes is beneficial. As stated in (Lazarus et al., 2001, pp. 28-32), three stages can be distinguished with regard to implementing design changes:

1. Before construction starts (pre-fixity)
2. After construction starts but before final design is complete (pre-fixity or post-fixity)
3. During construction after final design is complete (post-fixity)

In addition, post-fixity changes can be distinguished in urgent and non-urgent. According to (Koch et al., 2010, pp. 201-208; Lazarus et al., 2001, pp. 28-32), pre-fixity changes, urgent post-fixity changes and non-urgent post-fixity changes should be managed by slightly different processes. If the change is post-fixity, two additional activities in the form of redesign and construction rework may be required. The second stage could follow either the pre-fixity process or the post-fixity process, dependent on whether the change affects a feature of work that partly has already been constructed or not. Urgent post-fixity changes require prompt and effective communication between the site-based team and the project team. In order to achieve this, it is necessary to allow the site-based construction team to review and approve changes that have no or little impact on time and costs. Furthermore, it is preferable to allow this team to issue instructions that do have a cost effect, but it is advisable to limit their authority to spend monies up to a certain number.

4.4 Causes and effect of changes

In the literature, there are many scientific articles about the causes and effects of changes for construction projects in general, but there is little literature about this subject specifically for D&B projects. Both (Sun & Meng, 2009, pp. 567-569) and (Keane, Sertyesilisik, & Ross, 2010, pp. 91-92) have developed an extensive overview of the most likely causes and effects of variations on construction projects in general. (Pishdad-Bozorgi & De la Garza, 2012, pp. 24-30) focus on comparing DBB and D&B in terms of the influential factors triggering client's and contractor's claims. This article includes some causes of variations for both DBB and D&B. An extensive table with possible causes and effects can be found in Appendices 10 and 11 respectively. Causes can be external (environmental, political, social, economic or technological factors), organizational (process, people or process related), and project internal (client, design consultant, contractor, subcontractor, contract or otherwise generated) (Keane et al., 2010, p. 91; Pishdad-Bozorgi & De la Garza, 2012, pp. 24-30; Sun & Meng, 2009, p. 567). Different types of effects can be distinguished: time effect (time extension, loss of productivity, increased risk or payments), cost effect (direct or indirect cost increase), relationship and people effect (relationship related, working conditions, staff related or quality), and other effect (progress) (Keane et al., 2010, pp. 91-92; Sun & Meng, 2009, pp. 567-569).

4.5 Change management system

The following figure illustrates the five principles of a generic change management system which resulted from a major research in 1994 by the Construction Industry Institute (CII) in the US. This system was further elaborated in 2001 by the CII Project Change Research Team. This change management system has two levels: the first level consists of the five starting principles, whereas the second level is more detailed and consists of management processes (Ibbs et al., 2001). The five principles of CII's change management system have been used by the Construction Industry Research and Information Association (CIRIA) in the UK to create a best practice guide for effective management of change on projects (Lazarus et al., 2001).

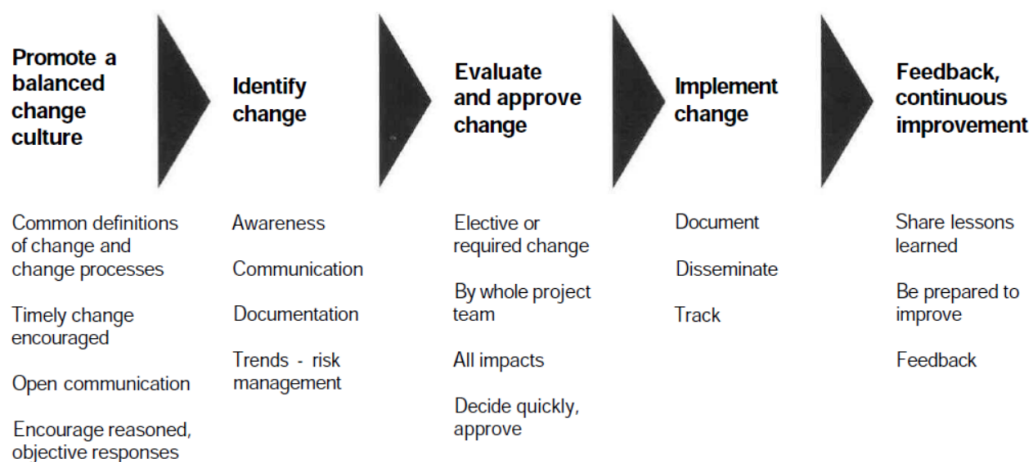


Figure 12: The five principles of effective change management (CII, 1994)

These five principles have been used by many researchers as a basis to create their own change management system. (Sun et al., 2006) have created a change management toolkit for construction projects based on these five principles, but they put more emphasis on the evaluation of the relationship between change causes and effects in the context of the project in order to avoid changes or to minimize the negative impacts of changes. (Arain & Pheng, 2007) are of the opinion that CII's change management system lacked the basic principle and process of implementing controls for future variations in construction projects, therefore their system consists of six principles. (Egan et al., 2012) have created a change management system which was based on four different change management approaches. The six principles are briefly discussed below (Senaratne & Sexton, 2011, pp. 20-21):

1. Anticipate change means that a balanced change culture must be promoted and a strategy (e.g. communication and documentation policies) must be developed at the start of the project in order to deal with changes when they occur.
2. Recognize change means that the potential change must be identified and discussed before it actually occurs.
3. Evaluate change means that the change must be evaluated by identifying its impact on the project. Several options will be compared in order find its most effective implementation.
4. Resolve change means that the change is implemented and that the final change decision is communicated and documented.
5. Monitor implementation means that the change implementation process is monitored and recorded.
6. Learn from change means that the change is reviewed (e.g. by a root cause analysis) in order to learn from mistakes for future projects.

4.6 Components in the change management system

In the literature, there were no change management systems specifically for D&B projects. Therefore, the author decided to use and compare the five different change management systems and its components which were mentioned in the previous sub section (see Appendix 12). These components consist of joint activities and processes that build and sustain efficient and effective change management. Each change management system consists of five or six principles and each principle associates with multiple components. Similar components which are found in multiple change management systems are considered to be crucial and are therefore selected. These components are based on the comparison of the change management systems of (Arain & Pheng, 2007; Egan et al., 2012; Ibbs et al., 2001; Lazarus et al., 2001; Sun et al., 2006) and are listed below, but are not described any further since they are self-explanatory .

Anticipate change

- Align project goals and objectives
- Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider
- Agree on project philosophy with regard to risk allocation
- Prior identification of areas where changes likely occur (e.g. by risk management)

Recognize change

- Early identification of potential changes
- Assess potential impact (e.g. by value engineering) and create a proposed change order
- Document the proposed change in a log

Evaluate change

- Determine priority of the change
- Selection of optimum change options by consulting all relevant parties
- Identify the likely impacts of different change options

- Prompt decision making as to whether to accept/reject the change by someone with authority

Resolve change

- Communicate final change decision to all team members whose work is affected by it
- Appropriate documentation to record all decisions within the change process

Monitor implementation

- Monitor and record implementation

Learn from change

- Conduct a review and create lessons learned from the change event
- Update shared databases and incorporate lessons learned for project and organization

4.7 Maturity model for change management

There is not much literature about measuring change management and its components. (Sun & Oza, 2008) have created a capability maturity model for change management which is by far the most complete one as it covers many of the change management components. Professor Ming Sun was also involved in developing the maturity model for relationships that was discussed in the previous chapter, which is noticeable as the two models are quite aligned. The maturity model for change management can be used as a tool to measure the change management level in quantitative way in order to determine the current level and the aspects that should be considered to improve the change management level. The layout of the maturity model can be seen below, whereas the complete maturity model can be found in Appendix 13.

Table 27: Layout of maturity model for change management (Sun & Oza, 2008)

Main criteria	Level 1 Ad-hoc change management	Level 2 Informal change management	Level 3 Systematic change management	Level 4 Integrated change management	Level 5 Continuous improvement in change management
MANAGEMENT PROCESS	evaluates the consistency and effectiveness of the change management procedures.				
RISK MANAGEMENT	evaluates the existence of any risk management procedures in a project team and how effectively and efficiently these procedures are implemented				
COMMUNICATION	assesses the capacity of the communication systems used and the extent that the project team utilizes capability				
MANAGEMENT INFORMATION	assesses the effectiveness of the project information management				
COLLABORATION	evaluates the extent to which the parties collaborate in dealing with changes				
LEADERSHIP OBJECTIVES	evaluates the senior management involvement in preparing the project team to deal with changes, and the individual and shared objectives				

The maturity model consists of five maturity levels, six main criteria, and detailed descriptions for each criterion at five different maturity levels. In the first level of change management, the processes are ad-hoc and the project team is in a dormant state with respect to managing changes. In the second level, informal change management processes are established and the project team acts reactive to changes. In the third level of change management, the processes are systematic and the project team acts adaptive to managing changes. In the fourth level, change management processes are integrated throughout the team and the project team is supportive to managing changes. In the fifth level of change management, the processes are continuously improved and the project team is proactive to managing changes (Sun & Oza, 2008, pp. 11-14).

III. Case study setup

5 Assessment model for trust and change management

6 Assessment of the standard forms of contract

5. Assessment model for trust and change management

This chapter deals with the third sub question: Which criteria with regard to construction project management and construction contract law are relevant for assessing trust and the change management process on complex D&B infrastructure projects? The objective of this sub question is to create an assessment model for trust and for change management which can be used to assess and compare the standard forms of contract and the case study projects. To achieve this objective the components and the maturity models for trust and change management found by means of the literature survey were used to create the assessment models. This chapter describes how the model was created and how it should be used.

5.1 Setup of the assessment model for trust

Table 28: Assessment model for trust

Objective	Phase	Topic	Criteria = standard	Based maturity model adapted from (Meng et al., 2011)	
				Level (1-4)	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	
			(2) Seek party with similar culture/policy	3	
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2.5
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	
TOTAL LEVEL OF TRUST RELATIONSHIP			2.91		

Setup of the model

The assessment model for trust is shown in the table above. The criteria consist of the components for building trust, which resulted from the literature study on trust (SQ1). The topics are directly related to the criteria and were derived from them. The overall objective is a relationship between the client and the contractor that is based on mutual trust. A distinction was made between criteria related to building initial trust at the start of the project (including the tender phase) and criteria related to creating and sustaining trust during execution.

Scoring the criteria

The maturity model by (Meng et al., 2011) was transformed and aligned to the criteria in the assessment model, which means that some aspects were omitted, shifted or adapted. The original and the adapted maturity models can be found in Appendices 8 and 9, respectively. In the assessment model, the criteria are numbered (1-11), these numbers were used throughout the research and the report to indicate to which criteria the findings are related. The author has rated the criteria in the assessment model by means of the adapted maturity model. These scores form a standard for the three contracts and the case study projects. The trust level of this standard is 2.91, which implies that a high/strong trust relationship is required between the client and the contractor according to the findings in the literature. To explain the scoring process, a part of the adapted maturity model is given in the table below. The topic 'objectives' which is related to criteria (3) can be divided into sub topics. All criteria will be given a score from level 1 to 4, which is the average of the scores of the sub topics. According to highlighted sub subtopics in the table below, the score for criteria (3) is 2.5. If all criteria scores are known, the total level of the trust relationship can be calculated by taking the average of all these scores. The scores per

criteria of the contracts and the case study projects can be compared with the standard in order to see which aspects should be addressed to improve the trust level.

Table 29: Example of the customized maturity model for relationships in construction adapted from (Meng et al., 2011)

Criteria	Topic	Sub Topic	Level 1 Low trust relationship	Level 2 Confident trust relationship	Level 3 High/strong trust relationship	Level 4 Complete trust relationship
(3)	OBJECTIVES	Objectives alignment	Only self-objectives	Mainly self-objectives	Mutual objectives in a project	Mutual objectives in the long-term
		Benefits	Win-Lose	Win-Partial win	Win-Win in a single project	Win-Win in the long-term

5.2 Setup of the assessment model for change management

Table 30: Assessment model for change management

Objective	Phase	Topic	Criteria = standard	Based maturity model adapted from (Sun & Oza, 2008)	
				Level (1-4) standard	Level (1-4)
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	
			(6) Update shared databases and incorporate lessons learned for project and organization	4	
	Recognize change	Change management process	(7) Early identification of potential changes	4	3.5
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	
			(9) Document the proposed change in a log	3	
	Evaluate change		(10) Determine priority of the change	3	
			(11) Selection of optimum change options by consulting all relevant parties	3	
			(12) Identify the likely impacts of different change options	3	
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	
			(15) Appropriate documentation to record all decisions within the change process	3	
	Monitor implementation		(16) Monitor and record implementation	3	
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	

Setup of the model

The assessment model for change management is shown in the table above. The criteria consist of the components in the change management system, which resulted from the literature study on change management (SQ2). The topics are directly related to the criteria and were derived from them. The overall objective is an efficient and effective change management process. A distinction can be made between criteria related to efficiency and criteria related to effectiveness. The first 6 criteria mainly increase the efficiency of the change management process, whereas the other criteria are related to both efficiency and effectiveness. Further, the criteria were categorized per phase/principle in the change management system.

Scoring the criteria

The maturity model by (Sun & Oza, 2008) was transformed and aligned to the criteria of the assessment model. Professor Ming Sun was also involved in developing the maturity model used for trust, which is noticeable as the two models are quite aligned. The first maturity level 'ad-hoc' change management was discarded in order to make this maturity model compatible to the maturity model for trust. The initial idea was to analyse the data by means of comparing the scores for trust and change management and noticing patterns in them which indicate

the influence of trust on the change management process. After collecting all the data, it turned out that this data analysis technique would not be effective in finding such patterns. Furthermore, the descriptions in the maturity model were sorted, sub topics were added, and some aspects were omitted, shifted or adapted. The original and the adapted maturity models can be found in Appendices 13 and 14, respectively. The criteria in the assessment model are numbered (1-16), these numbers were used throughout the research and the report to indicate to which criteria the findings are related. The author has rated the criteria in the assessment model by means of the adapted maturity model. These scores form a standard for the three contracts and the case study projects. The change management level of this standard is 3.19, which implies that integrated change management is required between the client and the contractor according to the findings in the literature. A part of the adapted maturity model for change management is given in the table below. The scoring process is similar to the one for trust. If all criteria scores are known, the total level of change management can be calculated by taking the average of all these scores. The scores per criteria of the contracts and the case study projects can be compared with the standard in order to see which aspects should be addressed to improve the change management level.

Table 31: Example of the customized maturity model for change management adapted from (Sun & Oza, 2008)

Criteria	Aspect	Sub Aspect	Level 1 Informal change management	Level 2 Systematic change management	Level 3 Integrated change management	Level 4 Continuous improvement in change management
(7)	CHANGE MANAGEMENT PROCESS	Approach	The project team is still largely reactive to changes rather than anticipates them.	The project team begins to be proactive in anticipating changes. The project team is 'adaptive' to managing changes.	Most changes are managed proactively. The project team is 'supportive' to managing changes.	The project team is 'proactive' towards change management processes

6. Assessment of the standard forms of contract

This chapter deals with the fourth sub question: To what extent do the UAC-IC 2005, the NEC3 ECC and the FIDIC YB meet the set of assessment criteria? The objective of this sub question is to assess the standard forms of contracts in terms of trust and change management by means of the assessment models in order to determine how facilitating the contracts are for building trust and creating an efficient and effective change management process. The assessment results were used as input for the case study projects. One objective of the case study is to validate the effectiveness of the contract clauses regarding trust and change management. The first sub section of this chapter discusses how the three standard forms of contract were analysed and assessed. The three sub sections thereafter deal with the subjects 'trust' and 'change management' in the UAC-IC 2005, the NEC3 ECC and the FIDIC YB respectively.

6.1 Setup of the assessment of the standard forms of contract

The assessment of the UAC-IC 2005, the NEC3 ECC and the FIDIC YB contains the following steps:

1. Study and analyse the clauses in the contracts and the explanatory notes to them which are related to the key criteria in the assessment models of trust and change management (chapter 5). The analyses of the change management clauses of the three contracts by means of flowcharts can be found in Appendices 15, 16 and 17.
2. Browse through books, scientific articles, conference papers, magazines etc. to find comments on these clauses in the contracts. The comments found in literature were checked in terms of relevance and validity.
3. Assess the UAC-IC 2005, the NEC3 ECC and the FIDIC (i.e. the findings in the contracts themselves and the comments found in literature) in terms of 'trust' and 'change management' by means of the maturity models (Appendix 9 and 14). The tables below give an example of a filled out assessment model and a part of the maturity model which is used to determine the scores. In this manner, all trust and change management criteria were given a score from level 1-4 per contract. The filled out assessment models give a clear overview of the strong and the weak points of the contract. The total trust level and change management level which the contracts can facilitate were calculated by taking the average score of all scores.

Table 32: Example of a filled out assessment model for trust

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	2.5
			(2) Seek party with similar culture/policy	3	-
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2.5
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	1.5
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	1.5
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	2
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	-
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	2.5
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	-
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	2
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	-
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	1.32

Table 33: Example of a filled out maturity model for trust

Criteria	Topic	Sub Topic	Level 1 Low trust relationship	Level 2 Confident trust relationship	Level 3 High/strong trust relationship	Level 4 Complete trust relationship
(3)	OBJECTIVES	Objectives alignment	Only self-objectives	Mainly self-objectives	Mutual objectives in a project	Mutual objectives in the long-term
		Benefits	Win-Lose	Win-Partial win	Win-Win in a single project	Win-Win in the long-term

4. Use the scores in the assessment model to categorize trust building and efficiency and effectiveness creating aspects found and display them on an overview table to show the strong and weak points. Some topics were divided into sub topics. The sub topics are classified in accordance with their sub topic score in the maturity model. See the tables above and below for the example of criteria (3). The aspects in the overview tables have a number (#) that indicates to which criteria in the assessment model they are related. The tables may also include aspects which are not covered by the maturity model. The overview tables for ‘trust’ and ‘change management’ are placed and elaborated in the next three sub sections (6.2-6.4).

Table 34: Example of an assessment overview table for trust

Building trust (score 3-4)
(3) Good faith in Art. 6:2 and Art. 6:248 in the DCC: The parties have to take each other's reasonable interests into account
Could be done better to build trust (score 2-2.5)
(3) No other mutual objectives besides fitness for purpose
Building distrust (score 1-1.5)
-
Indecisive (no score)
-

6.2 UAC-IC 2005: trust and change management

Table 35: General data UAC-IC 2005 (CROW, 2005)

Name	Uniform Administrative Conditions for Integrated Contracts 2005
Year	2005
Components	The Basic Contract and the General Conditions
Type of contract	National contract (The Netherlands)
Origin	Civil law
Project delivery systems	From straightforward to complex D&B, DBM and E&C
Key principles	Consensus between the parties and avoid open ends

The UAC-IC 2005 were assessed by means of the assessment models of Chapter 5. The next two sub sections start with the conclusions regarding trust and change management in the UAC-IC 2005, respectively. Subsequently, the conclusions were substantiated in detail. The scores and the main aspects are summarized in two tables (one for trust and one for change management) and were explained further below the tables. The explanation per topic encompasses the main findings in the UAC-IC 2005 and the relevant comments found in the literature. The comments which could not be verified are indicated as ‘other relevant comments found in literature’. A comparison with the other two standard forms of contract regarding the findings can be found in Appendices 18 and 19.

Discussion of trust in the UAC-IC 2005

Table 36: Assessment model for trust in the UAC-IC 2005

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	2.5
			(2) Seek party with similar culture/policy	3	-
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2.5
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	1.5
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	1.5
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	2
	Trust during project implementation	Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	-
		Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	2.5
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	-
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	2
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	-
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	1.32

Overall, the level of trust between the Employer and the Contractor that the UAC-IC 2005 can facilitate is 1.32 out of 4 (see table above), which implies a low trust level. The table below gives an overview of the trust and distrust building aspects in the UAC-IC 2005, which are explained further per topic below the table. The most important aspects which may build trust are: the principle of good faith in Art. 6:2 and Art 6:248 in the Dutch Civil Code (3+8), the equitable risk allocation (6), and the Procurement Act 2012 (i.e. the MEAT award criterion, procurement procedures, selection requirements) (1). The UAC-IC 2005 do not have provisions for ‘trustworthiness during procurement (culture)’ (2), ‘repeated fulfilment of communication’ (9) and ‘continuous improvement of the relationship’ (7+11), which is the main cause of the low trust level. It is important to note that the aspects indicated as ‘building distrust’ do not necessarily lead to distrust, in this case it means that the UAC-IC 2005 do contain some requirements regarding those aspects, but these are limited such as the communication requirements and the warning obligations.

Table 37: Overview of trust building aspects in the UAC-IC 2005

Building trust (score 3-4)
(3) Good faith in Art. 6:2 and Art. 6:248 in the DCC: The parties have to take each other's reasonable interests into account
(6) To a large extent the risks are allocated to the party best able to manage them
Could be done better to build trust (score 2-2.5)
(1) Procurement Act 2012: Apply the MEAT award criterion. The criteria may only be related to the contract that is being rewarded.
(1) Public Works Procurement Regulations 2012: The 'open procedure' and the 'restricted procedure' may be used freely, the use of the other procedures is restricted.
(1) Public Works Procurement Regulations 2012: Grounds for exclusion and minimum and/or suitability requirements merely lead to competence trust.
(3) No other mutual objectives besides fitness for purpose
(5) Limited requirements to collaborate and to help resolve problems. Depending on the case, the principle of good faith in the DCC may lay down requirements on the parties to do so.
(5) Clear claims procedure, but the types of claims are not fully clear
(6) Ultimate risk allocation is unclear
(8) Good faith in Art. 6:2 and Art. 6:248 in the DCC has three functions: interpretation, supplementation, and correction and limitation. The principle may not be fully effective as the UAC-IC 2005 do not refer to the DCC.
(8) The Employer may only instruct the Contractor to remove their representatives from the project, but not any member of their team
(10) By default, the Court of Arbitration is authorized to settle disputes. Option to authorize the DAB to settle disputes, but generally, employers do not apply this option.
Building distrust (score 1-1.5)
(4) Limited communication requirements and no communication system. The Employer may be reluctant to provide information.
(5) Mutual warning obligation for errors in Contractor's and Employer's documents, but no early warning for risks. The sanctions for both parties are unclear though.
(6) No risk sharing
Indecisive (no score)
(7) Continuous improvement (system)
(9) Communication (repeated fulfilment)
(11) Continuous improvement (emotional investments)

(1+2) Trustworthiness during procurement

The Procurement Act 2012

Since April 1, 2013, public and semi-public institutions are obliged to apply the Procurement Act 2012 to all their procurements (Pianoo, 2014a). According to (Chao-Duivis et al., 2013, p. 135), the main principle regarding European Law which public clients have to take into account is 'the principle of free movement of goods and services and the right of establishment'. This principle is laid down in the EC Treaty. In addition, there are European Directives which consist of rules that the member states have to implement in their national laws (Doornbos et al., 2013, pp. 219-220). So procurement law is still national law, but parts of it have been harmonized within Europe. The European Directive which is relevant for the type of projects researched here is the Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts. This Directive is implemented in the Procurement Act 2012 (Doornbos et al., 2013, pp. 219-220). Clients have to take into account the principles of procurement law such as the principle of equality, the principle of transparency, the principle of proportionality, the principle of competition, the obligation to state reasons and the protection of legitimate expectations. The principle of equality is the most important one and takes precedence if the principles conflict with each other (Chao-Duivis et al., 2013, p. 137). These principles ensure fairness for all potential tenderers in the procurement process.

The procurement procedures

According to (Chao-Duivis et al., 2013, p. 138; Pianoo, 2014b), the size of the contract is important to determine whether it has to be put out to European tender or not. Article 7 in the Directive 2004/18/EC lays down the limits for public contracts. The limit which is relevant for the type of projects researched here is the one for public works. In 2014-2015, this limit is €5,186,000. The European Commission revises the limits every two years. Public contracts equal to or above this limit have to be put out to European tender. The type of projects researched here exceeds the limit, which implies that such projects have to be put out to European tender. The Public Works Procurement Regulations (in Dutch: Aanbestedingsreglement Werken) 2012 is part of the Procurement Act 2012 and sets out several procurement procedures for both European and National tenders which clients may apply.

When choosing a certain procurement procedure, clients have to take into account the principle of transparency and the principle of proportionality. In addition, the Regulations lay down restrictions with regard to the choice of the procurement procedure. For example, the 'direct agreement procedure' can only be applied to National tenders and in European tenders both 'negotiated procedures' and the 'competitive dialogue' can only be applied to specific cases. In contrast, the 'open procedure' and the 'restricted procedure' may be used freely (Doornbos et al., 2013, pp. 220-224).

Selection criteria

According to the Public Works Procurement Regulations 2012, firstly, clients have to apply the grounds for exclusion (e.g. bribery, money laundering, bankruptcy and tax debt) in every procedure. Subsequently, the client may apply minimum requirements and/or suitability requirements, which have to be objective and unambiguous. Lastly, the client may apply a selection method such as a lottery to reduce the number of tenderers (Doornbos et al., 2013, p. 225).

MEAT award criterion

Pursuant to Art. 2.114 in the Procurement Act 2012, in principle, the Most Economically Advantageous Tender (MEAT) award criterion has to be applied to all procurements (i.e. above and below the European tender limits), which means that the contract is not allowed to be awarded on the basis of the lowest price, but it has to be based on other criteria as well. The contracting authority may apply the lowest price criterion if they have valid reasons to do so and state them in the tender documents. The contracting authority is free to choose those other award criteria in as far as they are related and proportionate to the contract that is being awarded and are transparent, objective and unambiguous (Pianoo, 2014c, 2015). Possible award criteria are, for example, the construction method, project management, sustainability and risk management (Pianoo, 2014c). The contracting authority is also free to choose the assessment method for the award criteria in as far as the assessment method is proportionate to the contract that is being awarded and does not lead to a lowest price tender in the end. The latter implies that the contracting authority has to find such an assessment method in which it is an advantage to the tenderer to offer a higher quality as he can really distinguish himself by doing so (Pianoo, 2015).

(8) Reasonable behaviour

Good faith in the DCC

According to §48 in the UAC-IC 2005, the Contract is subject to the Dutch law. The Dutch Civil Code (DCC) includes the principle of objective good faith. According to (Busch, 2002, p. 48; Hesselink, 2010, p. 634), good faith is applicable to the whole law of obligations, contract law and patrimonial law. In addition, it is applied in innumerable situations and during all contract phases. Art. 6:2 and Art. 6:248 in the DCC are two important clauses regarding this principle. The former covers reasonableness and fairness within the relationship between the creditor and debtor, whereas the latter deals with the legal effects arising from law, usage or the standards of reasonableness and fairness. The term 'reasonable and fairness' is used to emphasize that it regards objective good faith and not subjective good faith as in Art. 3:11 in the DCC (Busch, 2002, p. 49). Art. 6:2 and Art. 6:248 in the DCC read as follows (DutchCivillaw.com, 2014; Wetboek-Online.nl, 2014):

6:2. '1) The creditor and debtor must behave themselves towards each other in accordance with the standards of reasonableness and fairness.

2) A rule in force between a creditor and his debtor by virtue of law, common practice or a juridical act does not apply as far as this would be unacceptable, in the circumstances, by standards of reasonableness and fairness'.

6:248. '1) An agreement not only has the legal effects which parties have agreed upon, but also those which, to the nature of the agreement, arise from law, usage (common practice) or the standards of reasonableness and fairness.

2) A rule, to be observed by parties as a result of their agreement, is not applicable insofar this, given the circumstances, would be unacceptable to standards of reasonableness and fairness'.

Good faith in Dutch law is an open norm and Art. 3:12 DCC states what should be taken into account in determining what the principle demands in a specific situation (Hesselink, 2010, pp. 622-623). Art. 3:12 DCC reads as follows (DutchCivillaw.com, 2014; Wetboek-Online.nl, 2014):

3:12. 'At determining what the principle of 'reasonableness and fairness' demands in a specific situation, one has to take into account the general accepted legal principles, the fundamental conceptions of law in the Netherlands and the relevant social and personal interests which are involved in the given situation'.

According to (Busch, 2002, pp. 49-50; Hesselink, 2010, pp. 623-625), the content of the norm can be established by means of defining functions and Fallgruppen (i.e. groups of cases in which good faith has previously been applied). In the Netherlands, good faith has three functions. The Fallgruppen can be placed under the functions for further concretisation. First, interpretation, which means that all contracts have to be interpreted in accordance with reasonableness and fairness. Fallgruppen are seldom placed under this function, but there are three forms of interpretation: objective, supplementing and correcting. Second, supplementation, which implies additional rights and duties that are not explicitly covered in the contract. The main Fallgruppen of this function consists of duties such as a duty of loyalty, a duty of protection, a duty to co-operate and a duty to inform. Art. 6:2 (1) and Art. 6:248 (1) DCC have a supplementing function. Third, correction and limitation, which means that the rules in the contract have to be according to reasonableness and fairness. The main Fallgruppen of this function encompasses, for example, improper behaviour, unclean hands and inconsistent behaviour. Art. 6:2 (2) and Art. 6:248 (2) DCC have a limiting function.

Good faith in the UAC-IC 2005

The UAC-IC 2005 do not explicitly state how a party should behave towards the other party and they do not refer to the DCC, but the principle of good faith is included in some clauses of the UAC-IC 2005. For example, in §4 (5) the Contractor's obligation to perform all duties according to good faith (supplementing and limiting function), §14 (6) the grounds for refusal on the basis of good faith (limiting function), and §44 (1c) the cost compensation and/or extension of time on the basis of good faith (limiting function).

Influence on the Contractor's team

According to §2 (7) and §2 (8) in the UAC-IC 2005, the Contractor has to appoint their representative with respect to the works and the maintenance works and a substitute for him. Both persons have to be acknowledged by the Employer by means of the acknowledgement procedure in §23. §15 (3) lays down a rule that this procedure has to be applied again if the Contractor wishes to replace an acknowledged representative. Pursuant to §14 (1), the Employer may instruct the Contractor to change their acknowledged representatives.

(3) Project objectives

Fitness for purpose

The UAC-IC 2005 do not explicitly state that the works have to be fit for purpose, but the requirement of this standard of care can be derived from sub clauses §4 (1) and §4 (3). The former sub clause states that the Contractor has to carry out the design work and the construction work in such a way that it will be in accordance with the requirements of the contract when completed, otherwise it will constitute a defect. Defects at the time of completion and acceptance are dealt with in clause 28. The latter sub clause states that these requirements result from the ordinary and the specific use for which the works are intended, as (Chao-Duivis, 2006, pp. 457-460) points out, this means that the Contractor not only has to take into account the explicit requirements in the contract, but also the implicit ones. Sub clauses §4 (1) and §4 (3) read as follows (CROW, 2000, p. 17):

1. 'The Contractor shall carry out Design Work and Construction Work in such a manner that, on the date of completion stated in the Basic Contract, the Works will be in accordance with the requirements of the Contract. If the Works are not in accordance with the said requirements, this amounts to a defect'.

3. 'The requirements referred to in sections 1 and 2 include requirements resulting from the ordinary use for which the Works are intended as well as the requirements resulting from the specific purpose for which the Works will be used, only in so far as the requirements resulting from the specific purpose are stated in the Employer's Requirements'.

The interpretation of the contract may result in disagreements between the Employer and the Contractor since the parties' interests are often contradictory. Although it is impossible to define and describe all requirements for both the ordinary and specific use in the contract, as stated in (Chao-Duivis, 2006, pp. 457-460; Van den Berg,

Bregman, & Chao-Duivis, 2010, pp. 494-495), doing this as clearly and as complete as possible would certainly lower the probability of any disagreements about it.

From the two sub clauses, it is quite clear that the works have to be fit for purpose. However, (Bleeker, 2014b, pp. 711-712, 716) argues that arbitrators do not assume a fitness for purpose obligation for the Contractor in UAC-IC 2005 projects as the Contractor only includes the work which explicitly can be derived from the ER in his tender price. Bleeker further states that if the requirements in the ER are not stated clear enough, the Employer cannot rely on an implicit guarantee by the Contractor.

Other relevant comments found in literature:

- As stated in (Chao-Duivis, 2006, pp. 460-461), there was criticism on the fitness for purpose requirement in the UAC-IC 2005, especially from contractors. First, they felt that it was unfair that a designer under TNR 2005 (i.e. a designer under traditional contracts) has to deliver a lower standard of care (i.e. reasonable skill and care) than the designer-contractor. However, according to the authors of the UAC-IC 2005, the liability for the design work has to be aligned with the liability for the construction work in D&B projects, otherwise it would be difficult to determine whether the design work or the construction work is responsible for the error or defect. Second, a contractor cannot insure the works against fitness for purpose.

WIN for both parties

According to the principle of objective good faith in Art 6:2 and Art. 6:248 in the DCC, the parties have to take each other's reasonable interests into account. What is meant with reasonable interests, again, depends on the circumstances of the case and the nature of the contract. The court will consider three aspects to determine which interests and principles of law have to be taken into account: the generally accepted principles of law, current juridical views in the Netherlands, and particular societal and private interest involved (Busch, 2002, pp. 63-64).

(4+9) Communication

Limited communication requirements between the parties

The UAC-IC 2005 do not contain explicit clauses dedicated to communication between the parties and do not set out a communication system, but the procedures in the UAC-IC 2005 (e.g. the acknowledgement procedure and the variations procedure) do contain requirements for formal communication between the parties, such as the notification in writing, the period of reply, and the notice of default.

(van Gulijk & Neerhof, 2014, pp. 17-18, 20-23) define communication as 'a continuous process of active mutual exchange of information between two or more actors' and indeed state that there is a lack of explicit communication requirements in the UAC-IC 2005m, but also in the Dutch law. They argue that the Dutch law and the UAC-IC 2005 do contain some implicit communication requirements which arise from the parties' duties of care, such as the obligations to provide information, to notify and to warn. Van Gulijk and Neerhof have identified several duties of care in the Dutch Civil Code: the Contractor's obligation to keep the Employer up to date about the works and to render account for the execution of the job (Title 7.7), the Contractor's pre-contractual and contractual duty to warn for ambiguities in the Employer's documents (Art. 7:754), the Contractor's contractual duty to warn for cost increases due to unforeseen cost increasing circumstances (Art. 7:753), and the Contractor's contractual duty to warn for cost increases due to additional works (Art. 7:755). The several duties of care which they have identified in the UAC-IC 2005 are: the Employer's duty to co-operate in terms of providing information (§3.1), the Contractor's warning obligation for obvious faults or defects in the Employer's documents (§4.7), the Contractor's duty to notify his entitlement to cost compensation and/or time extension (§44.2), and the Contractor's duty to research instructed variations and to inform about it (§14.4). The former two duties are elaborated in the next sub section. Van Gulijk and Neerhof also mention some implicit communication requirements in the UAC-IC 2005 like the Contractor's obligation to co-operate in terms of obtaining the permits and/or licences, exemptions, orders and permissions (§9.1), and the Contractor's obligation to draw up quality management plans for acceptance by the Employer (§19). Further, (van Gulijk & Neerhof, 2014, p. 46) state that the Contractor's warning obligation for obvious faults or defects in the Employer's documents (§4.7) is unilateral and reactive, therefore it does not create effective and interactive communication.

Information provided by the Employer

§3 (1a) states that the Employer has to provide the information which is needed for the Contractor to execute the works and §4 (7) states that the Contractor has an obligation to warn for errors in the Employer's documents, but like (Chao-Duivis & Wamelink, 2013, pp. 46-47, 145-146) remark, both clauses do not instigate the parties to have a discussion with each other in order to find a solution for the errors. The warning obligation of §4 (7) is dealt with in the next sub section. §3 (1a) reads as follows (CROW, 2000, p. 16):

1a. 'The Employer shall ensure that the following are at the Contractor's disposal in good time: (a) all information in the possession of the Employer, in so far as the provision thereof is necessary in order to enable the Contractor to execute the Works and the Long-Term Maintenance in accordance with the Contract'.

The Explanatory Notes to this sub clause state that it concerns necessary information the Employer possesses to execute the works which the Contractor cannot obtain himself. Therefore, as (Bleeker, 2014a, pp. 604-605; Chao-Duivis, 2006, pp. 468-469) point out, it may be difficult for the Employer to determine what information he has to provide, especially since there are multiple tenderers each with their own resources to obtain information. Bleeker further argues that a contractor cannot prove that he cannot obtain the information himself as he can only state that, so it is up to the Employer to prove that there is another way for the contractor to get the information. (Bleeker, 2014a, pp. 604-605) justly argues that, any discussions about obtaining information would affect the efficiency of the whole construction process. Therefore, he suggests it would be better if the Employer just provides all relevant information he possesses which the Contractor needs in order to execute the works, but this might not be so easy to do because as Bleeker also states, in general, employers are quite reluctant to provide information because, pursuant to §3 (2), they are liable for any errors in that information.

Other relevant comments found in literature:

- (Bleeker, 2014a, pp. 608-609) states that pursuant to case law, the Employer is liable for a misinterpretation of the ER by the Contractor if it is caused by not providing relevant information he possesses or by not asking relevant questions regarding a tender, because during the procurement both parties have to take into account the justified interests of the other party.

The Contractor's warning obligation

§4 (7) lays down the Contractor's warning obligation for obvious errors in certain Employer's documents, decisions, goods, variations and so on and reads as follows (CROW, 2000, p. 17):

7. 'The Contractor shall warn the Employer in writing without delay if: (a) the Employer's Requirements; or (b) the annexes to the Employer's Requirements; or (c) the Basic Contract; or (d) information provided to the Contractor by the Employer; or (e) the land and/or the water put at the Contractor's disposal by the Employer pursuant to clause 3 section 1 subsection b; or (f) goods put at the Contractor's disposal by the Employer pursuant to clause 3 section 1 subsection c; or (g) any measure taken by the Employer pursuant to clause 43 section 1 and 2; or (h) any Variation ordered by the Employer to the Contractor pursuant to clause 14 section 1; evidently contain or show such faults or defects that the Contractor would be in breach of the requirements of good faith if he were to continue Work without issuing any warning about such faults or defects'.

It is unclear whether the Contractor is obliged to scrutinize the Employer's documents etc. more than under traditional contracts, because case law contradicts the Explanatory Notes. (Chao-Duivis, 2006, p. 453; Herber & Keulen, 2014, p. 615) argue that the Contractor does have a greater obligation compared to traditional contracts to scrutinize the Employer's products and state that in general, employers may expect a more proactive approach from the tenderers during procurement by means of asking questions and sharing their concerns early on and during project implementation as it is also set out in Art. 7:754 in the DCC. This statement is in line with the Explanatory Notes, therefore it is surprising that (Bleeker, 2014a, pp. 606-609) argues that pursuant to case law, the Contractor does not have a greater obligation during the procurement and during the project implementation, because just like under traditional contracts, the Contractor has to determine which parts the Employer already checked and which parts need more research. Therefore, he argues that, reasoned from good faith, the Contractor has to trust that the information provided is correct as well. Bleeker also mentions that, in practice, this ambiguity about the warning obligation may result in accusations towards the Contractor that he did not warn or that he did not warn sooner. Further, he argues that the warning obligation stated in Art. 7:754 in the DCC would have been better if it were based on reasonableness and fairness so that one can decide on a case-by-case basis whether the Contractor should have warned or not.

If the Contractor fails to give a warning, then pursuant to §4 (8), he will become liable for any damaging consequences caused by his failure. It is uncertain what the sanction for not giving a warning encompasses, since the Explanatory Notes let the arbitrators and the judges decide about its content. The comments found in literature do not clarify the matter either. (De Boer, 2001, pp. 13-14) states that there are two conflicting views in the construction industry. First, the Contractor becomes fully liable for any damaging consequences caused by his failure. Second, the Contractor becomes partly liable as to a certain extent the Employer also has contributed to the damage, so the parties share liability. (Chao-Duivis, 2006, pp. 455, 462) argues that the UAC-IC 2005 indeed do not explicitly deal with the sanction, but that it is governed by §28 (1b and 1c), which lays down that the Contractor is liable for defects the Employer did not notice prior to completion and could not reasonably have detected at the time of completion. The UAC 2012 may provide more insight into the interpretation of the sanction. In the UAC 2012 (§6 (14)), the Contractor has a warning obligation as well, but for obvious errors in the constructions, the construction methods, the orders, the instructions, the materials, the auxiliary plant or the equipment. The sanction for failure to give a warning is similar to the sanction of the warning obligation in the UAC-IC 2005, which is that he will become liable for any damaging consequences caused by his failure. According (Chao-Duivis, 2012, p. 44), the interpretation of the sanction stated in §6 (14) in the UAC 2012 has been standardized by the Court of Arbitration since 1983. The Contractor becomes fully liable for any damaging consequences of the fault or defect caused by his failure, but the potential cost-savings for the Employer in case the Contractor did give a warning will be reduced from this amount. Further, Chao-Duivis states that such damaging consequences may also be shared between the parties if the Employer contributed to the fault or defect by means of his heavy involvement in the construction process or his lack of supervision.

The Employer's warning obligation

The Employer has a warning obligation as well. According to §20 (4) and §21 (10), when the Employer is testing the design work, the construction work and the maintenance work, he is obliged to warn the Contractor if he actually discovers a failure by the Contractor. However, the Employer is not obliged to conduct such tests. When the Employer is acknowledging documents, representatives and subcontractors, work and results of work and variations initiated by the Contractor, then pursuant to §22 (3), he is obliged to warn the Contractor if he actually discovers a failure by the Contractor. When the Employer is accepting the completion of the works, he also has an obligation to warn the Contractor for defects he reasonably should have detected (§28 (1c)). The main discussion in literature is about whether it is fair that the Employer's warning obligation is not comparable to the Contractor's as the Employer's warning obligation is only applicable to errors which he actually discovers or should have discovered.

On the one hand, according to (Bleeker, 2014a, pp. 607-608; 2014b, p. 838; De Boer, 2001, p. 33), it is unfair that the Employer does not have a general duty to warn during tests, that the Employer is not obliged to test the works and that the Employer's warning obligation during the acknowledgement procedure depends on the Employer's expertise to be able to discover any errors. Further, Bleeker rightly states that it is very difficult for the Contractor to prove that the Employer actually has discovered an error, because the Employer may not admit it, therefore the warning obligation loses its normative effect. The Explanatory Notes to §20 (4), §21 (10), and §22 (3) do state that the Contractor may use all available legal means to prove that the Employer actually has discovered an error during the testing or acknowledging procedure. In addition, according to the Explanatory Notes to §28 (1), it is up to the Employer to prove that they could not have reasonably detected the defect when accepting the completion of the works. Bleeker also argues that the unequal warning obligations make it difficult to find a fair solution between the parties, because the knowledge and the conduct of the parties have to be taken into account.

On the other hand, (Herber, 2014; Herber & Keulen, 2014, pp. 836-838; Meeuse-Simon, 2004, pp. 9-10) argue that the unequal warning obligation between the Employer and the Contractor is not unfair, because the objective of such tests and acknowledgements is to inform the Employer about how the Contractor executes the contract and not to inform about whether the Contractor performs well or not. Meeuse-Simon further states

that according to the principles of quality management, the Contractor controls his own design and construction processes and that the Employer's tests do not influence those processes. Herber also argues that such tests merely serve the Employer's interests, so not paying attention by the Employer cannot result in less liability for the Contractor. In addition, Herber argues that acknowledgement of documents is not always preceded by tests, so it may be possible that obvious errors will not be noticed by the Employer. Overall, it seems to be fair that the Employer's warning obligation is not equal to the Contractor's, because it is in line with the principles of quality management.

As stated in (De Boer, 2001, p. 33), it is not clear in the UAC-IC 2005 what the sanction for the Employer is for not giving a warning.

(5+10) Problem-solving

Early warning for risks

The Contractor's and the Employer's warning obligation in the UAC-IC 2005 are limited to errors in documents, decisions, goods, variations and so on, and are not meant to warn for any risks directly. However, errors in the Employer's and Contractor's documents may lead to higher risks than expected, for example, the actual geotechnical conditions are worse than indicated in the geotechnical information.

Collaboration and mutual help

The UAC-IC 2005 do not require the parties to collaborate and help each other in order to resolve problems, but depending on the case, the principle of good faith in the DCC may lay down some additional duties on the parties, like a duty to co-operate and a duty of protection (Busch, 2002, pp. 49-50; Hesselink, 2010, pp. 623-625).

Claims

The cost compensation and/or extensions of time due to Contractor's claims are dealt with in §44. §44 (1) reads as follows (CROW, 2000, p. 51):

1. 'Subject to the provisions of clause 45, the Contractor shall be entitled to cost compensation and/or extension of time only if:
(a) these UAC-IC 2005 expressly provide for such cost compensation and/or extension and on condition that the costs and/or delay are caused by a circumstance that cannot be attributed to the Contractor; or
(b) the costs and/or delay are caused by a circumstance for which the Employer is responsible pursuant to the Contract against which the Contractor did not have to warn given his obligation referred to in clause 4 section 7; or
(c) an unforeseen circumstance arises the nature of which is such that, according to the standards of good faith, the Employer cannot expect the Contract to be maintained unaltered'.

§44 (1a) refers to the following sub clauses in the UAC-IC 2005: §6 (5) a subcontractor nominated in the ER fails to perform, §8 (4) work that is carried out on the orders of the Employer by other contractors influence the Works and/or the Long-Term Maintenance, §11 (2) the Employer fails to inform the Contractor about compliance with any regulations of a special nature, §11 (3) compliance with statutory regulations and government orders that come into force after the day upon which the Contractor has offered his Tender and judgements of any court of law and to arbitration awards pronounced after that day, §13 (5) if Work is delayed due to the discovery of pollution, §13 (7) the discovery of any objects found at the site during Construction and Maintenance Work and which may be of material, historical or scientific interest, §14 (17) delay in the variations procedure due to some specific reasons, §16 (3) if the Contractor has to make provisions as a result of the suspension, §23 (16) delay in the acknowledgement procedure due to some specific reasons, §26 use prior to completion and acceptance of (a part of) the Works by the Employer, §40 (10) assistance in filing the application for a patent if a discovery has arisen through the exchange of knowledge between the parties, §43 (1) measures taken to ascertain whether or not the Contractor is failing or will fail to perform any of his obligations, §45 (13) delay in the quotation procedure for variations due to some specific reasons. Conforming to (Bleeker, 2014b, p. 713), it is not clear what is meant with 'a circumstance that cannot be attributed to the Contractor' in §44 (1a), because such circumstances are not described in the Explanatory Notes and most of these sub clauses already take into account the Contractor's responsibility. In addition, as Bleeker points out, the part 'a circumstance for which the Employer is responsible' in §44 (1b) is also not clear. Therefore, he suggests the parties to interpret the term

‘responsible’ broadly, so that it covers everything which the Employer is responsible for in accordance with the contract.

The Employer’s agent’s role

Pursuant to §2, the Employer may appoint representatives to look after his interests. (Chao-Duivis, 2006, p. 467) rightly argues that the Employer’s agent’s role in the UAC-IC 2005 is not the same as in the FIDIC YB, where the Engineer plays an important role in the claims procedure by means of his fair determination to resolve matters. Further, Chao-Duivis states that the agent in the UAC-IC 2005 is often an architect or consulting engineer and therefore is obliged to act independent and fair anyway due to his code of conduct and under the general terms and conditions of his contract with the Employer.

Dispute Resolution

§47 sets out the rules for dispute resolution. In the Basic Contract (article 18) the Employer has to choose whether he authorizes the Dispute Adjudication Board (DAB) to settle disputes or not. According to the UAC-IC 2005, disputes may be referred to the DAB for them decide as to whether the Contractor rightly refuses to carry out the variation ordered (§14 (13)), a rejection of acknowledgement could reasonably be adopted (§23 (12)), the Contractor is entitled to invoke the security provided by the Employer (§23 (12)), and the quotation of a variation qualifies as reasonable (§45 (9)) (Rozemond, 2000, pp. 3-4). The DAB plays an important role in the UAC-IC 2005 procedures as the board ensures progress, prevents delays and open ends by its decision, but according to (Bleeker, 2014a, p. 603), in practice, most employers do not authorize the DAB. Conforming to (Rozemond, 2000, pp. 1-2), in Anglo Saxon countries, Alternative Dispute Resolution (ADR) like DAB differs a lot from arbitration in terms of procedures (i.e. arbitration is almost similar to litigation). In the Netherlands, that difference is much smaller and Dutch arbitration is quite similar to Anglo Saxon ADR. The difference in terms of costs is probably also smaller. Arbitration requires more procedural steps, but a DAB requires more time and money before there is even a dispute, because the members have to be updated regularly on the project. Therefore, Rozemond concludes that those little differences may be reasons why DABs are not getting off the ground in the Netherlands.

According to (Rozemond, 2000, pp. 2-3), if the DAB is authorized, the Employer may choose to make the DAB’s decisions binding or not binding. If the decision is binding, it becomes part of the contract, whereas if it is not binding, it may be referred to the court or arbitration thereafter. It seems to be logical to choose a binding decision, because the parties have had influence on the selection of the board members and agreed to them together. If the parties bring the dispute before the arbitrator, they would lose a lot of influence on the decision. However, it may be needed to keep the door open for arbitration or litigation, for example, when major disputes are expected, because arbitration or litigation allows for more time to decide than the DAB does (30 days). In practice, when the non-binding DAB’s decision is chosen, the parties mostly abide by the DAB’s decision.

If the DAB is not authorized, then pursuant to §47 (2) and (5) the disputes have to be brought before the Court of Arbitration. According to (Bleeker, 2014b, p. 716), it is remarkable that many employers amend the dispute resolution clause in order to authorize the Court to settle disputes, because case law shows that judges do not deal with the UAC-IC 2005 differently than arbitrators do. Further, he states that employers may even be worse off with such amendment as in general, the Court of Arbitration resolves disputes much quicker than the Court does.

(6) Risk allocation

The risk allocation between the Employer and the Contractor is not set out in one particular clause, but rather in several clauses. For example, §4 (10) deals with the risk of damage to works and property belonging to the Employer, §13 deals with risks regarding the geotechnical conditions, §41 deals with the risk of damage to the works, and §44 (1c) deals with the force majeure risks.

Allocation principle

Pursuant to Instruction 3.9A in (Schrijfgroep Gids Proportionaliteit, 2013, p. 52) to Art. 1.10 sub section 2 in the Procurement Act 2012, the contracting authority has to allocate the risks to the party best able to manage or to influence them. (Chao-Duvis & Wamelink, 2013, p. 46) argue that the UAC-IC 2005 do not include a principle of risk allocation. However, it seems like the risks are allocated to the party best able to manage them to a large extent. First, the risks which are related to the design and the construction of the works, such as §4 (10) damage to works and property belonging to the Employer, §13 (1 and 2) gearing work to the soil conditions, and §41 (4) damage to the works, are allocated to the party who can best influence and control them, and that is the Contractor. Second, the unknown risks neither party can control, such as §41 (4) and §44 (1c) force majeure and §13 (3-7) unknown geotechnical conditions, are allocated to the Employer. Third, the Employer (§3 (2-7)) and the Contractor (Art. 3.3 and §19.1) are responsible for everything they provide themselves, except in respect of the duty to warn of both parties (§4 (7), §20 (4), §21 (10), §22 (3) and §28 (1c)), which according to (Chao-Duvis, 2006, pp. 452-453) is in line with the views in international literature. (Chao-Duvis, 2006, p. 478) states that the risk allocation in the UAC-IC 2005 is fairer than in the FIDIC Yellow Book, because of these three aspects.

Other relevant comments found in literature:

- (Bleeker, 2014a, p. 605) argues that pursuant to arbitrators, the Employer is liable for any deviations in the geotechnical conditions if the information provided does not contain a clear indication that the Contractor should have conducted extra investigation prior to submitting his tender.
- (Bleeker, 2014a, p. 606; Herber & Keulen, 2014, p. 614) argue that, in practice, the status of non-binding information (e.g. an explanatory preliminary design) is not clear to both the Employer and the Contractor, but that pursuant to §3 (2), the Employer is also liable for deviations in the non-binding information he provides.

Unclear risk allocation

According to (Bleeker, 2014a, p. 611; 2014b, p. 716), in practice, most employers tend to amend the UAC-IC 2005 to enhance their contractual position, even if it contravenes the Procurement Act 2012 and the Proportionality Guide. For example, to cover additional risks, especially the geotechnical risks, employers often include a risk allocation as an annex to the Basic Contract. Such amendment is in conflict with Instruction 3.9C in (Schrijfgroep Gids Proportionaliteit, 2013, p. 53) to Art. 1.10 sub section 2 in the Procurement Act 2012 which states that the contracting authority has to use existing, jointly prepared General Terms and Conditions (GTC) for a certain project delivery system as the conditions are balanced for both the contracting authority and the tenderer in such GTC. In particular cases, it may be necessary to deviate from such GTC, but deviations should always be clearly motivated. Bleeker justly argues that such amendments make the UAC-IC 2005 different on every project and thus complex, inconsistent and unclear for both tenderers and employers. He mentions that the confusion about the responsibilities of both parties is the main cause of most disputes about the UAC-IC 2005. Further, Bleeker states that the parties often use risk registers during the project without aligning them with the liabilities set out in the contract, which also causes some confusion.

Even if the UAC-IC 2005 is not amended, the risk allocation between the Employer and the Contractor may lead to confusion. First, (Bleeker, 2014a, pp. 610-611) rightly argues that it is not clear if the Contractor is entitled to any compensation when the actual geotechnical conditions appear to be different than the Contractor could reasonably expect due to incomplete information from the Employer. He thinks the absence of a rule for this matter may incentivize employers to withhold geotechnical information. In addition, he mentions it is remarkable that the Contractor would be liable in case he discovers the deviation timely by means of the precautions of §13 (2), whereas the Employer is only liable if the deviation is not discovered. Therefore, Bleeker suggests to resolve this confusion by considering the soil as a 'good' provided by the Employer, so that the Employer becomes responsible for any defects in it (§3 (2)), which is in line with the traditional concept that the Employer is liable for the geotechnical conditions. Second, the UAC-IC 2005 lays down a case-specific general standard of care for determining whether the Contractor has taken all precautions that may be reasonably expected from him to prevent geotechnical problems (§13 (2)), so the requirements are quite open to interpretation. According to the Explanatory Notes to §13 (2), this means that the Contractor has to conduct sufficient and adequate soil investigation and has to adapt his design to the known geotechnical conditions insofar he was responsible for

the design. Conforming to (Chao-Duivis, 2006, pp. 470-471), such case-specific general standard of care is in line with what is considered 'reasonable' in the international literature. Third, as stated in (Bleeker, 2014b, pp. 713-714, 716; Chao-Duivis, 2006, p. 476), it is not clear what the criteria are for the entitlement to compensation and/or a time extension due to force majeure (§44 (1c)). Chao-Duivis assumes that the situation has to be as such that there is a substantial cost increase and has to be assessed on a case-by-case basis, because the UAC-IC 2005 refers to the UAC 1989 and Art. 6:258 in the DCC in which the drafters did state such criteria. Bleeker also assumes that there has to be a cost increase, because the Contractor will be compensated for all direct and indirect costs according to clause 44. However, Bleeker argues that it is still unclear whether this cost increase has to be substantial or not, since the drafters of the UAC-IC 2005 did not explain their choice for Art. 6:258 in the DCC instead of the Art. 7:753 in the DCC. The latter article is applicable to a wider scope as it does not require a substantial cost increase.

Contractor's risk allowance

The UAC-IC 2005 do not explicitly state that the Contractor receives a reward if he carries a risk, but according to (Chao-Duivis, 2006, p. 471), the Contractor may include a risk allowance for it in his price, incalculable risks should be borne by the Employer though. The Contractor may specify that risk allowance in Art. 2 in the Basic Contract.

No risk sharing

The parties do not share any risks in accordance with the UAC-IC 2005.

Discussion of change management in the UAC-IC 2005

Table 38: Assessment model for change management in the UAC-IC 2005

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	-
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	3
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	2
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	-
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	-
			(6) Update shared databases and incorporate lessons learned for project and organization	4	-
	Recognize change	Change management process	(7) Early identification of potential changes	4	2
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	3
			(9) Document the proposed change in a log	3	-
	Evaluate change		(10) Determine priority of the change	3	-
			(11) Selection of optimum change options by consulting all relevant parties	3	3
			(12) Identify the likely impacts of different change options	3	3
	Resolve change		(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	3
			(14) Communicate final change decision to all team members whose work is affected by it	3	-
			(15) Appropriate documentation to record all decisions within the change process	3	2
	Monitor implementation		(16) Monitor and record implementation	3	-
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	1.31

Overall, the change management level that the UAC-IC 2005 can facilitate is 1.31 out of 4 (see table above), which implies an informal change management level. The table below gives an overview of the efficiency and effectiveness creating aspects in the UAC-IC 2005 which are explained further per topic below the table. The change management procedure in the UAC-IC 2005 is quite efficient and effective (2), but the contract does not contain provisions for many criteria in the assessment model, which is the main cause of the low change management level. For example, there are no risk management requirements (4) and some implicit standard change management processes are not included in the change management procedure of the UAC-IC 2005 (7-16).

Table 39: Overview of efficiency and effectiveness creating aspects in the UAC-IC 2005

Creating efficient and effective CM process (score 3-4)
(2) Clear change management procedure and roles therein
(2) Option to use provisional sums
(3) To a large extent the risks are allocated to the party best able to manage them
Could be done better to create efficient and effective CM process (score 2-2.5)
(3) The Contractor may include a risk allowance to his tender price
(7) Early identification of variations due to errors, ambiguities etc. in the ER or an incomplete ER, but not due to risks.
(7-16) Some standard change management processes are not explicitly stated in the UAC-IC 2005
(8-9+15-16) Limited requirements to record all decisions in the change management process
Creating inefficient and ineffective CM process (score 1-1.5)
(3) No risk sharing
Indecisive (no score)
(1) Objectives
(4) Risk management
(5) Continuous improvement (review)
(6) Continuous improvement (share knowledge)

(3) Risk allocation

See trust criteria (6).

(2) Change management procedure

Change management procedure

The analysis of the change management procedure in the UAC-IC 2005 by means of flow charts can be found in Appendix 15. The change management procedure is dealt with in three clauses: §14 sets out the procedure for variations ordered by the Employer, §15 sets out the procedure for variations initiated by the Contractor, and §45 sets out the procedure for settling the consequences of variations ordered by the Employer. The change management procedure seems to be designed without open ends and is quite clear, but in practice, the former may not always be the case. On the one hand, the DAB has an important role in the change management procedure to prevent open ends, for example, the DAB may be asked to decide whether the Contractor's refusal to execute an ordered variation is reasonable. On the other hand, the parties are free to choose to authorize the DAB to settle disputes or not. Therefore, (Bleeker, 2014b, p. 711) rightly points out that it is remarkable that the UAC-IC 2005 do not provide alternative procedures to prevent open ends, especially because the DAB is mostly not authorized.

Pursuant to §14 (6), the Contractor may refuse an ordered variation in accordance with good faith if it causes unacceptable disruption of work or is unacceptable given the mutual interests of the parties. As stated in (Bleeker, 2014b, p. 711), these grounds for refusal are too broadly formulated and therefore cannot solve any disputes.

(Bleeker, 2014b, p. 710) rightly comments that it is unclear what is meant with the 'indirect costs' in §45 (2a) and in §44, because the Explanatory Notes do not explain it either. Bleeker assumes that the drafters imply the additional costs for running the construction site, since the variation also changes the programme and the date of completion and acceptance.

Other relevant comments found in literature:

- Conforming to (Bleeker, 2014b, p. 710), in practice, an agreement between the parties prior to the implementation of the variation is not very realistic. As the construction process needs to continue, mostly it is necessary to implement the variation before the parties have an agreement on the impact or insight into the full impact, but the UAC-IC 2005 lacks a procedure for such situation. Therefore, the parties often just draw up a written agreement which says that the Contractor is entitled to compensation.

Type of changes

The type of variations which may be ordered are set out in §14 for the Employer and in §15 for the Contractor. According to the Explanatory Notes, variations cannot be ordered by one single party to the other, but require consensus between the two parties. The UAC-IC 2005 provide strict procedures to ensure consensus between the parties and decisive answers.

Other relevant comments found in literature:

- According to (Bleeker, 2014b, pp. 709-710), §14 (3) is redundant as its content is already covered in §15. §14 (3) deals with situations in which employers refuse to order necessary variations to the Contractor's products. In practice, employers indeed often refuse such variations, but it is not limited to the Contractor's products.
- Conforming to (Herber & Keulen, 2014, p. 617), §14 (3) in combination with §45 (6) may result in a situation where the Employer is obliged to compensate the Contractor for an implemented variation which was necessary, even if the Employer has not ordered it and approved the proposal.
- (Bleeker, 2014b, pp. 709-710) argues that in practice, the Contractor puts forward much more variation requests than the Employer does as a result of construction method forced upon the Contractor, but the Employer often refuses such requests because he interprets the ER differently. Bleeker suggests to include a procedure to the contract to deal with such situations, so that the Contractor can be compensated for it.
- §15 (4) authorizes the Employer to refuse any variation requests from the Contractor without giving the reasons. According to (Bleeker, 2014b, p. 711), this sub clause is surprising, because overall, the UAC-IC 2005 is quite balanced. Bleeker concludes that the works always have to be constructed in accordance with the Employer's wishes.

Roles and responsibilities

The roles and responsibilities of both the Employer and the Contractor in the change management procedure are clearly stated in the UAC-IC 2005.

Provisional sums

According to §34 (1), provisional sums can be used for certain elements of the works which are definitely needed, but could not be priced at the time of procurement since they were not yet defined in enough detail. Therefore, provisional sums can accelerate the project. In article 15 in the Basic Contract, the Employer has to choose whether he wants to apply provisional sums or not. If he does, he has to specify the provisional sums and the elements to which these relate to in an annex to the Employer's Requirements. As stated in (Bleeker, 2014b, p. 709), the UAC-IC 2005 do not contain any other additional work arrangements, such as re-measurable quantities, a bill of quantities or open provisional sums, and there are also no reduced work arrangements to compensate the Employer, for example, when there is reduced work as a result of non-compliance with the Employer's Requirements or as a result of multiple variations.

(7) Early identification

The Contractor's warning obligation stated in §4 (7) may instigate the Contractor to scrutinize the Employer's products (i.e. the Employer's requirements, the Basic Contract, provided information etc.). Hence, any variations resulting from such scrutiny should be identified early on. The Employer has a warning obligation as well and any variations resulting from this obligation should also be identified timely. The warning obligations of the Employer and the Contractor do not apply to risks directly, so any variations needed to mitigate risks are not identified early on. The warning obligations were discussed under trust component (4).

(7-16) Change management processes

The standard change management processes are covered to a large extent in the UAC-IC 2005's change management procedure. Only the implicit ones (i.e. components (9), (10), (14) and (16)) are not explicitly covered.

(8-9+15-16) Documentation

There are no clauses which explicitly state that the parties have to record the change in a log and to record the implementation of the change, but the decisions within the change process are recorded to a large extent since notifications, decisions and quotations within the change process have to be sent in writing (§14 (1), (7-9); §45 (2), (4-5), (7) and (9)). If the Employer accepts the proposed quotation, the Contract will be adjusted in accordance with the content of the quotation (§45 (8)), so the acceptance will be recorded as well.

6.3 NEC3 ECC: trust and change management

Table 40: General data NEC3 ECC (ICE, 2005a, 2005b)

Name	NEC3 Engineering and Construction Contract
Year	2013
Components	The core clauses, the main Option clauses, the dispute resolution Option clauses, the secondary Option clauses, the Schedule of Cost Components, and the Contract Data formats
Type of contract	International contract
Origin	Common law
Project delivery systems	Complex D&B and E&C
Key principles	Flexibility, clarity and simplicity, and stimulus to good management

The NEC3 ECC was assessed by means of the assessment models of Chapter 5. The next two sub sections start with the conclusions regarding trust and change management in the NEC3 ECC, respectively. Subsequently, the conclusions were substantiated in detail. The scores and the main aspects are summarized in two tables (one for trust and one for change management) and were explained further below the tables. The explanation per topic encompasses the main findings in the NEC3 ECC and the relevant comments found in the literature. The comments which could not be verified are indicated as ‘other relevant comments found in literature’. A comparison with the other two standard forms of contract regarding the findings can be found in Appendices 18 and 19.

Discussion of trust in the NEC3 ECC

Table 41: Assessment model for trust in the NEC3 ECC

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	-
			(2) Seek party with similar culture/policy	3	-
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	3
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	2
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	3
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	2.5
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	3
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	3
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	-
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	1.5
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	3
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	1.91

Overall, the level of trust between the Employer and the Contractor that the NEC3 ECC can facilitate is 1.91 out of 4 (see table above), which implies a confident trust level. The table below gives an overview of the trust and distrust building aspects in the NEC3 ECC which are explained further per topic below the table. The most important aspects which may build trust are: clause 10.1 (act in a spirit of mutual trust and co-operation) (3+8), the option for partnering (3), the mutual early warning for risks (5), the risk reduction meetings (5), the open book requirement (5), the option for the pain/gain share mechanism (6), the option for measuring the Contractor’s performance (7+11), and the ‘standby’ DAB (10). The most important aspects which may build distrust are: the Project Manager’s dual role (5), the sanctions of the CEs time bars (i.e. lose entitlement to compensation and deemed acceptance) (10). The NEC3 ECC does not have provisions for ‘repeated fulfilment of communication’ (9) and ‘trustworthiness during procurement’ (1+2), which contributes to a lower trust level. The reason for the latter topic is that the NEC3 ECC is an international standard form of contract, while procurement law is still national law.

Table 42: Overview of trust building aspects in the NEC3 ECC

Building trust (score 3-4)
(3) Good faith in the NEC3 ECC: The parties have to take each other's reasonable interests into account
(3) Option for partnering
(3) Option for limiting the Contractor's standard of care
(5) Mutual early warning for risks
(5) Risk reduction meetings to resolve problems together
(5) Open book regarding the Contractor's cost data in Main Options C-F
(6) Option to share the financial risk by means of a pain/gain share mechanism
(7+11) Option to measure the Contractor's performance by means of KPIs and incentives
(8) The requirement for all parties to act as stated in the contract and in a spirit of mutual trust and co-operation
(8) The Project Manager may instruct the Contractor to remove members of his team from the project
(10) By default, the DAB is authorized to settle disputes. The board has to be set up before the starting date. Generally, parties often delete the DAB provisions.
Could be done better to build trust (score 2-2.5)
(3) The fitness for purpose requirement is not explicitly stated in the NEC3 ECC
(4) Extensive communication requirements, but no communication system
(5) The CE's procedure is too extensive and complicated
(6) Many risks are not allocated to the party best able to manage them as the Contractor's risks are too broadly formulated
(6) Ultimate risk allocation is unclear due to the CE's
Building distrust (score 1-1.5)
(5) The Project Manager's dual role (i.e. as the Employer's agent and as a certifier) in the CE's procedure
(10) The Contractor loses his entitlement to compensation if he does not give a CE notification in time
(10) Several deemed acceptances in the CE's procedure if the Project Manager does not reply in time
Indecisive (no score)
(1+2) Trustworthiness (ability, integrity and predictability)
(9) Communication (repeated fulfilment)

(8) Reasonable behaviour

Mutual trust and co-operation in the NEC3 ECC

§10.1 covers reasonable behaviour and states that '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) states the same thing for partners (Option X12 concerns partnering). The first part of the clause 'act as stated in this contract' is clear and implies that the parties have to adhere to the project management procedures and the time bars set out in the contract (Rowlinson, 2011, pp. 19-24). (Heaphy, 2012, p. 29) rightly argues that the NEC3 ECC strongly relies upon the compliance with the contract procedures, but that there are only a few procedures which deal with failure of such compliance. The intention of the second part of the clause 'in a spirit of mutual trust and co-operation' is quite clear, but it is not clear what it encompasses as it is open to interpretation and what its effect is. Therefore, the clause has been a main topic of discussion in the literature.

(Downing, Ramphul, & Healey, 2013, pp. 447-448) indeed state that the precise scope of the clause is not clear, but they also state that it at least prevents parties to act in bad faith or in an unreasonable manner. (Barlow, 2011, p. 5) justly argues that it is not clear how this clause influences the other provisions in the contract, but he thinks that the clause may instigate parties to resolve problems by amicable agreement. (Rowlinson, 2011, pp. 19-24) states that with some certainty can be said that if a party continues adherence to that spirit, but not at the expense of compliance project management procedures in the contract, then the outcome of any dispute will benefit this party and not the party which is acting in a different way. Further, (Heaphy, 2012, p. 25) and (Barlow, 2011, p. 5) argue that the validity of the clause is questionable since it is unclear whether the clause is legally binding and enforceable.

(Lloyd, 2008, p. 472) provides a clear answer to what the clause actually means and encompasses and what its effect is as he states: 'The ECC bridges any "gap" that may exist as a result of a common law jurisdiction not recognizing a principle of good faith (some do, e.g., in the United States) by Core Clause 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". This obligation is tantamount to one of "performance in good faith". Even if the principle of "good faith" is not part of the law governing the contract, there is no difficulty in giving effect to such a contractual requirement. For example, common law courts regularly have to decide whether the obligation of

the “utmost good faith” has been met in the insurance world. Good faith covers deciding whether someone has behaved honestly or reasonably. The phrase “mutual trust and co-operation” imports not only honesty and reasonableness but may also oblige someone to do more than the contract calls for if the contract is truly to be performed co-operatively’.

Other relevant comments found in literature:

- (Gould, 2007, p. 28) and (Heaphy, 2012, p. 25) share more or less the same view regarding this subject. They state that a contract form can merely set out a framework and cannot of itself create a spirit of mutual trust and co-operation. The creation of such spirit strongly depends on the behaviours and attitudes of the people involved. Nevertheless, Heaphy argues that the NEC3 ECC does encourage collaborative working between the parties. (Rowlinson, 2011, pp. 19-24) also states that the right attitude and behaviour both within and between the organizations involved are essential, but he also mentions some other essential factors. First, co-locating the Project Manager, the Supervisor and the Contractor is important to promote regular face-to-face communication between these parties. Second, aligning the business goals of both organizations. Third, clear and effective communication.

Influence on the Contractor's team

According to §24.1, the Contractor's key persons are stated in the Contract Data, any replacements have to be accepted by the Project Manager. So the Project Manager may check if one is able and willing to act in accordance with the spirit of mutual trust and co-operation. Further, as stated in §24.2, if the Project Manager has valid reasons (e.g. someone acts unreasonable), he may instruct the Contractor to take an employee away from the project.

(3) Project objectives

Fitness for purpose

Pursuant to §20.1, the Contractor has to provide the Works in accordance with the Works Information, but it is not clear whether the works have to be fit for purposes, because the sub clause does not explicitly state that. However, there seems to be a fitness for purpose requirement, because the Employer may choose Option X15, which limits the Contractor's liability for his design to reasonable skill and care. This is in line with what (Barlow, 2011, pp. 6-7; Downing et al., 2013, p. 451) state, they both mention that under English law, the standard of skill and care for the design under D&B contracts is fitness for purpose, whereas reasonable skill and care is required for the design under traditional contracts. In addition, Barlow argues that contractors can only insure the works against reasonable skill and care, but not against fitness for purpose, and that it is remarkable that if Option X15 is selected, the Contractor is the one who has to prove that they performed the works with reasonable skill and care.

WIN for both parties

The NEC3 ECC only explicitly states that the parties have to take the other party's interests into account when the partnering option (Option X12) is used. As stated in that Option, the Employer has to state his objective in the Contract Data and the partners have to state their own objectives in the Schedule of Partners. The partners have to work together to achieve all those objectives. When the partnering option is not applied, the parties have to do so as well, since taking each other's reasonable interests into account is part of performance in good faith (§10.1).

(4) Communication

Extensive communication requirements between the parties

The NEC3 ECC does not lay down a communication system, but it does set out rules for communication. Pursuant to §13, communication has to be in a form which can be read, copied and recorded, writing has to be in the language of the contract stated in the Contract Data, the period of reply has to be stated in the Contract Data, and a notification has to be communicated separately. This clause also sets out rules for replying to communication and the issuing of certificates. Further, the procedures set out in the NEC3 ECC are extensive and contain requirements for formal communication between the parties such as notifications and instructions. According to (Rowlinson, 2011, pp. 38-40) and (Heaphy, 2012, p. 29), if strictly followed, these communication rules and management procedures together may create an increased administrative burden. Rowlinson gives the

example that every notification has to be communicated separately and that every communication has to be in writing, thus leaving no room for face-to-face communication.

Information provided by the Employer

According to the Contract Data Part One, the Employer has to provide the Works Information (the Employer's Requirements) and the Site Information (the geotechnical information).

Ambiguities and inconsistencies in and between contract documents

Pursuant to §17, both the Project Manager and the Contractor have an early warning obligation with regard to an ambiguity or inconsistency in or between the documents which are part of the contract. The ambiguity or inconsistency will be resolved by means of a Project Manager's Instruction (PMI). For example, the instruction may consist of changing the Works Information (WI), in that case the PMI is a CE (§60.1 (1)). According to §63.8, the CE will be assessed in favour of the party which did not provide the WI.

If there is an ambiguity or inconsistency within the Site Information, then pursuant to §60.3, the Contractor has to take into account the geotechnical conditions more favourable to doing his work. (Downing et al., 2013, p. 443; Glover, 2007, p. 26) rightly argue that it is not clear, despite any risk allowances, whether the Contractor is entitled to any compensation in such case. They further argue that this sub clause may be aimed to ensure that the Contractor only prices actual risk rather than perceived risk.

(5+10) Problem-solving

Mutual early warning for risks

According to §16.1, the Contractor and the Project Manager have to give an early warning by notifying the other as soon as either becomes aware of any matter which could increase the total of the Prices, delay Completion, delay meeting a Key Date or impair the performance of the works in use. In addition, the Contractor may give an EW if something would increase his total cost. If the partnering option is applied, then pursuant to §X12.3 (3), the parties also have an early warning obligation for matters which could affect the achievement of another partner's stated objectives. §63.5 deals with the sanction for if the Contractor did not give an early warning and reads as follows:

5. 'If the Project Manager has notified the Contractor of his decision that the Contractor did not give an early warning of a compensation event which an experienced contractor could have given, the event is assessed as if the Contractor had given early warning'.

When reading this clause, it is questionable what the sanction encompasses and it even seems like the sanction is beneficial to the Contractor. The Guidance Notes to §16.1 state that the sanction is to reduce the payment due to him for a related CE and refers to §63.5. That sub clause does not explicitly state what the sanction is, but from the description one may derive that the Contractor is liable for the lost cost and time savings which the parties could have gained due to the early warning. Therefore, §63.5 sets out the rule that the event has to be assessed as if the Contractor had given early warning so that these cost and time savings can be determined. This clause is also unclear to (Lloyd, 2008, pp. 478-479), he states that 'if clause 63 contains true sanctions, whether directly or indirectly, then there must be no doubt, either commercially or legally, about their nature and extent'. Further, he rightly argues that it is not clear how the Employer can be sure of the lost cost and time savings, because it is difficult to determine the time when the early warning ought to have been given. According to (Rowlinson, 2011, pp. 42-44), in practice, the Contractor often issues a large number of early warnings. He may do this for two reasons: to help the other party in gaining foresight into potential risks or to protect himself from possible sanctions for not giving an early warning.

The NEC3 ECC does not lay down a sanction for the Project Manager for not giving an early warning. One may conclude from the Guidance Notes to §16.1 that such sanction is not necessary since it is not beneficial to the Project Manager and the Employer to withhold early warnings anyway. There is no sanction for the partnering early warning obligation either.

Collaboration and mutual help

Pursuant to §16.2, the Project Manager and the Contractor may instruct each other and other people to attend a risk reduction meeting at any time to deal with any problems or potential problems. §16.3 sets out the processes of a risk reduction meeting. Conforming to the Guidance Notes to this sub clause, the intention of the risk reduction meeting is not to decide who is responsible or who has to pay for the actions taken, but rather to co-operate to solve the problem by means of taking actions and making decisions to avoid or mitigate the effects of the identified risks on cost, time and quality. More specifically, §16.3 requires the parties to co-operate in making and considering proposals, in seeking solutions which benefit all those affected, in deciding on the actions and the action takers, and in deciding on the risk revisions.

Other relevant comments found in literature:

- As stated in (Downing et al., 2013, p. 442), the NEC3 encourages the parties to adopt a collaborative and integrated mind-set throughout the project and to work towards the shared goal of completing the project within time and budget. A fair risk allocation and the risk management procedures in the NEC3 promote the parties to do so. For example, the NEC3 requires the Contractor to price actual rather than perceived risk, and includes incentives for good performance.

Claims

Claims from the Contractor are dealt with in the form of Compensation Events (CE). The CEs procedure is set out in six clauses: §60 events which constitute CEs, §61 the process of notifying CEs, §62 the process of drawing up quotations for CEs, §63 the process of assessing CEs, §64 the process of assessing CEs by the Project Manager, and §65 the process of implementing CEs. Most comments found in literature related to claims are about whether the Contractor's time-bar and associated sanction and the deemed acceptances in the CEs procedure are reasonable. Pursuant to §61.3, the Contractor loses his entitlement to compensation if he does not notify the CE within eight weeks of becoming aware of the event. Pursuant to §61.4, if the Project Manager does not reply to the Contractor's notice of default within two weeks, then the event is deemed to be accepted as a CE and as an instruction to submit quotations. §64.4 sets out a similar rule for the assessment of CEs, if the Project Manager does not reply to the Contractor's notice of default within two weeks, then the quotation is deemed to be accepted.

Regarding the Contractor's time bar, (Rowlinson, 2011, pp. 151-152) justly argues that the existence of the compensation events clause causes uncertainty about the final price of the project. (Gould, 2007, p. 28) states that the time-bar does give the Employer some certainty about it, but also that its effect in law is still unclear. (Evans, 2010, p. 20; Lal, 2007, p. 8) expect that the number of disputes referred to the arbitrator will increase due to the sanction of non-compliance with the time-bar. Further, Evans argues that the time-bar may create a heavy administrative burden for the Contractor. On the one hand, (Evans, 2010, p. 16) rightly argues that the Contractor may find it disproportionate that he may lose his entitlement to compensation due to an action (e.g. failure) by the Employer or the Project Manager. On the other hand, (Lloyd, 2008, p. 478) states that §61.3 is correct though. He justly argues that the sanction is not unreasonable, because the Employer really has to rely on the Contractor for such events and because the time-bar is only applicable to the events the Project Manager is not obliged to notify, and that the eight-week period is not ungenerous, since the period starts when the Contractor becomes aware.

With respect to the deemed acceptances, (Downing et al., 2013, p. 447) argue that, in practice, it might be difficult to comply with the time-bars, but also that in some circumstances (e.g. §61.4) the parties are allowed to agree on longer periods. This is in line with (Ennis, 2010, p. 8). He states that on the one hand, the time-bars do encourage the Project Manager to keep the administrative work for CEs up to date, but on the other hand, in practice, the CEs tend to pile up on busy projects or come in such bulk at the same time, which creates a heavy administrative burden on both parties, but especially the Project Manager, to manage them. (Rowlinson, 2011, pp. 151-152) recognizes this as he states that it was expected that CEs would occur infrequently, but in practice, the number of CEs can be high and as a result, the strict administrative compensation events procedure may become unmanageable for both parties. Therefore, Ennis rightly argues that in such situations it is more likely that the time-bars and the deemed acceptances result in disputes, because the Project Manager may not have

had proper time to process the CE or because the accepted event does not even constitute a CE in the first place, but is merely issued by the Contractor to increase his profit.

Other relevant comments found in literature:

- The Contractor's time-bar is only applicable to events which the Project Manager is not obliged to notify. Therefore, (Downing et al., 2013, pp. 445-446) rightly argue that there is no time-bar and an associated sanction for events which the Project Manager should have notified but did not and that, in theory, it is possible that the Contractor submits late claims for such events without being penalized for it. However, they also mention that such behaviour may be in conflict with §10.1 (act in a spirit of mutual trust and co-operation) and §20.1 (provide the works in accordance with the Works Information).
- As stated in (Rowlinson, 2011, pp. 151-152), the original intention of the compensation events (CEs) clause was to ensure that the contractor carried no financial risk due to change and was therefore unaffected by the decisions of the project manager. In return, it was expected that the contractor becomes motivated to minimize time and cost overruns. However, the contractor does carry financial risk if his forecast of the impact of the CE is wrong.
- The first paragraph of §61.4 lists the grounds for refusal by the project manager to refuse events notified by the contractor. Events that do not have an effect upon Defined Cost, Completion or meeting a Key Date are not registered as a compensation event. According to (Rowlinson, 2011, pp. 189-193), recording such events in a log has its benefits for all parties as it provides a permanent record and audit trail. This log can be used when someone resurrects an event that has already been recorded and determined to have no effect.

The Project Manager's dual role

The Project Manager has an important role in the CEs procedure, because he assesses, for example, the Contractor's quotations and he may draw up his own quotation for the CE. On the one hand, the Project Manager is the Employer's agent and looks after his interests, but on the other hand, the Project Manager has such a key role in the CEs procedure. Therefore, it is questionable whether he should act impartially and fairly when assessing CEs as the NEC3 does not require him to do so. On the basis of case law (i.e. *Costain v Bechtel*), (Downing et al., 2013, p. 449; Evans, 2010, pp. 6-7, 19; Lloyd, 2008, pp. 473-475) conclude that when assessing payments and compensation events, the Project Manager is obliged to act as a certifier (i.e. act impartially between the Employer and the Contractor), and in other cases as the Employer's agent (i.e. coordinator and guardian of the client's interest). According to Lloyd, this conclusion is only valid under English common law since outside common law countries, it would be difficult to understand and to accept the Project Manager's dual role.

Open book accounting

Pursuant to §52.3 in Main Options C, D, E and F, the contract is open book regarding the Contractor's cost data. The Project Manager is allowed to check the Contractor's accounts and records at any time.

Dispute Resolution

Options W1 and W2 lay down the dispute resolution procedure. According to the Guidance Notes, Option W2 has to be applied to UK contracts to which the provisions of the Housing Grants, Construction and Regeneration Act 1996 apply. Option W1 has to be used in all other cases. Option Y(UK)2 lays down provisions related to the Housing Grants, Construction and Regeneration Act 1996. In both dispute resolution procedures, the Employer and the Contractor may refer any dispute to the DAB, and may only refer a dispute to the tribunal thereafter. The DAB consists of one Adjudicator who is jointly appointed by the Employer and the Contractor prior to the starting date of the works. The Adjudicator has to act impartially and independently of both parties. The choice of tribunal (e.g. arbitration, expert determination, a disputes resolution panel or the courts) has to be included in the Contract Data.

(Heaphy, 2012, p. 28) argues that the adjudication provisions are often removed from the NEC3 ECC since matters are often taken to arbitration or litigation anyway because the adjudicator's decision can only be enforced by mutual agreement of the parties. However, he also states that in some legal jurisdictions (e.g. the UK) the courts are likely to enforce an adjudicator's decision. (Lloyd, 2008, pp. 470-471) argues that it may be difficult to find and to select competent adjudicators and arbitrators who have good knowledge of both the ordinary construction industry practice and NEC projects.

(6) Risk allocation

There are several clauses which deal with risks. For example, §19 deals with force majeure and §80-84 set out the risk allocation between the Employer and the Contractor in which §80 states that additional Employer's risks

may be included in the Contract Data, and §81 states that the risks which are not carried by the Employer are carried by the Contractor. In addition, some CEs listed in §60.1 are due to risks. For instance, (12) unexpected physical conditions, (13) adverse weather conditions, (14) Employer's risks and (19) force majeure.

Allocation principle

It is not clear whether the risks are allocated to the party best able to manage them, because the NEC3 ECC just lists the Employer's risks, while all other risks are allocated to the Contractor. This way of dividing the risks results in a clean risk allocation, but the range of the Contractor's risks is too wide. So it is very likely that there are risks allocated to him which he cannot manage. However, the main risks are included in the NEC3 and it does seem like these risks are allocated to the party best able to manage them. The Employer's risks consists of risks which the Employer influences (e.g. design faults, use or occupation of the Site) and the unknown risks neither party can control (e.g. unexpected geotechnical conditions, adverse weather conditions and force majeure event), whereas the Contractor is liable for risks he can influence and control, such as loss of or damage to the works, plant and materials, equipment, and property.

According to (Barlow, 2011, pp. 9-10), the range of the Contractor's risks is indeed extraordinarily wide, therefore it may become highly onerous for the Contractor, for example, due to terrorism or delays in planning permits. (Downing et al., 2013, p. 443; Glover, 2007, p. 26) justly argue that §19, the force majeure clause, is too broadly formulated as well, which implies that there are many events for which the Contractor can claim an extension of time and recover additional costs and profit. Therefore, they also state that employers usually delete or amend this clause. In addition, Glover mentions that in that case, under common law jurisdictions, the Contractor would not be protected against force majeure events.

Other relevant comments found in literature:

- According to (Barlow, 2011, pp. 8-9), the Contractor is fully liable for delay in completion due to specified perils such as fires, explosions, floods, storms and the escape of water from pipes or similar apparatus, because such events are no CEs and are not covered by a construction all risks policy. In addition, Barlow argues that there are no detailed provisions which deal with loss or damage to existing structures.
- As stated in (Rowlinson, 2011, pp. 168-170), §60.2 lays down the type of information with regard to the physical conditions the contractor should have taken into account to assess a CE. There are some comments about the last two bullet points in this clause. The third bullet point refers to information, which has to be obtained by the contractor through a visual inspection of the site. The amount of information that could be obtained from such an inspection is mostly limited due to, for example, obstacles or inaccessible areas. The fourth bullet refers to other information, which an experienced contractor is reasonably expected to have obtained. It is not clear enough what other information is actually meant.
- According to (Rowlinson, 2011, pp. 168-170), §60.1 (13) sets out rules of an objective test to determine whether weather conditions constitute a compensation event. This test compares an actual weather measurement with historical weather data in order to find out if the weather conditions can be classified as unexpected (i.e. occur on average less frequently than once in ten years). There may be problems in gathering the weather data for the test as the required historical and/or actual weather data may not be available. The first bullet point of this clause states that the weather measurement must be recorded per calendar month, this may cause problems if the weather conditions do not follow the anticipated pattern while staying within the once in ten years limit. For example, one month can be extremely dry, while there is extreme rainfall in the next month causing substantial delay. However, the average total rainfall stays within the one in ten years limit, thus the contractor is not entitled to compensation. The third bullet of this clause states that the weather measurement must be recorded at the place stated in the contract data. This place may be far away from the site and therefore may not reflect the actual weather conditions on the site. In addition, the characteristics of this place may differ substantially from the characteristics of the location of the weather station.

Unclear risk allocation

At first glance, the risk allocation between the parties is quite clear since the NEC3 ECC just lists the Employer's risks and further states that the risks which are not carried by the Employer are carried by the Contractor. Conforming to (Barlow, 2011, pp. 10-12), the risk allocation is not as clear like that, because it is not clear how the risks clause interacts with the CEs clauses. The confusion is mainly caused by the fact that some CEs are actually Contractor's risks. So according to the CE clauses, the Contractor would be entitled to compensation, but according to the risks clauses, the Contractor has to indemnify the Employer for Contractor's risks. He further states that without relevant case law, the ultimate risk allocation remains uncertain.

The Contractor's risk allowance and risk sharing

The financial risk is mainly allocated through the main Options, which implies that the rewards for carrying risks are also dealt with through these Options. The NEC3 ECC provides six types of payment mechanism in the main

Options: Option A Priced contract with activity schedule, Option B Priced contract with bill of quantities, Option C Target contract with activity schedule, Option D Target contract with bill of quantities, Option E Cost reimbursable contract, and Option F Management contract. According to the Guidance Notes (ICE, 2005a, p. 14), each Option allocates the financial risk between the Employer and the Contractor differently. In the lump sum contracts (Options A and B), the Contractor carries all risks besides the Employer's risks and the CEs, and includes them in his price. In the cost reimbursable contracts (Option E), the Employer carries the financial risk. Option F is essentially also a cost reimbursable contract, but the main Options in the subcontracts also influence the risk allocation. In the target contracts (Option C and D), the financial risk is shared between the parties by means of the pain/gain share mechanism. (Ennis, 2010, pp. 6-7) mentions that the aim of such mechanism is to incentivize the Contractor to make cost-savings to increase his gain share, but in practice, it may also create an incentive for the Contractor to issue a lot of CEs to increase the target cost and thus his profit.

(7+11) Continuous improvement of the relationship

Option X20 can be applied to monitor and measure the Contractor's performance against Key Performance Indicators (KPIs). The Contractor will be incentivized by means of payments to achieve clear measurable targets. The KPIs and the associated incentives are included in the Incentive Schedule.

Discussion of change management in the NEC3 ECC

Table 43: Assessment model for change management in the NEC3 ECC

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	-
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	2.5
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	2.5
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	2.5
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	-
			(6) Update shared databases and incorporate lessons learned for project and organization	4	-
	Recognize change	Change management process	(7) Early identification of potential changes	4	3
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	3
			(9) Document the proposed change in a log	3	-
	Evaluate change		(10) Determine priority of the change	3	-
			(11) Selection of optimum change options by consulting all relevant parties	3	3
			(12) Identify the likely impacts of different change options	3	3
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	3
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	-
			(15) Appropriate documentation to record all decisions within the change process	3	2.5
	Monitor implementation		(16) Monitor and record implementation	3	-
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	1.56

Overall, the change management level that the NEC3 ECC can facilitate is 1.5 out of 4 (see table above), which implies an informal to systematic change management level. The table below gives an overview of the efficiency and effectiveness creating aspects in the NEC3 ECC which are explained further per topic below the table. The change management system in the NEC3 ECC is quite efficient and effective in terms of the open book (2), the option of the pain/gain share mechanism (3), the mutual early warning (7) and the link with risk management (4), but the change management procedure is also quite extensive and complicated (2) and the Project Manager's dual role may cause contention between the parties during the process (2). The low change management level is mainly caused by the absence of some implicit standard change management processes in the change management procedure in the NEC3 ECC (7-16).

Table 44: Overview of efficiency and effectiveness creating aspects in the NEC3 ECC

Creating efficient and effective CM process (score 3-4)
(2) Open book regarding the Contractor's cost data in Main Options C-F
(3) Option to share the financial risk by means of a pain/gain share mechanism
(4) The NEC3 ECC promotes a proactive risk management approach
(7) Early warning obligation for variations due to ambiguities in the contract documents and due to risks.
Could be done better to create efficient and effective CM process (score 2-2.5)
(2) The change management procedure is too extensive and complicated
(3) Many risks are not allocated to the party best able to manage them as the Contractor's risks are too broadly formulated
(3) The Contractor may include a risk allowance to his tender price
(4) The risk management procedure is open-ended
(7-16) Some standard change management processes are not explicitly stated in the NEC3 ECC
(8-9+15-16) Extensive requirements to record all decisions in the change management process, which may increase the administrative burden for all parties.
Creating inefficient and ineffective CM process (score 1-1.5)
(2) The Project Manager's dual role (i.e. as the Employer's agent and as a certifier) in the CE procedure
Indecisive (no score)
(1) Objectives
(5) Continuous improvement (review)
(6) Continuous improvement (share knowledge)

(3) Risk allocation

See trust criteria (6).

(4) Risk management

Risk management system and roles therein

Risk management is covered in §16. Sub clause (1) deals with the Early Warning obligation (EW) and the matters for which the Contractor and the Project Manager have to give an EW. The Project Manager records early warning matters in the Risk Register. Subsequently, pursuant to sub clause (2), the Project Manager and the Contractor may instruct each other and other people to attend a risk reduction meeting to deal with the matter or other matters for which the parties did not give an EW. Sub clause (3) sets out the processes of a risk reduction meeting in order to resolve the matter. Finally, sub clause (4) requires the Project Manager to revise the Risk Register and to instruct changes if needed. This risk management procedure contains a couple of simple steps, but it is not flawless.

With respect to the risk register, according to §11.2, the risk register consists of a description of the risk and of the actions. (Rowlinson, 2011, pp. 42-44) rightly argues that, in practice, more information must be added to the risk register in order for it to be useful, for example who identified the risk and when and what are the potential impacts.

Regarding the risk reduction meeting, as the risk reduction meeting is not mandatory after issuing an EW, (Lloyd, 2008, pp. 476-477) justly remarks that it is not clear why a risk reduction meeting is not mandatory and what the status is of matters for which the parties did issue an EW, but did not held a risk reduction meeting. Further, Lloyd is right when he states that it is not clear in the NEC3 ECC how the decisions taken during the risk reduction meeting should be reflected in the programme, since it could be done directly by the Contractor or indirectly by means of CEs.

With regard to the link with CEs, (Lloyd, 2008, p. 476) rightly states that the last sentence of §16.1 'early warning of a matter for which a compensation event has previously been notified is not required' is remarkable, because it shows that an EW notice (for matters which could happen) does not always precede a CE notice (for matters which have happened or are expected to happen), and because Section 6 does not refer to the risk register since many CEs require an EW.

Other relevant comments found in literature:

- (Rowlinson, 2011, pp. 42-44) argues that if expired risks are removed from the register (§16.4), information could get lost, so it would be better to keep these in the register in order to learn lessons from it or to create a reference for similar future projects.
- (Rowlinson, 2011, pp. 42-44) states that, in practice, people are actually having informal risk reduction meetings all the time.

Risk management approach

The NEC3 ECC promotes quite a proactive risk management approach by means of the early warning obligation and the risk reduction meeting.

(2) Change management procedure

Change management system

The analysis of the change management procedure in the NEC3 ECC by means of flow charts can be found in Appendix 16. The NEC3 ECC does not have a separate procedure for dealing with variations. Variations are dealt with through the Compensation Events procedure (i.e. the claims procedure). A variation is a Compensation Event (CE), but not all CEs are variations. The CEs procedure is dealt with in six clauses: §60 events which constitute Compensation Events, §61 the process of notifying CEs, §62 the process of drawing up quotations for CEs, §63 the process of assessing CEs, §64 the process of assessing CEs by the Project Manager, and §65 the process of implementing CEs. The change management procedure in the NEC3 ECC is quite extensive and complicated, and there are some open ends in the procedure. The latter is highlighted grey in the analysis.

According to (Lloyd, 2008, p. 475) the NEC3 lacks a mechanism for the Project Manager to revise a decision. He states that sub clause 65.2 contains an ambiguity as it is not clear as to whether a decision may be revised or not due to wrong recorded information later on. Lloyd suggests to clarify who carries the responsibility for such mistakes and when such mistakes should be revised.

Other relevant comments found in literature:

- (Downing et al., 2013, p. 448) and (Rowlinson, 2011, pp. 206-208) have noticed the importance of the programme in the NEC3 ECC. Pursuant to §50.3, the Employer is entitled to withhold 25% from any interim payments due under the contract until the Contractor has submitted a first programme to the Project Manager for acceptance. Rowlinson argues that the accepted programme is very important in the compensation events procedure as it forms the baseline to measure the adjustments to the prices, the completion date and the key dates, but that it also introduces risk for the contractor, as the accepted programme is a forecast. Downing et al. state that the importance of the programme is often not fully appreciated and that the NEC3 ECC, compared to FIDIC, sets out far more detailed and prescriptive requirements for the programme in §31.
- As stated in (Rowlinson, 2011, pp. 189-193; 206-208), a project manager or supervisor may not also notify the compensation event when giving the instruction or changing an earlier decision as he should according to §61.1. In practice, a common mistake by project managers is that they send instructions in the form of revised drawings without highlighting the revisions. The contractor is instructed to comply with the revised drawings and pursuant to §27.3 he must obey instructions by the project manager or supervisor. Such circumstances lead to delay in the compensation event procedure and inefficient use of resources as the contractor has to review all drawings to identify the changes. Subsequently, the contractor must notify every change separately as a compensation event.
- Conforming to (Rowlinson, 2011, pp. 206-208), in practice, many compensation events have such a minor time effect that it is impossible to determine. However, the cumulative effect of such compensation events combined may cause a measurable delay for which the contractor is not entitled to any compensation. The NEC3 ECC does not include a mechanism for such circumstances. This issue can be resolved by an agreement between the parties to compensate the cumulative effect of the smaller compensation events at pre-agreed intervals.

Type of changes

Variations to the works arise from an instruction or changed decision by the Project Manager or Supervisor. According to §14.3, the Project Manager is authorized to give an instruction to the Contractor which changes the Works Information or a Key Date. Variations which may be instructed are: §60 (1.1) change to the Works Information, §60 (1.8) change previous decision, §60 (6) correcting a mistake in the bill of quantities (only for Options B and D), §X12 (3.6) change to the partnering information and §X12 (3.7) change to the partners' timetable. Clause Z may be used to include other types of variations.

Roles and responsibilities

As the change management procedure is part of the CEs procedure, any problems related to the Project Manager's dual role (i.e. as the Employer's agent and as a certifier) are also applicable to the change management procedure. This aspect was already discussed under trust component (5).

Open book accounting

Pursuant to §52.3 in Main Options C, D, E and F, the contract is open book regarding the Contractor's cost data. The Project Manager is allowed to check the Contractor's accounts and records at any time.

(7) Early identification

The mutual early warning obligation in §16.1 is a tool to identify risks early on. Since risk mitigation measures may consist of changes to the Works Information, it is also a tool to identify changes which result from risks early on. Pursuant to §16.4, if a decision made in the risk reduction meeting requires a change to the Works Information, the Project Manager has to instruct the change. Changes to the Works Information as a result of ambiguity or inconsistency in or between the documents which are part of the contract should be identified early on as well by means of the mutual early warning obligation in §17. The mutual early warning obligations were discussed under trust components (4) and (5).

(7-16) Change management processes

The standard change management processes are covered to a large extent in the NEC3 ECC's change management procedure. Only the implicit ones (i.e. components (9), (10), (14) and (16)) are not explicitly covered.

(8-9+15-16) Documentation

There are no clauses which explicitly state that the parties have to record the change in a log and to record the implementation of the change, but according to §13.1, each instruction, submission, proposal, acceptance, notification, reply and other communication which this contract requires is communicated in a form which can be read, copied and recorded and the writing must be in the language of the contract, so the decisions within the change process are recorded to a very large extent. If the Project Manager accepts the proposed quotation, the Prices/ the forecast amount of the Prices, the Completion Date and the Key Dates will be adjusted in accordance with the content of the quotation (§65.3 and §65.4), so the acceptance will be recorded as well.

The change management procedure in the NEC3 ECC requires a lot of paperwork. On the one hand, it is good to create an audit trail, but on the other hand, it may create an increased administrative burden. (Rowlinson, 2011, pp. 189-193) indeed comments on the administrative burden, but also suggests an improvement. He states that the clauses §61.1 (project manager's notification of compensation events concerning an instruction) and §13.7 (notifications must be communicated separately) together may cause an administrative burden for the project manager if these two clauses are strictly followed, because according to these two clauses, the project manager must send three separate notifications to the contractor. To solve this issue the parties may decide to combine the three separate communications in one instruction form.

6.4 FIDIC YB: trust and change management

Table 45: General data FIDIC YB (FIDIC, 1999, 2000)

Name	FIDIC Yellow Book
Year	1999
Components	General Conditions, Particular Conditions, Annexes Forms of Securities, Letter of Tender, Contract Agreement and Dispute Adjudication Agreement
Type of contract	International contract
Origin	Common law
Project delivery systems	Complex D&B
Key principles	-

The FIDIC YB was assessed by means of the assessment models of Chapter 5. The next two sub sections start with the conclusions regarding trust and change management in the FIDIC YB, respectively. Subsequently, the conclusions were substantiated in detail. The scores and the main aspects are summarized in two tables (one for trust and one for change management) and were explained further below the tables. The explanation per topic encompasses the main findings in the FIDIC YB and the relevant comments found in the literature. The comments which could not be verified are indicated as ‘other relevant comments found in literature’. A comparison with the other two standard forms of contract regarding the findings can be found in Appendices 18 and 19.

Discussion of trust in the FIDIC yellow book

Table 46: Assessment model for trust in the FIDIC YB

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	-
			(2) Seek party with similar culture/policy	3	-
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	1.5
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	2
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	2
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	1.5
	Trust during project implementation	Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	-
		Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	1.5
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	-
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	1.5
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	-
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	0.91

Overall, the level of trust between the Employer and the Contractor that the FIDIC YB can facilitate is 0.91 out of 4 (see table above), which implies a low trust level. The table below gives an overview of the trust and distrust building aspects in the FIDIC YB which are explained further per topic below the table. The FIDIC YB does not contain important aspects which may lead to building trust, but the most important aspects may build distrust. Such aspects are: the parties are fully responsible for their risks (5), the unfair risk allocation (6), the lack of a good faith requirement (3+8), the Engineer’s dual role (5), the sanction of the claims time bar (i.e. lose entitlement to compensation) (10). The FIDIC YB does not have provisions for ‘repeated fulfilment of communication’ (9), ‘continuous improvement of the relationship’ (7+11), and ‘trustworthiness during procurement’ (1+2), which is the main cause of the low trust level. The reason for the latter topic is that the FIDIC YB is an international standard form of contract, while procurement law is still national law.

Table 47: Overview of trust building aspects in the FIDIC YB

Building trust (score 3-4)
(5) Option to management meetings to solve problems together
(5) Clear Employer's and Contractor's claims procedures
(8) The Engineer may instruct the Contractor to remove members of his team from the project
Could be done better to build trust (score 2-2.5)
(3) No other mutual objectives besides fitness for purpose
(4) Some communication requirements, but no communication system
(5) The parties are fully responsible for their risks (i.e. find solutions or bear the consequences)
(5) Warning obligation for errors in Employer's documents, but only early warning for risks by the Contractor. There is no sanction for failure though.
(6) To a large extent the risks are allocated to the party best able to manage them, except for the geotechnical conditions.
(6) Ultimate risk allocation is unclear due to broad formulations.
(10) By default, the DAB is authorized to settle disputes. The board may be set up from the outset or post-dispute. Generally, parties often delete the DAB provisions.
Building distrust (score 1-1.5)
(3) No requirement in the FIDIC YB to take each other's reasonable interests into account promotes adversarial behaviours
(5) The Engineer's dual role (i.e. as the Employer's agent and as a certifier) in the claims procedures
(6) No risk sharing
(8) No good faith requirement promotes adversarial behaviours
(10) Unequal treatment between the Employer and the Contractor regarding claims. The Contractor loses his entitlement to compensation if he does not give a claims notice in time.
Indecisive (no score)
(1+2) Trustworthiness (ability, integrity and predictability)
(7) Continuous improvement (system)
(9) Communication (repeated fulfilment)
(11) Continuous improvement (emotional investments)

(8) Reasonable behaviour

No good faith in the FIDIC YB

The FIDIC YB only explicitly requires the Engineer to act fairly in certain occasions. A few clauses (e.g. §3.5 and §14.6) state that the Engineer has to act fairly to determine certain matters, for example, disagreements between the Employer and the Contractor can be resolved by the Engineer's determination as many clauses refer to it. Subsequently, pursuant to §3.5, the Engineer has to make a fair determination in accordance with the contract taking into account all relevant circumstances to resolve the matter. The Engineer's dual role is elaborated under change component (2). There are no other clauses which explicitly state how the parties should act, but the term 'reasonable' is included in many clauses. For example, in §1.3, §3.4 and §4.15. (Downing et al., 2013, pp. 447-448) indeed states that there is no provision equivalent to §10.1 in the NEC3 ECC.

The term "reasonable" is not defined in §1.1. According to (Jaeger & Hök, 2010, pp. 100-114), the term is well known in common law countries, but unknown in civil law countries. Jaeger & Hök explain that 'reasonable is used in legal texts in order to express a standard of duty or the way in which a power or authorisation can or may be used' and give a few examples: 'a reasonable man is presumed to be a careful man, a man of ordinary prudence. The reasonable man is a hypothetical individual who is intended to represent a sort of average citizen or professional. Within reasonable time means within appropriate and pertinent time, within the time which is needed. Reasonable time means at any time which is acceptable. Reasonably practicable means a level of precaution taking in account of the balance between the risk involved in a particular hazard and the cost involved in remedying it. Reasonable skill and care has been judged as the standard of an ordinary man exercising and professing to have that skill which is appropriate for the task committed to him'.

Other relevant comments found in literature:

- Both (Heaphy, 2012, p. 25) and (Downing et al., 2013, p. 442) state that FIDIC contracts are often considered as adversarial contracts, which, conforming to Downing et al., means that parties are fully responsible for the risks allocated to them. Heaphy rightly argues that a contract form cannot of itself create an adversarial environment (e.g. distrust, many or large claims), since this is strongly dependent on the behaviours of the parties. However, there may be elements which promote adversarial behaviour, for example, Downing et al. mention squeezed prices and programmes through a competitive tender.

Influence on the Contractor's team

If the name of the Contractor's representative is not included in the contract, the pursuant to §4.3, prior to the commencement date, the Contractor has to submit the name and the particulars of his representative to the Engineer for approval. According to §6.9, after commencement, the Engineer may instruct the Contractor to remove members of his team from the project if there a valid reasons to do so. §6.9 reads as follows:

9. The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative if applicable, who:
- (a) persists in any misconduct or lack of care,
 - (b) carries out duties incompetently or negligently,
 - (c) fails to conform with any provisions of the Contract, or
 - (d) persists in any conduct which is prejudicial to safety, health, or the protection of the environment.
- If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.

(3) Project objectives

Fitness for purpose

Pursuant to §4.1, the works must be 'fit for purposes' when completed and must meet the 'Employer's Requirements' (ER) and the 'Contractor's proposals and schedules'. The Contracts Guide to this sub clause states that 'fitness for purpose is required, irrespective of the level of skill, care and diligence expected of the Contractor's designers, and irrespective of the likelihood that independent professional designers may be unable to procure insurance other than up to the level of the usual professional duty of skill, care and diligence'. (Chao-Duvis, 2006, pp. 463-464) justly states that it is unfair that the Contractor is fully liable for the results of the works, even though there may be parts of the works he cannot influence, for example, because the Employer determines them.

No WIN for both parties

The FIDIC YB does not require the parties to take into account each other's interests.

(4) Communication

Some communication requirements between the parties

The FIDIC YB does not lay down a communication system, but it does set out rules for communication. Pursuant to §1.3, formal communication (i.e. approvals, certificates, determinations) must be in writing and must not be unreasonably withheld or delayed. In addition, the Contractor has to draw up monthly progress reports and send them to the Engineer. The content of the reports is covered in §4.21. Further, the procedures set out in the FIDIC YB contain requirements for formal communication between the parties, such as notices and instructions. (Totterdill, 2006, p. 89) rightly argues that, in general, the Contractor has to perform his actions within a certain time period, whereas the Engineer often is not required to. For example, there is no sanction for withholding or delaying formal communication unreasonably, therefore the Contractor can only issue a claim for that.

Information provided by the Employer

Pursuant to §4.10, in the tender phase, the Employer has to provide all relevant data in his possession on sub-surface and hydrological conditions at the site (including environmental aspects). Thereafter, all new data which come into the Employer's possession has to be provided as well.

Errors and other defects in the ER

The Contractor is supposed to state in his letter of tender that he has ascertained that the ER contain no errors or other defects. (Chao-Duvis, 2006, pp. 456-457) rightly argues that it is unreasonable to shift the risks of errors in the ER towards the Contractor by means of the letter of tender, because in practice, contractors do not have much time to check the ER before submitting their tenders. Before commencement of the works, pursuant to §5.1, the Contractor is obliged to scrutinize any design criteria and calculations in the ER and the items of reference mentioned in §4.7. Any error, fault or other defect found in these documents must be notified to the Engineer. Subsequently, the Engineer determines if it constitutes a variation. The Contractor is responsible for

all errors, faults or other defects which an experienced contractor exercising due care would have discovered when scrutinizing the site and the ER before submitting his tender. After commencement, according to §1.9, the Contractor may be entitled to financial compensation and/or extension of time if he finds any other errors, faults or defects in the ER. The latter sub clause also obliges the Employer to give a notice for such errors, faults or defects. As stated in (Corbett, 1999, p. 44), it is unclear who is responsible for errors, faults or other defects in the ER, because it depends on the circumstances. Corbett argues that this ambiguity often leads to disputes.

Other relevant comments found in literature:

- According to (Bunni, 2005, pp. 555-556), prior to the start of the procurement process, it is essential to have the ER thoroughly checked by the Employer or the Engineer, because errors or forgotten aspects in the ER compromise the fitness for purpose requirement or negate it completely.
- Although it is impossible to define and describe all requirements in the contract, according to (Van den Berg et al., 2010, pp. 494-495), doing this as clearly and as complete as possible would certainly lower the probability of any disagreements about it.

(5+10) Problem-solving

Contractor's early warning for risks

§8.3 in the FIDIC YB contains an early warning provision for risks. The Contractor must notify the Engineer for future events or circumstances which may have a negative impact on the works, the costs or the programme. According to the Contracts Guide (FIDIC, 2000, p. 172), the Employer's team should also give a notification to the Contractor for such events or circumstances since it is in the Employer's interest to do so, but this obligation is not stated in the contract, because then accidental failures might be used as excuses to delay completion. According to (Totterdill, 2006, p. 180), §8.3 is indeed an early warning provision as it gives the Engineer the opportunity to mitigate the problem before it occurs. He also states that §8.3 covers much more matters and requires a much quicker notification than §20.1 (Contractor's claims) does, but the sub clauses do overlap and events may require notices under both clauses. (Downing et al., 2013, p. 445) rightly argue that there is no sanction if the Contractor fails to give an early warning, which may discourage the Contractor to give an EW and increase the importance of the claims notice.

Collaboration and mutual help

§8.3 further sets out a rule that the Engineer may instruct the Contractor to submit estimates and/or proposals under §13.3 (the variations procedure) to solve the problem. (Downing et al., 2013, p. 445; Totterdill, 2006, p. 180) rightly argue that after giving an early warning, the Contractor is not obliged to collaborate and to help in order to solve the problem. Downing et al. further state that this points out the traditional nature of FIDIC contracts as parties are fully responsible (i.e. find solutions or bear the consequences) for the risks allocated to them. Totterdill also states that in practice, the parties usually do meet to discuss and solve the problem together.

Further, the Particular Conditions include an example of an additional sub clause to §3. This sub clause (§3.6) allows the parties to have management meetings to review the arrangements for future work. Conforming to (Totterdill, 2006, pp. 118-119), this sub clause is very useful in project and should always be added. Totterdill argues that the FIDIC procedures merely requires information exchange, whereas §3.6 is far more effective as it actually requires the parties to meet and discuss a problem. He states that the management meeting could serve as an early warning meeting at which the parties can discuss solutions to overcome the problem. Further, he stresses that the management meetings are especially useful for the Contractor since the Engineer may instruct the Contractor to attend a meeting at any time.

Claims

§2.5 and §20.1 deal with claims from the Employer and the Contractor respectively. Most comments found in literature regarding this subject are about the different time-bars and the associated sanctions for notification of claims. The Contractor has to give a notice of a claim within 28 days after he became aware or should have become aware of the event and a fully detailed claim within 42 days, otherwise he will lose his entitlement to compensation and the compensation will be reduced respectively, whereas the Employer is required to give a notice as soon as practicable after becoming aware of the event (not 'should have become aware') and cannot lose his entitlement to compensation. As (Glover, 2007, pp. 12-14; Osinski, 2002, pp. 3-4; Totterdill, 2006, pp.

290-291; Wahlgren, 2002, pp. 7-8) point out, the Employer and the Contractor are treated unequally with regard to claims, because the FIDIC YB favours the Employer. According to Osinski, it is unfair that the Contractor will lose his entitlement to any compensation if he is late with submitting his notification, because in practice, he usually already has incurred costs for additional work. Osinski argues that the main function of the Contractor's time-bar is that it gives the Employer the opportunity to stop the additional works before the costs of it run up. However, she rightly gives two arguments against the onerous consequences of the time-bar. First, there is also a second time-bar of 42 days, which has a more reasonable sanction (i.e. a reduced compensation if the Engineer was not allowed the opportunity to investigate the claim) as it does not affect the Contractor's entitlement in principle. Therefore, (Totterdill, 2006, pp. 290-291) suggests to delete the sanction of the first time-bar and replace it with this one. According to Totterdill, it is not clear whether the first sanction will be enforced by the courts. (Glover, 2007, pp. 17-22) states that the sanction cannot be reversed under common law jurisdictions, but it may be possible under civil law jurisdictions due to the principle of good faith if the sanction and the conduct of both parties were unreasonable under the circumstances of the case. Further, Glover suggests that under all jurisdictions, the Contractor should never assume that the parties can resolve disputes in an informal manner, but should just submit the notice in time, because it is always difficult to convince an arbitrator or a judge to change or reverse any contractual arrangements. Second, the Employer does not have to adhere to any time-bar when submitting his claim, therefore the claims may pile up and the Contractor would have to deal with Employer's claims at the very end of the contract (Osinski, 2002, pp. 3-4). (Glover, 2007, pp. 12-14) argues that the Applicable Law might impose a time-bar on the Employer's claims and that the unequal treatment between the parties may be due to the fact that it is much easier for the Contractor to foresee any claim situations, because he is on site on a day-to-day basis. He also rightly states that it is not clear in §2.5 when the Employer has to submit the particulars of the claim since the sub-clause does not require it to be included to the notification and there is no time-bar for it either.

According to (Totterdill, 2006, pp. 290-291), in practice, the Engineer can expect many Contractor's claims many of which will not be followed by a fully detailed claim, since the Contractor will use standard forms for the notices so that he can quickly submit them for every possible event to prevent losing his entitlement to compensation.

Other relevant comments found in literature:

- (Glover, 2007, p. 16) noticed that the approach of claims is very different between FIDIC and NEC, under FIDIC the Contractor has to notify his entitlement to compensation, whereas under NEC he has to notify of an event. Another difference is that under NEC both the Project Manager and the Contractor may notify a potential compensation event. Therefore, (Downing et al., 2013, p. 444) rightly argues that NEC3's collaborative ethos extends to the claims procedure. Further, the NEC3 ECC seems to be more proactive in dealing with claims as the parties also have to notify events which are expected to happen, whereas the FIDIC YB is quite reactive and merely deals with claims which actually happened.
- (Totterdill, 2006, pp. 292-293) rightly argues that the FIDIC YB does not explicitly state when the consultations and the Engineer's determination under §3.5 and the DAB process should start. He suggests to start the consultations directly after both parties have determined their position, the Engineer's determination when either party requests it or when the Engineer considers that the time is right, and the DAB process as soon as possible. (Ndekugri, Smith, & Hughes, 2007, p. 797) rightly state that there is no explicit time-bar for the Engineer's determination, which may create an incentive for the Contractor to refer the matter to the DAB while pending the determination. They give two examples why the Contractor would do as such, he may think that the Engineer is not able to make a fair determination or to make a determination quick enough.
- (Ndekugri et al., 2007, p. 796) rightly states that it is not obvious what is meant with 'approval' by the Engineer in §20.1. He argues that if it implies that the Engineer merely accepts the Contractor's entitlement to compensation and that the parties proceed with §3.5 to determine the extent of it, then there is no time-bar for the Engineer's determination. If the approval refers to both decisions, there is the advantage of having such time-bar, but it would only be applicable to the Contractor's claims and not the Employer's claims. In addition, he argues that the latter option does not make any sense, because the §3.5 already requires the Engineer to give an approval.
- Pursuant to §2.5, the Employer can only withhold or deduct an amount due for payment to the Contractor if he follows the claims procedure. (Glover, 2007, pp. 12-14) rightly argues that this sub clause is in favour of the Contractor.
- According to (Heaphy, 2012, p. 27), in practice, contractors often consider §20.1 as an express way to issue claims, but under FIDIC the claims have to refer to other clauses in the contract.
- (Glover, 2007, p. 17) argues that if the Contractor 'should have become aware of the event' pursuant to §20.1, it may be very difficult to determine the start of the 28-day time-bar in case the claim concerns a continuous event.
- According to (Totterdill, 2006, pp. 290-291), the meaning of 'event' or 'circumstance' is questionable and their scope is unclear, therefore in practice, it is possible that the Contractor is not immediately aware of a claim situation.

The Engineer's dual role

The Engineer has an important role in both claims procedures, but his dual role in the procedures is questionable. On the one hand, pursuant to §3.1, he is deemed to act for the Employer (i.e. as the Employer's agent), except

as otherwise stated in the FIDIC YB. On the other hand, although it is not explicitly stated which sub clauses are meant with 'otherwise stated', §3.5 seems to be such an exception. The sub clause requires the Engineer to consult both parties in order to reach an agreement on the adjustments to the Contract Price and the Schedule of Payments. If there is no agreement, the Engineer has to make a fair determination in accordance with the Contract taking due regard of all relevant circumstances. Most comments found in the literature regarding this subject are about whether the Engineer is obliged to act impartially (i.e. as a certifier) when conducting such determinations. This confusion is also caused by the fact that the previous YB edition did explicitly require impartiality from the Engineer, but the drafters changed this to 'making a fair determination'.

(Ndekugri et al., 2007, p. 792; Osinski, 2002, pp. 4-5) rightly argue that the Engineer has a conflict of interests in the project, because he is appointed and paid by the Employer but at the same time has to resolve issues between the parties fairly. According to Osinski, standard practice has proven that it is a very onerous thing for anybody to treat both parties equally when being paid by one of the parties. Ndekugri et al. mention some other factors which may exacerbate that conflict of interests, the Engineer may take into account future work from the same Employer or the Engineer may also act more in favour of the Contractor due to developed relationships on previous projects (this is more likely for projects in developing countries in which both the Engineer and the Contractor are usually from the developed world). As stated in (Osinski, 2002, pp. 4-5; Totterdill, 2006, pp. 113-114), unfair Engineer's decisions may result from pressure by the Employer, but the Contractor may refer such decisions to the DAB. Osinski further states that it is questionable whether the subtle change from 'impartial' to 'fair' actually changed the way the Engineer ought to act. (Ndekugri et al., 2007, pp. 794-795) compared the definitions of 'impartial' and 'fair' in the Oxford English Dictionary, and conclude that the terms have considerable overlap in meaning. Further, Ndekugri et al. rightly stress that 'impartial' applies to the Engineer's behaviour, whereas 'fair' applies to the Engineer's decision.

(Corbett, 1999, p. 42; Ndekugri et al., 2007, p. 796) rightly question whether the Engineer's decision always has to be fair since it is not required as many clauses do not refer to §3.5. Corbett suggests that the FIDIC YB should include a general obligation saying that an Engineer's decision has to be fair in all aspects. Ndekugri et al. further state that any unfair Engineer's decision will most likely be corrected when referred to the DAB or arbitrator.

Other relevant comments found in literature:

- According to (Ndekugri et al., 2007, pp. 796-798), the FIDIC YB's structure is flexible as such that it is possible to ensure that the Engineer acts merely as the Employer's agent by means of amendments to the contract or control over the Engineer through specification of the Engineer's authority (§3.1). However, (Ndekugri et al., 2007, p. 796) rightly states that the latter could cause delays in processing Contractor's claims.
- (Jaeger & Hök, 2010, pp. 222-223; Ndekugri et al., 2007, p. 792) state that, even though it is not explicitly stated and it may cause a conflict of interests, the Engineer has to act independent and impartial in common law systems, whereas such requirement is unknown in continental and other civil law systems. In the latter systems, the Engineer ought to behave as the Employer's agent in all aspects.
- According to (Ndekugri et al., 2007, p. 795), the part 'consult with each party in an endeavour to reach agreement' in §3.5 is open to interpretation, but in any event it requires the Engineer to take on a more proactive approach. They give two possible interpretations: the Engineer may make a draft determination, discuss it with the parties and take into account the feedback when making the final determination, or the Engineer may act as a sort of mediator or conciliator. They further state that in the latter case, it is essential for effectiveness and integrity of the process that the Employer is able to collect project information and to determine a clear position on the matter of interest independent of the Engineer.

Dispute Resolution

If the parties have not come to an agreement after the Engineer's determination process, then the dispute may be escalated to the Dispute Adjudication Board (DAB). According to (Totterdill, 2006, p. 301), disputes may also be referred to the DAB directly unless the contract lays down a procedure for the subject. The DAB may be set up from the outset, but also after a dispute arises. If the dispute is still not resolved, it may be referred to arbitration. The procedures and rules for this escalation process are included in §20 and in the Appendix to Tender.

Regarding the setup of the DAB, (Totterdill, 2006, p. 297) argues that it is essential that the Board members have appropriate knowledge of the construction industry, claims and dispute resolution, contract interpretation and the DAB procedures, that the members act as a team rather than as representatives of the parties, and that the

experience and professional expertise is balanced within the team. At first instance, a post-dispute DAB seems to save money, but the contrary is also possible as it has big disadvantages. (Jaynes, 2000, pp. 43-45; Totterdill, 2006, p. 295) rightly argue that it would be more difficult for the parties to agree to establish a DAB after a dispute has arisen and negotiations have failed. According to them, the disadvantages of a post-dispute DAB are: the DAB cannot prevent disputes, the introduction of the DAB will be delayed, the DAB needs time to get familiar with the context of the dispute, and the DAB has to rely much more on records and witnesses rather than their own observations.

The Particular Conditions include an example of an additional sub clause to §20.2 in which the Engineer shall act as the DAB. In that case, he will be paid by the Employer and act fairly and impartially. (Ndekugri et al., 2007, p. 798; Totterdill, 2006, pp. 288, 303) rightly argue that it would be very difficult for the Engineer to perform DAB duties as he already has made his decision under §3.5 and is paid by the Employer. Therefore, Totterdill does not recommend to appoint the Engineer to act as the DAB. Further, Ndekugri et al. stress two other concerns, the Engineer may not adhere to the rules of natural justice, and the Engineer may not act fairly and impartially. According to Ndekugri et al., the Engineer as DAB is only appropriate if the relationship between the Employer and the Contractor is good, both parties have the intention to adhere to the Engineer's decision and trust the Engineer in terms of professionalism, competence, impartiality and integrity.

Other relevant comments found in literature:

- Pursuant to §20.4, if either party is dissatisfied with the DAB's decision, they may issue a notice of dissatisfaction. Subsequently, there is a 56-day amicable settlement period and the parties may only commence arbitration thereafter (§20.5). According to (Totterdill, 2006, p. 303), it may be better to postpone arbitration until the construction has been completed, so that all disputes can be settled in a single arbitration.
- According to (Heaphy, 2012, p. 28), the adjudication provisions are often removed from the FIDIC yellow book since matters are often taken to arbitration or litigation anyway, because the adjudicator's decision can only be enforced by mutual agreement of the parties, but in some legal jurisdiction (e.g. the UK) the courts are likely to enforce an adjudicator's decision.

(6) Risk allocation

The risk allocation is covered in several clauses, for instance, in §4.10 site data, §4.12 unforeseeable adverse physical conditions, §8.4 exceptionally adverse climatic conditions, §17 damage or loss and §19 force majeure.

Allocation principle

The risks seem to be allocated to the party best able to manage them. The Contractor is liable for the risks he can influence and control, such as §4.10 the interpretation of the site data, §4.12 foreseeable physical conditions, §17.1 property damage due to Contractor's fault and §17.2 care of the Works and Goods until take-over. The Employer carries the risks he can influence and control, such as §17.1 property damage due to Employer's fault and §17.3 design by Employer. Further, the unknown risks neither party can control are carried by the Employer, such as §4.12 unforeseeable physical conditions, §8.4 exceptionally adverse climatic conditions, §17.3 damage or loss due to e.g. war or terrorism and §19 force majeure.

Pursuant to §4.10, the Employer has to provide the site data, but the Contractor is responsible for the interpretation of it and for obtaining all other necessary information. §4.12 lays down the risk allocation regarding Physical Conditions. The risk of Unforeseeable Physical Conditions at the Site is borne by the Employer, whereas the risk of Physical Conditions which are foreseeable at the Site or are outside the Site is borne by the Contractor. Pursuant to the Contracts Guide to §4.12, the risks of errors in the site data and of unforeseeable geotechnical conditions (e.g. natural sub-surface conditions, natural and artificial physical obstructions and the presence of chemical pollutants) are allocated to the Employer. According to (Corbett, 1999, p. 41; Totterdill, 2006, p. 135), many claims and disputes in construction projects are caused by unforeseeable physical conditions and the definition of unforeseeable stated in the FIDIC YB (i.e. 'not reasonably foreseeable by an experienced contractor by the date for submission of the tender'). Totterdill states that the parties often disagree about whether the problem should have been expected and included in the Contractor's price and whether the actual situation could have been foreseen by an experienced Contractor. He suggests that the Employer should be liable for all problems at site, because he chose the site.

Pursuant to §8.4, the Contractor is entitled to an extension of time for exceptionally adverse climatic conditions. (Downing et al., 2013, p. 443) rightly argue that term ‘exceptionally adverse climatic conditions’ is not clearly defined and is too general and open to interpretation.

The Employer bears the risk of Force Majeure and the Contractor may be entitled to an extension of time and/or financial compensation if he is prevented from performing any of his obligations under the contract due to Force Majeure (§19). §19.1 defines a force majeure event and also lists some examples of it. As (Glover, 2007, pp. 22-24; Wahlgren, 2002, p. 5) point out, the definition is too broad. Therefore, Wahlgren suggests that the Employer should include an exclusive lists of force majeure events to the contract and to share the risk with the Contractor. Further, Glover states that force majeure events are covered under civil law jurisdictions as well, but not under common law jurisdictions. Therefore, he justly argues that the Employer should check the compatibility between §19 and the law governing the contract in order to prevent any overlap or contradiction.

Other relevant comments found in literature:

- (Downing et al., 2013, p. 445) state that the parties are fully responsible (i.e. find solutions or bear the consequences) for the risks allocated to them.
- According to (Chao-Duivis, 2006, p. 478), the risk allocation in the UAC-IC 2005 is fairer than in the FIDIC Yellow Book, because to a larger extent the UAC-IC 2005 allocate risks to the party best able to manage them, allocate all unknown risks to the Employer and also hold both parties responsible for the things they provides themselves, but it does take into account both warning obligations.
- As stated in (Osinski, 2002, pp. 2-3), in practice, the Employer, on the one hand, often force amendments to the contract upon the Contractor, but on the other hand, is mostly also reluctant to accept requested amendments if they are favourable to the Contractor. Regarding the latter, she mentions that the Employer often uses the FIDIC YB’s balance of risk as an argument to refuse such requests from the Contractor, but also that the Contractor has to be wary of that, because some clauses in the FIDIC YB are definitely in favour of the Employer.
- According to (Chao-Duivis, 2006, pp. 473-475; Van den Berg et al., 2010, p. 497), the FIDIC YB’s provision on geotechnical conditions allocates the unforeseen risks (i.e. not anticipated for whatever reason) regarding the geotechnical conditions to the Contractor rather than the Employer, which is not in line with the international standard. Chao-Duivis states that such risks are difficult to insure against for the Contractor, therefore it results in a higher tender price.

Unclear risk allocation

§17 includes some sub sections on risk allocation between Employer and Contractor. (Bunni, 2005, pp. 103-104) rightly argues that the headings of §17 ‘risk and responsibility’ and of §17.3 ‘Employer’s risks’ are confusing, because they only deal with the risks of loss and damage and not with the whole range of risks.

The Contractor’s risk allowance

Pursuant to the sixth paragraph of §4.12, the Engineer may reduce the Contractor’s compensation for adverse physical conditions if other physical conditions in similar parts of the works were more favourable than foreseen, but all reductions together may not result in a net reduction in the Contract Price. As stated in (Corbett, 1999, p. 41; Wahlgren, 2002, p. 7), this paragraph of §4.12 is favourable to the Employer. Corbett further states that the sub clause encourages the Employer to look for such reductions and that the definitions of ‘similar parts’ and ‘more favourable’ become more important.

No risk sharing

The parties do not share any risks in accordance with the FIDIC YB.

Discussion of change management in the FIDIC yellow book

Table 48: Assessment model for change management in the FIDIC YB

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	-
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	2
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	1.5
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	1
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	-
			(6) Update shared databases and incorporate lessons learned for project and organization	4	-
	Recognize change	Change management process	(7) Early identification of potential changes	4	2
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	3
			(9) Document the proposed change in a log	3	-
	Evaluate change		(10) Determine priority of the change	3	-
			(11) Selection of optimum change options by consulting all relevant parties	3	-
			(12) Identify the likely impacts of different change options	3	3
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	3
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	-
			(15) Appropriate documentation to record all decisions within the change process	3	2
	Monitor implementation		(16) Monitor and record implementation	3	-
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	1.09

Overall, the change management level that the FIDIC YB can facilitate is 1.09 out of 4 (see table above), which implies an informal change management level. The table below gives an overview of the efficiency and effectiveness creating aspects in the FIDIC YB which are explained further per topic below the table. The change management procedure in the FIDIC YB is quite straightforward (2), but also open-ended sometimes. The low change management level is mainly caused by the limited risk management requirements (4), the absence of some implicit standard change management processes in the change management procedure in the FIDIC YB (7-16), and the Engineer's dual role which may cause contention between the parties during the process (2).

Table 49: Overview of efficiency and effectiveness creating aspects in the FIDIC YB

Creating efficient and effective CM process (score 3-4)
(2) Option to use provisional sums
Could be done better to create efficient and effective CM process (score 2-2.5)
(2) The change management procedure is open-ended sometimes
(3) To a large extent the risks are allocated to the party best able to manage them, but the parties are fully responsible for them
(3) The Contractor may include a risk allowance to his tender price
(7) Early identification of variations due to errors, ambiguities etc. in the ER or an incomplete ER, but ineffective early identification requirement of variations due to risks because there is no sanction for it
(7-16) Some standard change management processes are not explicitly stated in the FIDIC YB
(8-9+15-16) Limited requirements to record all decisions in the change management process
Creating inefficient and ineffective CM process (score 1-1.5)
(2) The Engineer's dual role (i.e. as the Employer's agent and as a certifier)
(3) No risk sharing
(4) Very limited risk management procedure
(4) The FIDIC YB promotes a reactive risk management approach
Indecisive (no score)
(1) Objectives
(5) Continuous improvement (review)
(6) Continuous improvement (share knowledge)

(3) Risk allocation

See trust criteria (6).

(4) Risk management

Risk management system and roles therein

The FIDIC YB does not contain a risk management procedure, it merely contains an early warning provision in §8.3. There is no sanction for not giving an early warning. The only follow-up process set out in the FIDIC YB after an early warning is that the Engineer may instruct the Contractor to submit estimates and/or proposals under §13.3 (the variations procedure) to solve the problem (§8.3).

Risk management approach

The early warning provision in §8.3 is intended to promote a proactive risk management approach, because an early warning allows the Engineer to take action to mitigate or reduce the problem. However, it does not seem that the early warning obligation would work effectively, because the obligation does not contain a sanction for if the Contractor fails to give an early warning. The claims notice, on the other hand, does seem to work, because if the Contractor does not give a notice within 28 days after becoming aware of the event, he would lose his entitlement to any compensation for it. However, as stated in (Heaphy, 2012, p. 30), the claims procedure deals with matters quite retroactively.

(2) Change management procedure

Change management system

The analysis of the change management procedure in the FIDIC YB by means of flow charts can be found in Appendix 17. The change management procedure is set out in §13. Variations can be initiated by any of three ways: an instruction of the Engineer, a proposal of the Contractor or a request for a proposal of the Engineer. The procedure for dealing with variations depends on the way the variation was initiated, therefore three different procedures can be distinguished. Overall, the change management procedure is pretty straightforward, but it is not flawless. One of the flaws is the many open ends, which are highlighted grey in the analysis. (Totterdill, 2006, p. 118) rightly states that there is no explicit time limit for the Engineer's determination (§3.5), but §1.3 does set out a rule that the determination should not be unreasonably withheld.

Other relevant comments found in literature:

- According to (Jaeger & Hök, 2010, pp. 266, 279), it is better to prepare clear and unambiguous contract documents to avoid variations, but in practice, employers usually try to avoid variation by not defining the ER too much and rather only specify the main objectives and targets. In the latter case, there will be detailed Engineer's instructions to achieve those objectives and targets, but these will less likely constitute a variation as it would not change the ER or the Works.

Type of changes

The FIDIC yellow book does not include a list of possible Variations which the Engineer is entitled to order. In §1.1 a variation is defined as 'any change to the Employer's Requirements or the Works, which is instructed or approved as a variation under §13'. Pursuant to §3.1 and §13.1, the Engineer may instruct a variation or request a proposal for a variation on behalf of the Employer. (Chao-Duvis, 2006, p. 467) states that there is no clear limit for the Employer or Engineer to instruct variations. According to §13.2, the Contractor may only propose variations resulting from value engineering (i.e. variation which accelerate completion, reduce the cost to the Employer of executing, maintaining or operating the Works, improve the efficiency or value to the Employer of the completed Works, or otherwise be of benefit to the Employer). In the Red Book, the Contractor will receive 50% of the benefits of the value engineering solution, but such incentive does not exist in the Yellow Book. As stated in (Van den Berg et al., 2010, p. 499), Employers have to be wary of applying such incentives, because Contractors may hold back cost-saving alternatives in their tender proposals so that they can submit them later on in the project to gain the 50% of the benefits. In addition, (Totterdill, 2006, p. 224) rightly argues that the Contractor is not really encouraged to put forward value engineering proposals, because he has to prepare them at his own cost. The costs may be substantial, but may not be compensated.

Roles and responsibilities

As the 'Engineer's fair determination' of §3.5 is part of the change management procedure as well, any problems related to the Engineer's dual role (i.e. as the Employer's agent and as a certifier) are also applicable to it. This aspect was already discussed under trust component (5).

Provisional sums

According to §13.5, provisional sums can be used for certain elements of the works which are definitely needed, but could not be priced at the time of procurement since they were not yet defined in enough detail. As stated in (Totterdill, 2006, pp. 227-228), such provisional sums can only be spent on specified purposes, therefore if parties want to make use of open provisional sums (i.e. contingencies), they have to clearly define them in the Particular Conditions.

(7) Early identification

The Contractor's early warning obligation in §8.3 is a tool to identify risks early on. Pursuant to this sub clause, a given early warning may require the Engineer to instruct the Contractor to submit estimates and/proposals under §13.3 (the variation procedure), so it is also a tool to identify changes which result from risks early on. However, as stated under component (4), it does not seem that the early warning obligation would work effectively without a sanction. Changes which result from errors in the ER and other contract documents are required to be identified early on as stated in the Letter of tender, §5.1 and §1.9. The latter sub clause also obliges the Employer to give a notice for such errors, faults or defects. The early warning obligations were discussed under trust components (4) and (5).

(7-16) Change management processes

The standard change management processes are covered to a large extent in the FIDIC YB's change management procedure. Only the implicit ones (i.e. components (9), (10), (11), (14) and (16)) are not explicitly covered.

(8-9+15-16) Documentation

There are no clauses which explicitly state that the parties have to record the change in a log and to record the implementation of the change, but according to §3.3, §13.2 and §13.3, the Engineer's instructions have to be in writing and the Contractor's response and proposal as well. In addition, §1.2 states that agreements have to be recorded in writing and states what is meant with 'in writing' and §1.3 states that approvals, consents, determinations, notices and requests have to be given in writing too. So the decisions within the change process are recorded to a large extent. Pursuant to §3.5, each party has to give effect to each agreement or determination unless and until it is revised by the DAB or the arbitrator or the court, which also should be recorded.

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IV. Comparative case study

7 Assessment of the case study projects

8 Comparative analysis

9 Discussion

7. Assessment of the case study projects

This chapter deals with the fifth sub question: To what extent do the case study projects A+B, C and D in which the UAC-IC 2005, the NEC3 ECC and the FIDIC YB were applied respectively meet the set of assessment criteria and correspond to the assessment results of question 4? The objective of this sub question is to assess the case study in terms of trust and change management by means of the assessment models in order to validate the effectiveness of the contract clauses regarding trust and change management, to research the effectiveness of the project management systems and tools used on the projects with respect to trust and change management, and to research the influence of trust on the change management process on the projects. The first sub section discusses how the four case study projects were chosen and how the data was collected, analysed and assessed. The four sub sections thereafter deal with the most important trust/distrust building aspects and the most important efficiency and effectiveness creating aspects on the projects Bijlmerweide, Drachtsterweg, Forres and Dikkowita respectively.

7.1 Setup of the assessment of the case study projects

Selection of the projects

At first instance, three case study projects were selected for this research, one for each standard form of contract. The following criteria were applied to select these projects:

- UAC-IC 2005, NEC3 ECC or FIDIC YB contract
- Design & Build
- Complex infrastructure project (medium-large in project size) > Rijkswaterstaat applies 6 categories in terms of project size:
 - Extra Small < 5 million €
 - Small: 5-15 million €
 - Medium: 15-35 million €
 - Large: 35-100 million €
 - Extra large: > 100 million €
 - Mega: > 500 million €
- Preferably live project, otherwise recently completed
- Public client
- Access to the project records
- Access to the contact details of both the Employer's and Contractor's team
- The Employer's and Contractor's willingness to do the interview

It took a while to find suitable case study projects which matched all these criteria. For all contracts it was difficult to find a live infrastructure project with sufficient size. For the NEC3 ECC and the FIDIC YB it was extra difficult since the projects in which these contracts are applied were limited and could only be found abroad. Most live FIDIC YB projects in which RHDHV is involved could not be used for the case study, because the parties were not willing to co-operate. Some of these projects were subject to a series of ongoing claims between the Employer and Contractor and for other projects RHDHV signed a confidentiality agreement. The search concluded with three medium-large-sized infrastructure projects which were ongoing or recently completed: project Drachtsterweg (UAC-IC 2005, €33 million, the Netherlands), project Forres Flood Alleviation Scheme (NEC2 ECC, €37 million, Scotland) and project Dikkowita Fishery Harbour (FIDIC YB, €44 million, Sri Lanka).

After the selection of these projects, it was decided to select an extra small-sized live infrastructure project as a pilot case study project to test the data collection and analysis methods. This pilot case study project is project Bijlmerweide (UAC-IC 2005, €1 million, the Netherlands). Due to the availability of the interviewees and the scheduling the face-to-face interviews, it became impossible to use this project as a pilot case study project, because there was not enough time to analyse this pilot case study prior to the main case study project interviews. Therefore, it was decided to add this pilot case study project to the main case study as the fourth project. The NEC3 ECC and the FIDIC YB are specifically meant for non-straightforward (i.e. high project complexity) D&B projects, whereas the UAC-IC 2005 is applicable to all types D&B projects ('one size fits all'). Therefore, this additional case study project may also demonstrate some interesting differences compared to the larger sized UAC-IC 2005 case study project.

Cultural differences

The case study projects are located in three different countries. The three countries are quite different with regard to the Power Distance Index (PDI), Individualism versus Collectivism (IDV), and Masculinity versus Femininity (MAS), whereas the other cultural dimension scores are more or less the same (Figure 13). The cultural characteristics were taken into account in the data analysis. The characteristics of the Dutch culture, the British culture and the Sri Lankan culture can be found in Appendices 24&27, 30 and 34, respectively.

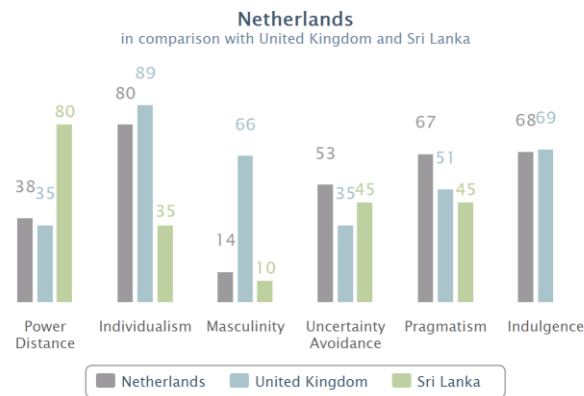


Figure 13: Cultural differences between the Netherlands, the United Kingdom and Sri Lanka (Hofstede, 2015)

Data collection: interview protocol

The data for the case study was collected by means of face-to-face interviews and written questionnaires. An interviews protocol was used which is based on the generic interview protocol for probing interviews by (Stewart & Cash, 2008, pp. 105-139). This protocol consists of the following steps:

Preparing the interview

Determining the purpose

- The objective of the interviews with the Employer and the Contractor is to validate the analysis of the standard forms of contract and the project records by researching how certain contract clauses and project management systems work in practice.

Researching the topic

- Literature study: Trust and change management
- Literature study: The UAC-IC 2005, the NEC3 ECC (and the NEC2 ECC) and the FIDIC YB clauses on 'trust' and 'change management' and comments found in literature on these clauses
- Documents study: The project records of the case study projects

Structuring the interview (see Appendices 23, 26, 29, 32 and 33 for the questionnaires)

- Opening: brief introduction (role on the project), explain the research (subject, case study design) and explain the interview setup (goal, duration, setup of the questions)
- Body: Semi-structured interview with primary open questions and several probing questions. The questions are directly linked with the criteria of the assessment models. The questions about 'trust' and 'change management' are separated from each other. Every question starts with an introduction in which is indicated what was found in the standard form of contract or the project records with regard to the criteria. The introduction is followed by a couple of questions. Most questions were set up as YES/NO questions due to accuracy and efficiency, but the interviewee had to substantiate his answer. Further, there were additional questions about these two subjects which were asked irrespective of the case study project.
- Closing: explain the data analysis, explain the validation process, various (additional questions by email, remarks on the interview, anonymity)

Selecting the interviewees (see Appendix 21 for list of interviewees)

- First round: people who are directly involved in the trust building and change management processes of the selected case study projects. These positions are usually filled by contract managers, project managers, process managers and specialists (for e.g. contract, variations and risks). Further, people who are not involved on a day-to-day basis, but only manage things on the strategic level. These positions are usually filled by project directors. For each project, interviewees were selected from both the Employer's and the Contractor's team, except for the Dikkowita project.
- Second round: The number of interviewees of the Dikkowita project was limited. Therefore, to validate the answers gives by them, a written questionnaire was drawn up with regard to the FIDIC clauses on 'trust' and 'change management'. This questionnaire was sent out to FIDIC experts and FIDIC Engineers.

Conducting the interview

- The face-to-face interviews of the first round were held in September – October 2014. There was only one interview by means of a written questionnaire in this round. A couple days prior to the interview, an agenda was sent to the interviewee (see Appendix 22 for an example). The interviews for project Bijlmerweide were held first as this was supposed to be the pilot case study project. Then, project Drachtsterweg followed shortly after and overlapped a bit with the Bijlmerweide projects. The Dikkowita interview was scheduled near the end of the first round. As there was only one interviewee, it was important that the interview structure was tested and the interview skills were practiced. The latter was also applicable for the Forres project, because these interviews were held in Scotland. The interviews for the Forres project were held last. All construction sites were visited, except for the Dikkowita project.
- The written questionnaires of the second round were sent out and received in November 2014 – January 2015.

Validating the interview

- The author has written reports for each face-to-face interview (see Appendices 24, 27, 30 and 34) by means of the interview notes and recordings, which summarize the important points per criteria. These reports were sent to the interviewees so that they could check it, adjust it if needed and approve it. If the interviewee did not reply within two weeks, the interview report was deemed to be accepted. Some interviewees did reply, others did not. The validation dates are written on the reports.

Data analysis: assessment of the case study projects

The assessment of the case study projects contains the following steps:

1. Compare and summarize the interview answers per project and per criteria by means of the analytic tactic 'counting' by (Miles, Huberman, & Saldaña, 2013, pp. 282-284). The interviewees were numbered and labelled by party. All interview reports can be found in Appendices 24, 27, 30 and 34 and the summaries of them in Appendices 25, 28, 31 and 35. The summaries includes statements by the interviewees, and show which interviewees and how many made the statement. An example from project Drachtsterweg:
'6/10 interviewees (#2E, #4P, #5P, #7C, #8C and #9C) state that the Employer and the Contractor did not align the objectives regarding the results'.
2. Use the interview summaries to assess the case study projects in terms of 'trust' and 'change management' by means of the maturity models (Appendices 9 and 14). The assessments can be found in Appendices 25, 28, 31 and 35. The tables below give an example of a filled out assessment model and a part of the maturity model which is used to determine the scores. In this manner, all trust and change management criteria were given a score from level 1-4 per contract. The filled out assessment models give a clear overview of the strong and the weak points of the project. The total trust level and change management level on the project were calculated by taking the average score of all scores.

Table 50: Example of a filled out assessment model for trust

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	1.5
			(2) Seek party with similar culture/policy	3	1.5
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	3
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	2.5
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	1.5
	Trust during project implementation	Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	2
		Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	2
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	2
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	2
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	2
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	2

Table 51: Example of a filled out maturity model for trust

Criteria	Topic	Sub Topic	Level 1 Low trust relationship	Level 2 Confident trust relationship	Level 3 High/strong trust relationship	Level 4 Complete trust relationship
(3)	OBJECTIVES	Objectives alignment	Only self-objectives	Mainly self-objectives	Mutual objectives in a project	Mutual objectives in the long-term
		Benefits	Win-Lose	Win-Partial win	Win-Win in a single project	Win-Win in the long-term

3. Use the scores in the assessment model to categorize trust building and efficiency and effectiveness creating aspects found and display them on an overview table to show the strong and weak points. The overview tables for 'trust' and 'change management' are placed in the appendix as well, after each assessment. Some topics were divided into sub topics. The sub topics are classified in accordance with their sub topic score in the maturity model. See the tables above and below for the example of criteria (3). The aspects in the overview tables have a number (#) that indicates to which criteria in the assessment model they are related. The tables may also include aspects which are not covered by the maturity model. A 'bold' written aspect means that it is related to a condition of contract, and an 'italic' written aspect implies that it is an amendment to the contract.

Table 52: Example of an assessment overview table for trust

Building trust (score 3-4)
(3) Focus on the target in terms of the programme mainly due to bonuses and fines
Could be done better to build trust (score 2-2.5)
(3) No other mutual objectives besides fitness for purpose, therefore the objectives remained contradictory
(3) The Employer wants a higher quality product than the Contractor is delivering, therefore the Employer often refers to the contract.
(3) The collaboration agreements (openness, focus on the target, timeliness etc.) are quite standard and are not fully effective due to contradictory interests
(3) Win-partial win situation due to lowest price tender
(3) The overlap between the design phase and the construction phase does not run smoothly
Building distrust (score 1-1.5)
-

4. Derive the most decisive trust building and efficiency and effectiveness creating aspects from these tables per project. There was a large amount of data, this way the main causes could be distinguished from the other causes. With regard to the trust aspects, the author noticed that these decisive aspects could be divided into five clusters: procurement, contract, people, process and product. This analytic tactic 'clustering' by (Miles et al., 2013, pp. 279-280) was also useful to compare the four case study projects in the next chapter. The most decisive aspects were described per project in the following four sub sections (7.2-7.5). An example from project Dikkowita:

Product

	score
(3) The Contractor was delivering a high quality product	3
(3) Major scope change at the beginning and the 'final scope agreement' was only reached near the end of the project.	2
(3+10) The Contractor withdrew from the bridge-road solution and did not finish the job.	2
(3+10) The Employer did not have many resources (e.g. sanctions or incentives) to control the Contractor.	2
(3) At the end of the project, there was most likely no WIN situation for all parties anymore due to the scope change (i.e. harbour also suitable for large ships) and the disputed bridge-road connection.	2

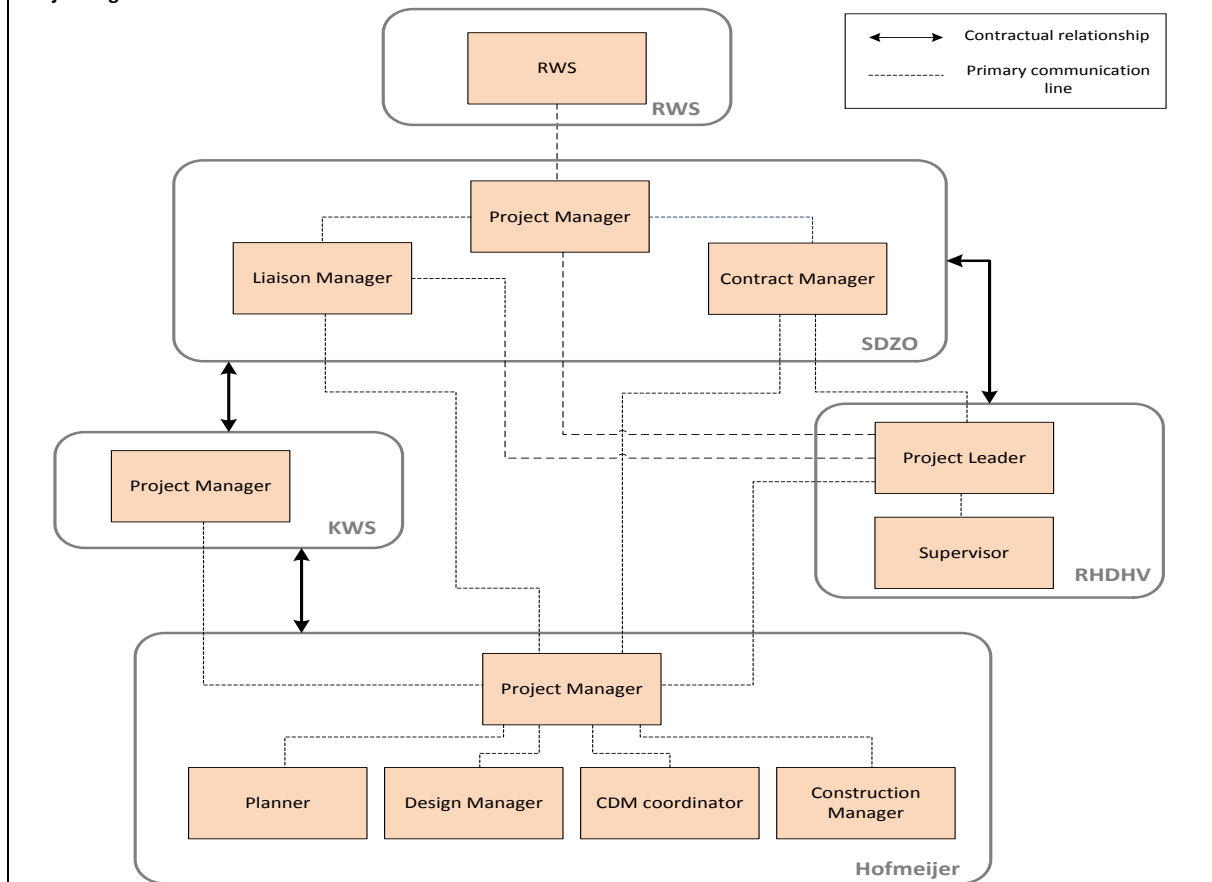
5. Determine the amount of influence of the contract on the trust level and the change management level per project. This was done on the basis of the 'bold' and the 'italic' written aspects in the overview tables.
6. Determine which other factors had much influence on the trust level and the change management level per project.
7. Derive the direct and the indirect links between trust and the change management process from the assessment data by means of the analytic tactic 'seeing plausibility' by (Miles et al., 2013, pp. 278-279). These links were described per project at the end of the following four sub sections (7.2-7.5).

7.2 UAC-IC 2005: Project Bijlmerweide

Table 53: General data project Bijlmerweide (Gemeente Amsterdam Stadsdeel Zuidoost, 2014a, 2014b; KWS & Hofmeijer, 2014; Royal HaskoningDHV, 2014)

Project name	Waterberging Bijlmerweide
Location	Amsterdam, The Netherlands
Contract	UAC-IC 2005
Law	Dutch Law
Project delivery system	Engineering & Construct (E&C)
Employer	Gemeente Amsterdam Stadsdeel Zuidoost (SDZO)
Contractor	KWS Infra
Subcontractor	Hofmeijer Civiel- en Cultuurtechniek
Client's representative	Royal HaskoningDHV (RHDHV)
Project objective	Create an area for water storage to compensate for the increase of paved area (highway A9) and sustain the spatial and the ecological qualities as much as possible.
Scope	- Extra water surface - Natural banks
Contract sum	€1 million
Contract period	03/2014 - 03/2015
Other essential information	For this project, the Employer has signed a contract with the Contractor and the quality management is based on the Contractor's Quality Management System. Both the Employer and the Contractor are free to choose people for their Project Team. The Contractor selected a specialist Subcontractor to join the Project Team and to carry out the works. The Subcontractor entered into a contract with the Contractor, but not with the Employer. This subcontractor agreement is not a UAC-IC 2005 contract, but it is not clear what kind of contract they did apply. No matter what kind of contract it is, the Subcontractor acts on behalf of the Contractor and has to comply with the quality management requirements. Further, all project risks were transferred to the Subcontractor. As this project is quite small, the Project Team mainly consists of the Subcontractor's team. The Contractor's project manager is not involved on a day-to-day basis, but only joins the progress meetings and so on.

Project organization



The table above gives an overview of the project data. The project was assessed by means of the assessment models of Chapter 5. The whole assessment can be found in Appendix 25. The next two subsections deal with

the trust level and the change management level on the project, respectively. The influence of trust on the change management process is dealt with thereafter.

Discussion of trust on project Bijlmerweide

Table 54: Assessment model for trust on project Bijlmerweide

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	2.5
			(2) Seek party with similar culture/policy	3	2.5
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2.5
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	3
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	2.5
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	2
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	1
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	3
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	3
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	3.5
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	1
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	2.41

Overall, the level of trust between the Employer and the Contractor is 2.41 out of 4 (see table above), which implies a confident to high trust level. The most decisive aspects which have created that trust level between the parties are elaborated in this section by means of findings in the project records and the interviews, whereas the other aspects can be found in Appendix 25. These are all trust building aspects: the direct agreement procedure (1+2), the MEAT award criterion (1), the Contractor's goodwill, passion and motivation (8), mutual reasonable and fair behaviour (8), focus on the target (3), a lot of informal communication (9), adherence to the Quality Management System (QMS) (3) and WIN for all parties (3).

The UAC-IC 2005 has little influence (25%) on the trust level between the parties. Only two of the important aspects partly stem from the UAC-IC 2005: the focus on the target is created by means of the strict deadlines and the QMS requirements. Most of the less relevant aspects (see Appendix 25) do not emanate from the UAC-IC 2005 either. Further, the parties do not act in good faith because it is written in the DCC, but acting in good faith is rather a norm for the people involved on this project. In contrast, the Procurement Act 2012 (the UAC-IC 2005 is directly linked to this Act) and the involvement of the Subcontractor do have a lot of influence on the trust level. According to the Procurement Act 2012, the Employer was allowed to apply the 'direct agreement procurement procedure' so that they could choose the tenderers of their own choice and the Employer was obliged to apply the MEAT criterion which requires the tenderers to offer the highest price-quality ratio rather than just the lowest price. During the procurement, the Employer also laid down technical competences on the Contractor's personnel, which probably instigated some tenderers to hire specialist subcontractors to do the job. On this project, the winning tenderer (KWS) indeed hired a specialist subcontractor. The involvement of this Subcontractor has a lot of influence on the trust level between the parties, because the Subcontractor's team is very competent, passionate and motivated to do the job, and shows goodwill and acts reasonable and fair towards the Employer. All these aspects are discussed in detail below.

Most decisive for building trust on this project

Procurement

	score
(1+2) Direct agreement procedure, National tender. The Employer was allowed to select the contractors of his own choice	3
(1) MEAT award criterion: only based on price and quality	2
(1) Requirements on the personal level were merely based on the technical competences	2
(1) The tender team is the same as the project implementation team	3
(1) No significant amendments to the UAC-IC 2005	3

According to the Selection and Tender Guideline (Gemeente Amsterdam Stadsdeel Zuidoost, 2014c, p. 2), the contract was put out to National tender and the Employer chose the direct agreement procedure conforming the Public Works Procurement Regulations 2012 (ARW 2012), which implies that he has to select 3 to 5 contractors of his own choice for the procurement. This procedure was allowed because the contract value did not exceed the €1,500,000. The selection process of the contractors was held internally in the Employer's organization. The factors which determined the selection were good past co-operation, experience in ecological works and little time for the selection. So the contractors' trustworthiness (i.e. ability, benevolence, integrity, predictability and reliability) to carry out the project was checked first during the selection process.

Pursuant to the Selection and Tender Guideline (Gemeente Amsterdam Stadsdeel Zuidoost, 2014c, pp. 7-14, annex 16), the Most Economically Advantageous Tender (MEAT) was determined on the basis of qualitative and financial award criteria. The qualitative part consisted of the contractor's proposal which was assessed in terms of the programme, working in a fragile ecological area, the works during the maintenance period, and the elaboration of the soil retaining water bank protection and kingfisher wall. The financial part encompassed the tender prices for the design, the construction, the as-built files, and the maintenance. On the one hand, according to the Employer's team the grounds for refusal and the contractors' proposals were sufficient to determine the contractors' trustworthiness to carry out the project. The quality of the proposals clearly showed the differences in technical competences between the contractors regarding land development and ecological works and whether they hired or consulted specialists. The MEAT discount formula was essential to ensure a good price-quality ratio and to force the contractors to deliver a high quality besides a low price. On the other hand, according to the Contractor's team, the contractors could show by means of their proposal how trustworthy they were to carry out the project. The Employer allowed a lot of room for the contractors to come up with their own ideas (e.g. regarding stakeholder management) in order to distinguish themselves.

Pursuant to the Employer's Requirements (Gemeente Amsterdam Stadsdeel Zuidoost, 2014b, pp. 55-56), the Employer also had requirements on the personal level with respect to the Contractor's team since certain team members had to be certified for 'Flora en faunawet bestendig beheer'. None of the tenderers was a specialist in ecological works, so it was likely that the winning contractor would subcontract the works to a specialist, which actually happened on this project. The Contractor's tender team is the same as the project implementation team, which was probably because the Contractor hired a relatively small Subcontractor.

Overall, the contract between the Employer and the Contractor does not contain significant amendments to the UAC-IC 2005.

People

	score
(8) The Contractor's goodwill, passion and motivation to deliver a good project	3
(8) Reasonable and fair behaviour of both parties	3

The principle of good faith is important on the project and has quite some influence on the behaviours of the Employer and the Contractor during the project. However, the people involved in the project do not act in that manner because it is written down in the Dutch Civil Code, it rather seems to be a general principle of them. Good faith allows for flexibility in the parties' attitude and behaviour to resolve problems (mainly regarding variations and safety) quickly and deliver the project in time, which is important because of the short programme and the location. For example, #3P mentions that often it is necessary to deviate from the formal procedures to implement variations prior to the paperwork. In such cases, the Employer gives his approval for the variation, the Contractor implements it and thereafter both parties have to trust each other that the correct paperwork will follow (e.g. the Employer will pay for the variation and the Contractor will not claim higher costs than agreed upon). There is a lot of mutual trust and openness between the parties, which is created by people involved. The Contractor's team is very passionate about their work as it is a prestigious project for them and is not only interested in making a profit but is also very motivated to deliver a good project, which increases the Employer's trust in the Contractor.

Process

	score
(3) Focus on the target in terms of the programme mainly due to strict deadlines and fines.	3
(9) A lot of informal communication by means of phone, email, visits etc.	3
(5) Only informal EWs with no sanctions	2
(5+9) Informal discussion and agreement prior to sending the formal documents	3
(10) Timely joint problem-solving at the lowest levels	3.5

The Basic Contract (Art. 16 and annex 2) states that the project has two deadlines and if the Contractor does not meet them, he will get a fine. Focus on the target is partly created by these deadlines as they are quite strict, because Rijkswaterstaat's highway A9 megaproject cannot start before this project is completed.

There is a lot of informal communication between the Employer and the Contractor by phone, mail, informal meetings and on site. Informal communication is important to deal with matters quickly, which is necessary because of the short duration of the project and the many residents (stakeholders) involved in the project. The parties agreed to discuss and resolve problems informally prior to confirming things in VISI (=DMS). If there are problems, the parties warn each other timely by phone, email, pictures or during meetings, and meet as soon as possible thereafter. During the meeting, the parties discuss the problem and are open to each other's arguments, and collaborate and help each other if needed. Problems which require many changes to resolve them will be escalated to management. So far, all problems have been resolved by amicable agreement. Only a few risks (e.g. the risk of seep) were escalated up to the highest level. The escalation model consists of the people on the work floor> the Project Manager> Rijkswaterstaat. The lines between the first two levels are informal since the Project Manager is quite up to date about any problems.

Product

	Score
(3) The Contractor adheres to the quality management system	3
(3+8) The Contractor is delivering a good product	3
(3+x) WIN for all parties and understand each other's interests	3
(3+8) Informal incentive for the Subcontractor (prestigious project), so not merely wants to make profit	3

During the PSU, the Contractor reassured the Employer regarding the use of the quality management system, which increased the Employer's trust in the Contractor. So far, the Contractor has met the requirements regarding this system and is delivering a good product. The parties seem to have created a win-win-win situation for themselves. The Employer gets the high quality product, the Contractor receives his cut for managing the project, and the Subcontractor can work on a prestigious project and will of course also receive his cut for executing the works.

Discussion of change management on project Bijlmerweide

Overall, the level of change management is 2.19 out of 4 (see table below), which implies systematic change management. The most important aspects which have created that change management level are elaborated in this section by means of findings in the project records and the interviews, whereas the other aspects can be found in Appendix 25. The most important efficiency and effectiveness creating aspects are: clear and efficient change management procedure (2), largely proactive change management approach (7), informal discussions (7), early informal notifications (7), and trust between the parties as most variations are submitted afterwards in order to create more efficiency (x). The most important inefficiency and ineffectiveness creating aspect is that risk management is not closely related to change management (4). On this project, the main focus is on the 'gaps in the contract'.

The UAC-IC 2005 has very little influence (0%) on the change management level on this project, because the parties do not apply the change management clauses in the UAC-IC 2005. This aspect is discussed in detail below.

Table 55: Assessment model for change management on project Bijlmerweide

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	2
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	3
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	2
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	2
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	1.5
			(6) Update shared databases and incorporate lessons learned for project and organization	4	1
	Recognize change	Change management process	(7) Early identification of potential changes	4	3
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	1.5
	Evaluate change		(9) Document the proposed change in a log	3	3
			(10) Determine priority of the change	3	2
			(11) Selection of optimum change options by consulting all relevant parties	3	2.5
			(12) Identify the likely impacts of different change options	3	2.5
	Resolve change		(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	2.5
			(14) Communicate final change decision to all team members whose work is affected by it	3	3
			(15) Appropriate documentation to record all decisions within the change process	3	2
	Monitor implementation		(16) Monitor and record implementation	3	1.5
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	2.19

Most important for creating an efficient and effective change management process

Efficient and effective

	score
(2) Clear and efficient change management procedure	3
(7) Overall change management approach is largely proactive	3
(7) Discuss variations informally prior to the formal procedure	3
(7) Early informal notification of variation by means of phone call or email	3
(7-16) Overall the change management procedure is not followed as consistent as should be in order to increase efficiency	2
(x) Trust between the parties	3

According to the interviewees, the change management procedure in the UAC-IC 2005 is too circuitous and onerous for the size and the short duration of the project. Most variations are relatively small on this project (variations are big if they exceed €10,000) and must be discussed quickly, otherwise the Contractor cannot continue the works. Therefore, it is important to know the impact of the variation immediately in order to make the decision to accept or reject the variation. So, the parties decided not apply any of the variation clauses in the UAC-IC 2005, but came up with a more efficient procedure. The unsuitable change management procedure in the UAC-IC 2005 in such cases is in line with what (Bleeker, 2014b, p. 710) states. The clauses were not omitted though, because the Employer did not see any risk (e.g. legal dispute with the Contractor) in not omitting them and the change management procedure could always be used as a backup. The change management procedure used on the project is as follows (KWS & Hofmeijer, 2014, p. 12): Both the Employer and the Contractor have to submit the change order to the Contractor's project leader, this form includes a description, the reason, the consequences and the required actions of the variation. The project leader records the variation request in the change register. The Employer accepts or rejects the change order and the decision will be recorded in the register. According to the interviewees, this change management procedure has changed a bit during the project to make it even more efficient. In first instance, the Contractor had to enter all potential variations into VISI so that the Employer could reply to it, but this process was too complex, circuitous and static. Later, any potential variation will be discussed and agreed informally between the parties by email or phone prior to drawing up the change order and entering it into VISI.

The change management approach by the Employer and the Contractor during the project is largely proactive as the Contractor notifies variations informally as soon as possible by phone or email or during progress meetings. The change management procedure is not followed as consistent as should be in order to increase efficiency. About 80% of the variations are quite small and are often implemented prior to the paper work. Such variations will be notified first. After acceptance by the Employer, the works will continue and the change order will be drawn up thereafter. This way of working requires good faith and trust between the parties.

Inefficient and ineffective

	score
(4) Risk management is not closely related to change management	2

Risk management is not closely related to change management on this project. The change management may become more efficient if these two things were closely related.

Influence trust on change management process on project Bijlmerweide

On this project, trust is needed to apply the change management procedure correctly or to accept any deviations from it in order to increase the efficiency of the change management process. Most variations are quite small and are submitted afterwards so that the works can continue. Further, the open informal communication structure between the parties and the parties' focus on the target encourage the parties to notify any variations early on. The Contractor shows goodwill and there is a good mutual understanding between the parties, which makes the decision-making about variations more flexible and quicker as it often concerns grey areas in the contract.

The following table shows the answers given by the interviewees to the question: *irrespective of the project, how much influence does trust between the Employer and the Contractor have on the efficiency and the effectiveness of the change management process?* A five-point scale was applied: 0% = very little influence, 25% = little influence, 50% = neither little nor much influence, 75% much influence, and 100% = very much influence. Even though the question was irrespective of the project, many answers given seem to be applicable to the project as well as they correspond quite well with the links between trust and change management found in the assessment data.

Table 56: The influence of trust on the change management process according to the interviewees of Bijlmerweide

According to the given answers (If there is trust...)
Average score by the interviewees: 75% of the efficiency is influenced by trust
2/4 interviewees (#3P, #4C) Efficiency: less time needed to check the variation and its impact.
1/4 interviewees (#2E) Efficiency: there is focus on the target, so the Contractor may submit change orders afterwards (no need to stop working, thus beneficial to the schedule)
Average score by the interviewees: 25% of the effectiveness is influenced by trust
1/4 interviewees (#4C) Effectiveness: submit right change option and right impact
2/4 interviewees (#2E and #3P) Effectiveness: 0% influenced, parties are obliged to follow the variations procedure.

7.3 UAC-IC 2005: Project Drachtsterweg

Table 57: General data project Drachtsterweg (Heijmans Integrale Projecten, 2013, 2014; Provincie Fryslân, 2012a, 2012d, 2012e, 2013)

Project name	Verdiepte ligging Drachtsterweg inclusief aquaduct te Leeuwarden
Location	Leeuwarden, The Netherlands
Contract	UAC-IC 2005
Law	Dutch Law
Project delivery system	Design & Build (D&B)
Employer	Provincie Fryslân
Contractor	Heijmans Integrale Projecten
Client's representative	Royal HaskoningDHV
Project objective	Reconstruct the Drachtsterweg (largely to a recessed level) and create an aqueduct to cross the Van Harinxmakanaal in order to optimize the accessibility of Leeuwarden.
Scope	- Reconstruction of the Drachtsterweg (from Drachtsterplein to longboats route Wiarda), largely to a recessed level - Aqueduct under the Van Harinxmakanaal - Demolition of the existing bridge - Longboats route Wiarda - Bicycle roads and bridge - Lighting and installations - Landscaping
Contract sum	€33 million
Contract period	02/2013 - 04/2016
Project organization	The organizational chart illustrates the project organization structure. It is divided into three main sections: Municipality Leeuwarden, Province Fryslân, and Heijmans. Municipality Leeuwarden includes a Liason Manager / Account Manager. Province Fryslân includes a Programme Manager, Assistant Project Manager, Technical Project Manager / Contract Manager, and Assistant Technical Project Manager. Heijmans includes a Director, Project Manager, Liason Manager, Design Manager, Process Manager, and Construction Manager. Royal HaskoningDHV (RHDHV) includes a Process Coordinator, Risk Manager, Front Office, and Back Office. Contractual relationships are indicated by solid lines, and primary communication lines are indicated by dashed lines. A legend at the bottom right explains these symbols.

The table above gives an overview of the project data. The project was assessed by means of the assessment models of Chapter 5. The whole assessment can be found in Appendix 28. The next two subsections deal with the trust level and the change management level on the project, respectively. The influence of trust on the change management process is dealt with thereafter.

Discussion of trust on project Drachtsterweg

Table 58: Assessment model for trust on project Drachtsterweg

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	1.5
			(2) Seek party with similar culture/policy	3	1.5
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	3
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	2.5
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	1.5
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	2
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	2
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	2
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	2
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	2
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	2

Overall, the level of trust between the Employer and the Contractor is 2 out of 4 (see table above), which implies a confident trust level. The most decisive aspects which have created that trust level between the parties are elaborated in this section by means of findings in the project records and the interviews, whereas the other aspects can be found in Appendix 28. These are all distrust building aspects: the lowest price tender (1), the 'like it or lump it' contract (6), the Employer's traditional way of acting (8), no mutual reasonable and fair behaviour (8), and the contradictory project objectives (3).

The UAC-IC 2005 has very little to little influence (0-25%) on the trust level between the parties. Only one of the important aspects directly stems from the UAC-IC 2005: the fitness for purpose requirement. Most of the less relevant aspects (see Appendix 28) do not emanate from the UAC-IC 2005 either. At the lowest levels, the parties do not act in good faith because it is written in the DCC, but acting in good faith is rather a norm for these people, whereas at the highest escalation level, the parties do act in good faith because of the DCC. In contrast, the amendments to the UAC-IC 2005 do have a lot of influence on the trust level. The Employer amended quite some clauses, for example, the risk of the geotechnical conditions was shifted more towards the Contractor. Further, the contract award criteria and the Employer's traditional way of acting have quite some influence on the trust level between the parties. The Employer did not apply the MEAT award criterion correctly, so it became a lowest price tender. During the project implementation, the Employer's team is quite involved in the processes, which is not in accordance with the D&B project delivery system. All these aspects are discussed in detail below.

Most decisive for building distrust

Procurement

	score
(1) MEAT award criterion was not applied correctly and did not include the technical proposals, as a result it became a lowest price procurement.	1

According to the Selection Guideline (Provincie Fryslân, 2012c, pp. 6-12), the contract was put out to European tender and the restricted procurement procedure conforming the Public Works Procurement Regulations 2005 (ARW 2005) was applied, which consisted of two stages: selection and award. There was a long list of 8 contractors in the first stage and all contractors were allowed to the second stage, but 2 contractors withdrew because they did not think they would win the contract and did not want to make high tender costs with such low odds. According to the Tender Guideline (Provincie Fryslân, 2012b, pp. 10-14), the Employer applied the

MEAT criterion in the final tender stage. The award criteria for the tenders were the CO2-awareness certificate level and the tender price. The tenderers simply had to choose which level (0-5) they wanted to achieve. Only the three highest levels were associated with a discount on the tender price. The contractors' calculation designs including construction approaches were not part of the award criteria. All contractors went for the highest CO2 level, which meant that the discount on the tender price was the same for everyone. As a result, it became a 'lowest price' procurement.

Contract

	score
(1+5+6) 'Like it or lump it' contract which contains many amendments.	1
(6) <i>Risks are allocated to the party best able to manage them, except for the geotechnical conditions</i>	2.5
*(8+11)+CM(7) Disagreement about the interpretation of the D&C contract (i.e. the Employer's role and the design freedom)	1

The Contractor was not involved in drawing up the contract and did not have any remarks on the amendments. According to #10C, in general, it is better for the Contractor not to ask questions during procurement, because he often has to deal with 'like it or lump it' contracts. If the Contractor asks a question, he might lower his chances of winning the contract and mostly, employers do not amend a contract for one single contractor. One of the amendments is the added project-specific risk allocation to the Basic Contract in Annex 12, because the Employer wanted to align the risk allocation with the construction method for building underground. The added risk allocation has shifted more risks regarding the geotechnical conditions towards the Contractor. On this project, the risk of geotechnical conditions is mainly allocated to the Contractor. The Employer has done everything he could do to obtain information about the geotechnical conditions, and has provided it to the Contractor during procurement. The Employer remains liable for any errors in the geotechnical information, but the Contractor is fully liable for all other geotechnical risks, because the Contractor has to interpret that information and to determine his construction method himself. The Contractor's team argues that it is not clear as to whether the risk allocation is legal, because it is not in accordance with the principle of reasonableness and fairness, and not in accordance with the UAC-IC 2005 in which the geotechnical risks remain shared between the parties if the Contractor can prove that he has done everything to adjust his works to the geotechnical information provided.

Ten months after the PSU, there was a PFU in which the interpretation of the D&C contract was the main point of discussion according to the interviewees and the Project Follow Up Report of 14-01-2014. The Employer's perception of a D&C project is different than the Contractor's. The Contractor argued that it is not a D&C, but rather an E&C project because the Employer already has a solution in place for many aspects. The Employer argued that it is a D&C, because the Employer has defined the design components in the contract and the Contractor is free to determine the complete structural design, he only has to take into account some conditions (e.g. the visual design is fixed). Both parties stuck with their point of view and accepted that the problem could not be resolved (i.e. agree to disagree). This subject recurs in many discussions, but it cannot be resolved. A risk analysis showed that the Contractor does not trust the Employer, partly because of how the Employer's team is set up. The Employer has a supervisor on site, and the Employer's team is quite involved in the project by means of the meetings and the checks of Contractor's documents during the acknowledgement process. Further, there is also a discussion about the Employer's warning obligation. The Employer is of opinion that they also have a warning obligation towards the Contractor and that reciprocity of the Contractor's warning obligation can be derived from the UAC-IC 2005. The Contractor does not think the Employer has such obligation pursuant to the UAC-IC 2005.

People

	score
(8) 'Us versus them' behaviour and no mutual reasonable and fair behaviour at the lowest level	2
(5+8) The Employer is quite reluctant to accept claims related to the Employer's Requirements	1
(8) Good faith in the DCC only has influence at the highest escalation level	2.5

The principle of good faith in the DCC does have influence on the behaviours at the highest escalation level, but not at the lowest level. At the lowest level, the parties do not take into account good faith in first instance, but it only becomes important after intense discussions and when the parties have tightened their positions.

According to #1E, matters often escalate to ‘us versus them’ behaviour (in Dutch: hullie en zullie gedrag). The parties act out of emotions and circumstances, rather than taking into account the DCC. The content of good faith depends on the parties’ interests and the facts and eventually the principle of good faith is used to resolve the stalemate and the problem, but sometimes the parties should act more reasonable and fair on the project, because both parties tend to stick to their positions too long before they give in. #3E and #6P, who are working at the lowest level state that the Contractor is less reasonable and fair than the Employer is, because the Contractor tries to take advantage of the Employer’s reasonableness and fairness, and that the Employer is a bit reticent towards the Contractor as the Contractor seems to have merely one project objective, which is ‘to make profit’.

According to #1E, the Contract Manager was instructed by the Employer to say ‘no’ to claims related to the ER from the Contractor, because the Employer is of opinion that the contract is good. Such situations lead to disagreements, which have to be escalated to the highest level. At the highest level where the mandates are, the parties look at the big picture and gather the matters, check whether they are caused by ‘black and white’ or ‘grey’ areas in the contract and subsequently make agreements about it. The principle of good faith is of influence here and becomes more important when more money is involved, partly because of the DCC, partly because the parties have to resolve the matters and partly because the parties have to take into account potential law suits.

Process

	score
(3+8) The collaboration agreements (openness, focus on the target, timeliness etc.) are quite standard and are not fully effective due to contradictory interests	2.5
(5+8+x) The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides.	2
(5+6) Disagreement about the responsibility of the unexpected geotechnical conditions	1
*(5) The Contractor fails to give EWs, whereas the Employer gives many EWs, but these are unwanted	2

The Project Start Up meeting was led by a third party (Motion Consult) and encompassed a team building workshop in which the parties got to know each other, the team objectives were stated and each other’s interests were discussed. The workshop concluded with a list of collaboration agreements (Project Start Up report). According to the interviewees, the Employer and the Contractor have only partly complied with the collaboration agreements up to now. Openness, focus and timeliness are more difficult to comply with when there are problems on the project which involve a lot of money, because then the parties mainly try to protect their interests. ‘Openness’ varies during the project. If there are problems (which is the case at the moment due to the 5-month delay), the tension between the parties increases and the openness decreases during formal meetings because both parties want to protect their own interests. For example, in case of a potential claim, the Employer will not openly tell the Contractor how he feels about it, otherwise he will not have an argument anymore against the Contractor’s claim. Interviewees #3E, #5P and #6P state that the Contractor often is not open about any problems and does not notify the Employer of problems timely, which leads to back-against-the-wall situations for the Employer in which he can only agree to the Contractor’s proposal or escalate the problem. The parties’ contradictory project objectives impairs the focus on the target. The target ‘to construct a high quality product within time and budget’ is an onerous thing to achieve, since the focus of the parties is contradictory as well. The Employer is mainly focused on the quality, whereas the Contractor is mainly focused on the finances. The Contractor argues that Employer lacks focus because the Employer sometimes refers to the contract too much regarding the construction method of the aqueduct. The Employer’s counterargument is that they use the contract (including the UAC-IC 2005) as a guideline on the project, because it was drawn up with care in order to safeguard the compliance with the agreements made with the neighbourhoods and the stakeholders. Hence, the Employer often checks whether the Contractor meets the requirements in the contract.

According to #1E and #7C, the escalation model does not work optimally, because the parties did not define and agree on the roles and responsibilities in the escalation model. For example, the mandate regulations in the Employer’s and the Contractor’s model are different. Generally, the discussions about matters are long because they start at the lowest levels, but most matters are immediately escalated to the highest level, because most

matters are about money and the mid-level has limited mandate. #1E states that both Employer's and Contractor's team very often make the mistake of arguing about things they are not responsible for, rather than just identifying the problem and escalating it.

The absolute risk allocation discussed under subsection 'contract' may lead to disagreements about the liability of the risks, which is what happened on the project when the Contractor encountered different geotechnical conditions than expected. A part of the aqueduct can only be built during the winter because of the sailing season, but another activity on the critical path took longer than expected. That critical activity was the excavation of the cofferdam and the construction of the tension piles for the aqueduct, which took longer than was planned because the soil conditions were harder than expected. The Contractor argues that the Employer's geotechnical information did not show such density. The 'sailing season' deadline was not met and now the Contractor suffers a 5-month delay. The parties try to resolve this problem together, because the delay has high cost consequences for both parties. The claim has not been submitted yet by the Contractor, but it would be a claim worth over €1,000,000.

As a result of the disagreement about the Employer's warning obligation discussed in sub section 'contract', early warnings are mainly given by the Employer, but the Contractor does not want such early warnings. The Contractor argues that he is leading the project and knows what to do, and that the Employer is too involved considering the D&B contract. The Employer thinks he has an obligation to warn and thinks it is desirable behaviour. Therefore, when the Employer gives an early warning, the Contractor does not do anything with it or tries to make it appear less important than it really is. The Contractor often does not listen to the Employer because of the Contractor's financial drive and the Employer's traditional attitude. Another example is when there is a deviation, the Contractor generally wants a cheap solution, whereas the Employer wants a more luxurious solution.

Product

	score
(3+6)+CM(1) Win-partial win situation due to lowest price tender	2
(3+5+8) No other mutual objectives besides fitness for purpose, therefore the objectives remained contradictory	2
*(3+5+8) The Employer wants a higher quality product than the Contractor is delivering, therefore the Employer often refers to the contract.	2

Several interviewees (#1E, #4P, #7C, #8C and #9C) mention that the Contractor had to offer quite a low price in order to win the contract due to the lowest price tender. The parties' project objectives regarding the results were discussed in the PSU meeting, but were not aligned. The Employer stated his objectives in his Contract Management Plan (Provincie Fryslân, 2013, pp. 2-3), whereas the Contractor's objectives were stated in his Project Management Plan (Heijmans Integrale Projecten, 2013, pp. 6-7). Both documents were exchanged, so the parties are aware of each other's interests. #1E, #4P and #9C argue that it was difficult to align the objectives since they are quite divergent and contradictory. The project requirements are stated in the contract and the common goal is to deliver a good project within time. However, a 'good' project has different meanings for the parties. According to the Employer, the project is 'good' if the works are constructed against minimum costs and are of high quality, and if there is minimum disturbance for the surrounding neighbourhoods. A 'good' project for the Contractor is a project that yields maximum profit with minimum effort, for example, by building as cheap as possible and maximizing the scope. These contradictory project objectives recur in many discussions and also instigate the parties to behave like 'us versus them' at the lowest level.

The Employer often checks whether the Contractor meets the requirements in the contract and refers to it in order to safeguard the compliance with the agreements made with the neighbourhoods and the stakeholders, which implies that the Employer is not fully satisfied with the quality the Contractor is delivering.

Discussion of change management on project Drachtsterweg

Table 59: Assessment model for change management on project Drachtsterweg

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	2.5
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	3
			(3) Agree on project philosophy with regard to risk allocation	3	1.5
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	2.5
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	1.5
			(6) Update shared databases and incorporate lessons learned for project and organization	4	1
	Recognize change	Change management process	(7) Early identification of potential changes	4	2
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	2
			(9) Document the proposed change in a log	3	3
	Evaluate change		(10) Determine priority of the change	3	2
			(11) Selection of optimum change options by consulting all relevant parties	3	2.5
			(12) Identify the likely impacts of different change options	3	2.5
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	2
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	3
			(15) Appropriate documentation to record all decisions within the change process	3	2
	Monitor implementation		(16) Monitor and record implementation	3	3
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	2.25

Overall, the level of change management is 2.25 out of 4 (see table above), which implies systematic change management. The most important aspects which have created that change management level are elaborated in this section by means of findings in the project records and the interviews, whereas the other aspects can be found in Appendix 28. The most important efficiency and effectiveness creating aspects are: clear and efficient change management procedure (2), informal discussions (7) and the separate regular variations meetings (7). The most important inefficiency and ineffectiveness creating aspects are: the disagreements about the price (7-16), the escalations (7-16), the half/reactive to largely proactive change management approach (7), the ineffective warning obligations (7) and risk management is not closely related to change management (4). On this project, the main focus is on the 'gaps in the contract'.

The UAC-IC 2005 has neither little nor much influence (50%) on the change management level on this project, because the change management procedure used is based on the change management clauses in the UAC-IC 2005. However, the procedure used is simplified and less formal than in the UAC-IC 2005. Further, the warning obligations are not fully effective. All these aspects are discussed in detail below.

Most important for creating an efficient and effective change management process

Efficient and effective

	score
(2) Clear and efficient change management procedure	3
(2+7+x) Discuss variations informally or during the separate regular variations meeting prior to the formal procedure and send a draft change order by email first	3
(2+7+x) Separate regular variations meetings	3

The variations procedure stated in the Employer's Contract Management Plan (Provincie Fryslân, 2013, pp. 27-28, annex 21) and the Contractor's Project Management Plan (Heijmans Integrale Projecten, 2013, pp. 17-21) is based on the procedure in the UAC-IC 2005. However, there are some amendments and deviations. Compared to the UAC-IC 2005, the variations procedure used is simplified and less formal. First, §14.13 - §14.15 were omitted, because the DAB was not authorized to settle disputes. Second, §14.16 (i.e. the variation will be withdrawn if there is no agreement on the impact) was deleted to force the parties to make agreements and

because all variations initiated by the Employer are necessary ones. Third, §14.17 (i.e. compensation for the Contractor in case of delays in the procedure) was omitted to remove an incentive for the Contractor to delay the processes and because sometimes it takes a long time for the parties to settle the variations due to busy schedules of the people involved. Fourth, due to efficiency, the Employer demands an estimate of the impact beforehand for every potential variation in order to determine whether he wants to proceed with the variation or not. If the price is too high and the parties cannot agree on it after discussions, then the Employer can talk to the stakeholders or look for another contractor to implement the variation (which may be difficult though because the work is on the Contractor's work area). Fifth, the check whether the Contractor is obliged to carry out the variation does not take place, because the Employer assumes that the Contractor will carry out any variation within his work and work area. Some interviewees mention that leaving out this step does not really lead to any problems, because mostly, the Contractor is willing to execute the variation, and if the variation does not involve the Contractor's works or work area, then the Employer can just get another contractor to do the job. Sixth, the deemed acceptance is still applicable, but both parties do not use it because the communication about variations is not that formal as in the UAC-IC 2005, because the parties agreed always to reply to communication (so far, this works), and because the parties try to remain in discussion and to keep making progress. Seventh, variations to the Basic Contract and to the ER are dealt with through the variations procedure, but the parties agreed to record variations to acknowledged documents as deviations, because the Employer really has requested a lot of documents for the acknowledging process.

Potential variations will be discussed informally or during the separate regular variations meeting prior to the formal procedure. To increase efficiency, the parties agreed to send a draft version of the change order by email.

Inefficient and ineffective

	score
(7-16+x) The change management process is not very efficient due to disagreements about the price at the lowest level and the escalations or because the Contractor did not put the variation yet.	2
(7) Overall change management approach is half reactive/half proactive to largely proactive	2.5
(7) The standard warning obligation and the extra warning obligation are not fully effective	1.5
(4) Risk management is not closely related to change management	2

#2E, #3E and #5P argue that the change management process is not very efficient due to the discussions about variations and the escalations, it usually takes long to come to an agreement between the parties. Sometimes, the processing of variations may take months, partly because the Contractor did not put a price on it yet. 9C states that the efficiency of the variations procedure and the speed of decision-making depend on the priority and the total impact of the change, how the parties communicate about it, the timing of notifying the price, the mandate regulations, the completeness of information, the work load, whether the variation is realistic, how long the discussions are, and whether there is an agreement on the technical and financial part.

The change management approach by the Employer during the project is half reactive/half proactive to largely proactive. The Employer does not initiate many variations, but the Municipality sometimes has some variations requests. The Employer does not want scope changes, especially unexpected ones, since they usually have time and cost consequences. The Employer does identify variations and deal with them quickly. However, the approach is sometimes quite reactive, because of the Employer's strategy. For some aspects, it is better not to notify things early to the Contractor. For example, the Employer is quite slow with dealing with variations initiated by the Contractor which concern parts that the Contractor already started to construct. Further, the Employer's team checks many Contractor's documents, therefore they are better able to foresee any variations.

The change management approach by the Contractor during the project is half reactive/half proactive to largely proactive. The Employer's team thinks that the Contractor is quite reactive, whereas the Contractor's team think they are quite proactive. On the one hand, the Contractor does identify variations and deal with them quickly. The Contractor is quite proactive with assessments to check whether something is a scope change or not, otherwise the Contractor would lose money over it. As the Contractor wants to process the variations quickly, they give less substantiation of the time and cost impact, while the Employer wants to know more details. On

the other hand, the Employer's team thinks that the Contractor is too slow and too negligent with submitting variations, it seems like the Contractor does not want any variations. This reactive approach may be because of the Contractor's strategy as for some aspects, it is better not to notify things early to the Employer. Further, the Employer's team is not happy about the fact that some variations are already implemented by the Contractor before the variation order is even submitted.

§4.7 in the UAC-IC 2005 lays down an obligation for the Contractor to warn for apparent errors in the Employer's documents. On this project, the Employer has added an extra control and warning obligation for the Contractor in the Basic Contract (annex 14), which is more stringent than the existing one, because the Contractor has to warn for all errors and not just the obvious ones. The Employer made the amendment with the extra control and warning obligation, since it is important to the Employer that the information provided (e.g. the geotechnical information) is correct because he is liable for that information and because during procurement, the tenderers determine their construction method on the basis of that information. The Employer wanted to instigate the Contractor to take on a more proactive attitude in his research of the documents, so that he can check the correctness of the information provided and warn the Employer about any errors and ambiguities early on. The Contractor had received the Employer's documents during the tender process, where he could ask questions and he also had a warning obligation for ambiguities and the questions asked. After the contract award, the Contractor had the opportunity to check the documents again and to warn if needed. During the project, the Contractor gains more and more insight into the documents. The Employer expects the Contractor to be on top of it, but the parties did not make any agreements about the content of that extra control and warning obligation. Further, the Employer can always fall back on this amendment if they can prove that the Contractor knew about the errors in the document, but this situation does not occur very often. The Employer can use the fact that the Contractor did not give a warning as an argument during negotiation, but the argument is not strong enough to take away the Contractor's entitlement to compensation for the variation. The argument can be used to define the 'grey area' during negotiations.

The Employer's team states that the Contractor does not adhere to those extra obligations sufficiently, but it is difficult to prove that the Contractor should have discovered an error since the Employer cannot ask the Contractor to see something he did not see. Therefore, the liability of the error does not shift towards the Contractor, because he can always state that he did not see it. They further argue that such clauses are for show, because if the Contractor discovers an error in the Employer's documents and they think they are the only one who has seen it, then they could make quite use of it rather than giving a warning about it. The Contractor's team confirm that they do check the documents, but do not conduct extra checks, but this has not led to any problems up to now and the Employer has not referred to this annex yet. They also argue that the warning obligation of clause 4.7 is not clear regarding contradictories in the ER as a result of different interpretations of the requirements in the ER. The Contractor cannot warn for such contradictories, because they are not aware of them. There are really a lot of things in the contract which are open to interpretation.

Risk management is not closely related to change management on this project. The standard warning obligation and the extra warning obligation do not explicitly play a role in the change management procedure. These warning obligations are not used to identify potential variations early, but it is used for identifying risks. However, risk mitigation measures may consist of variations.

Influence trust on change management process on project Drachtsterweg

On this project, trust is needed to apply the change management procedure correctly in order to increase the efficiency of the change management process. Some other change management aspects were directly influenced by distrust. First, in some cases both parties mainly want to protect their own interests due to the contradictory project objectives, which results in late notifications of potential variations. Second, if there is distrust, there is more communication by email instead of informal visits in order to confirm things. Third, the change management process is not very efficient due to disagreements about the price at the lowest level or because the Contractor did not put the variation yet. Fourth, the Contractor offered to carry out the works at a low price,

which is probably why they sometimes submit questionable variations to generate profit. Fifth, the Employer's reluctance to accept claims related to the Employer's Requirements, the 'us versus them' behaviour at the lowest level and the escalations lead to an inefficient change management process and a packaged deal (e.g. split 50/50) at the highest level. Sixth, if there is distrust, then the collaboration and help to resolve mutual problems and Contractor's problems is not always effective.

The following table shows the answers given by the interviewees to the question: *irrespective of the project, how much influence does trust between the Employer and the Contractor have on the efficiency and the effectiveness of the change management process?* A five-point scale was applied: 0% = very little influence, 25% = little influence, 50% = neither little nor much influence, 75% much influence, and 100% = very much influence. Even though the question was irrespective of the project, many answers given seem to be applicable to the project as well as they correspond quite well with the links between trust and change management found in the assessment data.

Table 60: The influence trust on the change management process according to the interviewees of Drachtsterweg

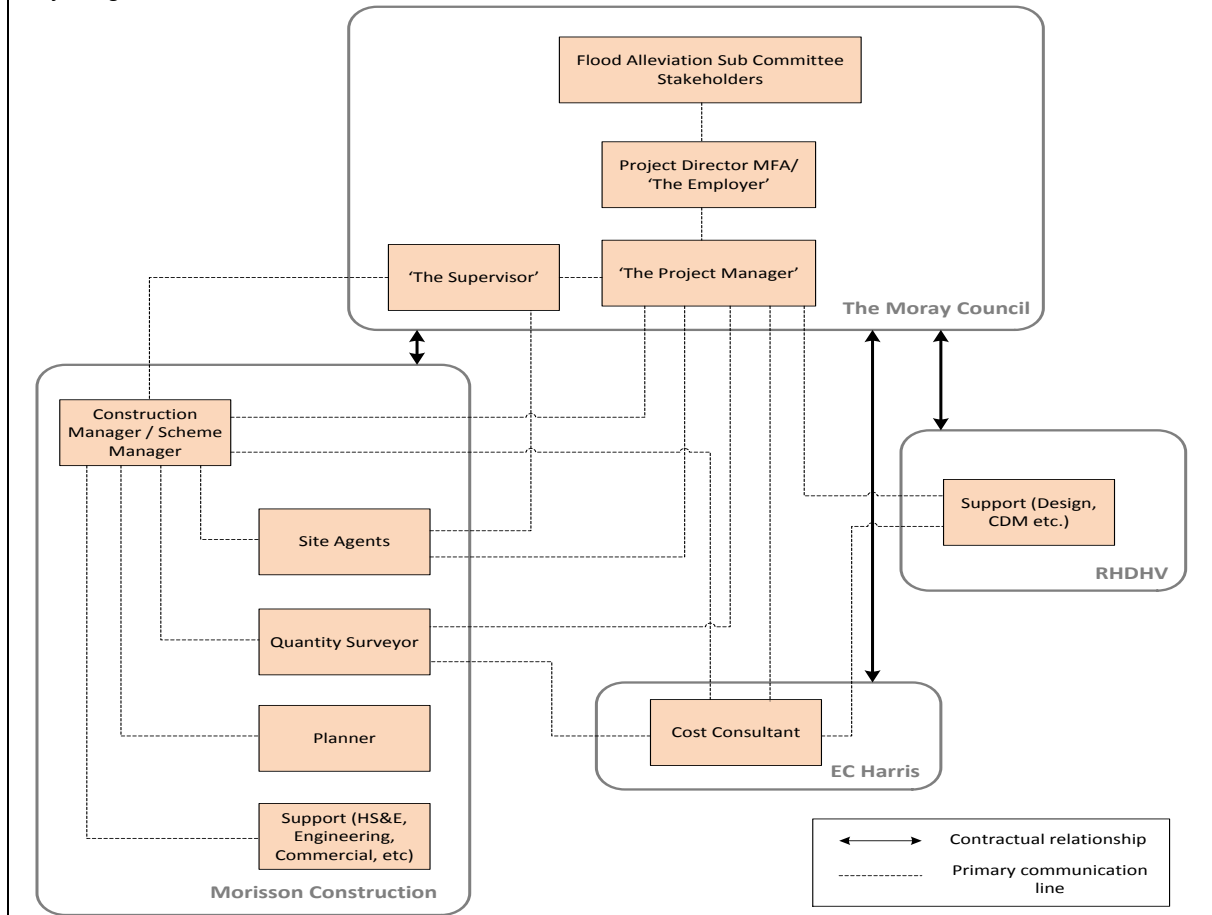
According to the given answers (If there is trust...)
Average score by the interviewees: 50-75% of the efficiency is influenced by trust
10/10 interviewees Efficiency: no unjustified, unreasonable and unexpected variations, therefore less substantiation needed, less time needed to check the variation and its impact and quicker acceptance of the fact that it is a variation to the contract
Average score by the interviewees: 25% of the effectiveness is influenced by trust
5/10 interviewees (#3E, #4P, #5P, #6P and #8C) Effectiveness: 0% influenced, parties are obliged to follow the variations procedure (it has to be a good procedure though).
1/10 interviewees (#4P) Effectiveness: 0% influenced, the Contractor will follow the variations procedure anyway, because variations generate income.
1/10 interviewees (#9C) Effectiveness: 0% influenced, the decision as to whether something is a variation to the contract does not depend on trust.
5/10 interviewees (#2E, #6P, #7C, #8C and #10C) Effectiveness: the parties will co-operate and deal with the variation. If there is no trust, the Employer will say that it is not a variation to the contract, that it is not substantiated adequately etc.)
2/10 interviewees (#1E and #6P) Effectiveness: submit right change option and right impact and no doubts about whether it adds value (trust based on competences and experience).
1/10 interviewees (#1E) Effectiveness: people tend to listen more to each other and act upon it.
1/10 interviewees (#7C) Effectiveness: no need for grey compromises (if there is disagreement about whether something is a variation to the contract)
2/10 interviewees (#1E and #2E) Effectiveness: no unjustified, unreasonable and unexpected variations
1/10 interviewees (#8C) Effectiveness: the parties will follow the variations procedure correctly.
1/10 interviewees (#10C) Effectiveness: it is less likely that disputes will be escalated to the court

7.4 NEC3 ECC: Project Forres Flood Alleviation Scheme

Table 61: General data project Forres (The Moray Council, 2012, 2013)

Project name	Forres (River Findhorn and Pilmuir) Flood Alleviation Scheme
Location	Forres, Scotland
Contract	NEC2 ECC (see Appendix 20 for comparison with the NEC3 ECC)
Law	Scots Law
Project delivery system	Engineering & Construct (E&C)
Employer	The Moray Council (TMC)
Contractor	Morrison Construction
Designer	Royal HaskoningDHV (RHDHV)
Project Manager	The Moray Council/Royal HaskoningDHV
Cost Consultant	EC Harris
Project objective	To protect the town of Forres and surrounding properties from flooding from river flow and rainfall events from the River Findhorn and the Pilmuir catchment, up to approximately a 1 in 200 year return period.
Scope	▪ A96 Road Raising ▪ West Forres Embankment with Grout Curtain ▪ West Forres Embankment ▪ North Forres Embankment and Raising of Waterford Road ▪ Pilmuir Drainage Channel and Pumping Station ▪ Haulage Tracks ▪ River Channel Works (Moy Back Run Works) ▪ River Channel Works (Bends 1, 2 and 3)
Contract sum	€37 million
Contract period	09/2012 - 03/2015
Other essential information	This is the fifth and last project of a 15-year flood alleviation programme in which the Employer, the Contractor, the Designer and the Cost Consultant partnered up to deliver the projects. The original construction contract encompassed the construction of the Lhanbryde scheme and assistance in the design development of the other schemes. The other flood alleviation schemes were all Compensation Events to the original contract.

Project organization



The table above gives an overview of the project data. The project was assessed by means of the assessment models of Chapter 5. The whole assessment can be found in Appendix 31. The next two subsections deal with the trust level and the change management level on the project, respectively. The influence of trust on the change management process is dealt with thereafter.

Discussion of trust on project Forres

Table 62: Assessment model for trust on project Forres

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	3.5
			(2) Seek party with similar culture/policy	3	3.5
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	4
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	3.5
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	3.5
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	3
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	2
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	3.5
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	3.5
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	3.5
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	2
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	3.23

Overall, the level of trust between the Employer and the Contractor is 3.23 out of 4 (see table above), which implies a high trust level. The most decisive aspects which have created that trust level between the parties are elaborated in this section by means of findings in the project records and the interviews, whereas the other aspects can be found in Appendix 31. These are all trust building aspects: the client leadership (x), the Best Value Procurement (1+2), the negotiated contract (6), mutual reasonable and fair behaviour (8), the selection of the right people (8), focus on the target (3), the pain/gain share mechanism (6), a lot of informal communication (9), joint problem-solving (5), open book contract (5), WIN for all parties (3), mutual project objectives (3), and the strategic partnership (x).

According to (Hofstede, 2015), the British culture mainly differs from the Dutch culture in terms of the Masculinity versus Femininity index (MAS). The British culture is masculine/performance oriented, whereas the Dutch culture is feminine/co-operation oriented. Further, Scots law is a mixed legal system containing civil law and common law elements and includes the principle of objective good faith. Interviewees #1E, #2P, and #5C state that this principle does have an indirect influence on the behaviours of the Employer, the Project Manager and the Contractor, because Scots law is embedded in the culture of Scotland. Therefore, many people on this project have dealt with this principle, probably unknowingly, when growing up in Scotland. On this project, the contract is performance oriented, but the Project Team is co-operation oriented. On the one hand, the focus is on performance by means of the pain/gain share mechanism and trust implies enforceable trust (i.e. trust in good performance that is backed up by the option of rewarding and punishing the Contractor). On the other hand, with respect to other matters, trust implies intrinsic trust (i.e. trust that accepts vulnerability) and implicit trust is high on the project. An example of intrinsic and implicit trust on this project given by the interviewees is that if the Employer and the Contractor discuss an element of the works in the contract, the parties will agree that the Contractor will do certain things. In good faith, the Contractor may go and do some necessary additional things and trusts in good faith that the paperwork will tidy itself up later. Another example is that the pain/gain share mechanism also has its risks: the risk of CEs pushing up the target cost and the risk that if the Contractor is involved in the design phase, he would have a temptation to hold back innovations to later in the project. The parties dealt with these risks by discussing them, by saying just be open and by saying that the Employer is aware of the possibility that it could happen, but that the Employer wants to trust the Contractor that the best ideas get out and are included in the target cost, so that the target cost is kept down.

The NEC2 ECC has neither little nor much influence (50%) on the trust level between the parties by means of, for example, the pain/gain share mechanism, the open book requirement, and the negotiated contract. The first aspect increases the parties' focus on the target, the second creates openness and the last creates fairness. The 'mutual trust and co-operation' clause in the NEC2 ECC is not effective in itself, but it does form a good basis for building trust. The intention of the clause is clear, but it remains open to interpretation and cannot be enforced. Therefore, the creation of trust is very dependent on the people involved. Other aspects which have a lot of influence on the trust level are the client leadership and the strategic partnership. The Employer did not want a traditional approach, but rather a collaborative approach. Many things flow from the client leadership, such as the Best Value Procurement, the strategic partnership, the pain/gain share mechanism, the co-location and the integrated Project Team. This is the fifth and last project of a 15-year flood alleviation programme in which the Employer, the Contractor, the Designer and the Cost Consultant partnered up to deliver the projects. The strategic partnership (aspects related to this are indicated with a *) has a lot of influence on the trust level between the Employer and the Contractor, because of, for example, the past co-operations, the lessons learned workshops, and the continuity of staff. In addition, the partnership promotes maintenance of the relationship and good performance. All these aspects are discussed in detail below.

Most decisive for building trust

Procurement

	score
(x) Client leadership in promoting the collaborative approach	3
*(1+2) Best value procurement, European tender	3.5
*(1+2) Multiple award criteria from long-term perspective. The organizational culture, the competences and the benevolence were paramount.	4
*(1+2) The Employer was looking for local representation and a Contractor with long-term employees and wanted to meet the project implementation team rather than the marketing team	3.5

#1E states that essential in first instances in a project is client leadership, because everything else flows from it. The Project Director of The Moray Council (TMC) had experienced the adversarial and inefficient construction industry where, for example, the Employer and the Contractor had a master-servant relationship and the Contractor had a claim mind-set. When he came across the flood programme, he did not want to go down that same road. He wanted a better system where the behaviours of both parties are adapted, the project team is together and in control, the costs are known, what is achievable is known, and the risks can be highlighted to the team members all through the projects. It took the Project Director about 18 months to convince The Moray Council to let go of their very traditional and very adversarial approach as they were not familiar with the concept of a framework. Their big fear was that they were letting a contract for an uncertain amount of money because the parties were not going for a predictable defined cost very early on in the project, and the auditability of the system was also a point of discussion since they wanted to know how they could proof that they got the cheapest. The former can be controlled by only spending what you have by instructing work through the contract, and the latter can be proven by means of quality assessments. Further, before anything would be designed and build they would have to put a huge investment upfront into understanding the right procurement model, the right contracts and how to manage the risks. The collaborative approach is working, because the projects are broadly on time or ahead and are all under budget.

The procurement of the Contractor took place in 2002-2003 and the procurement strategy adopted best practice guidance for construction procurement at that time, which was quite similar to 'best value procurement' nowadays. The aim of the procurement was to award the contract to the Contractor who provided Best Value for Money. For tender evaluation purposes, the Employer applied a quality/price ratio of 70/30. The contract was put out to European tender and the works consisted of constructing the Lhanbryde scheme and assisting in the design development of the other schemes. The other flood alleviation schemes would only be awarded to the Contractor after satisfactory performance and a formal committee approval of an agreed price which complied with the conditions of the contract in order to ensure value for money (The Moray Council, 2006). The procurement route consisted of three stages. The first stage consisted of gathering all tenderers who have expressed interests in the contract and long list of nine contractors was drawn up, which were invited to submit

a response to the pre-qualification exercise of the second stage. The purpose of this exercise was to short list up to five Contractors that have demonstrated capability to contribute towards collaborative working (including in the design), relevant experience and a forward thinking culture, project management ability and familiarity with partnering, target cost contracts and pain/gain share, and cultural convergence with the Moray Flood Alleviation Group and the ability to jointly deliver all the project objectives (Moray Flood Alleviation Group, 2002). Subsequently, the short listed candidates were invited to submit a price and quality bid in the final tender stage, which consisted of three components: a target cost for Lhanbryde, a price for assisting in design development, and a price for other schemes based on the fee percentage applied to the Lhanbryde scheme, where actual cost of this work would be £30 million (The Moray Council, 2006).

The tender stages were sufficient to determine and to demonstrate the contractors' trustworthiness (ability, benevolence, integrity, predictability and reliability) to carry out the project. The tender process was quite thorough. The Contractor had to send in documents for the Employer to review, but there is always the risk that the Employer might get it wrong as the contractors knew what the Employer was looking for and usually they are very good in filling in these quality submissions. Therefore, the Employer engaged in dialogues with the contractors in both tender stages, but particularly in the second stage. One of the things the Employer did was to visit a live construction site with each of the contractors. The purpose was to show the contractors around, to discuss with them how the site was working and to spot the flaws by checking the consistency between their submissions and their behaviours on site (e.g. do they really meant what they said and whether everyone in the organization speaks with the same view). The organizational culture (e.g. how people related to each other, what was the power distance in the organization and how people were enabled), the competences and the benevolence of the contractors were the most important factors in the procurement phase. The Contractor's culture had to match with the team that was already in place which consisted of The Moray Council (the Employer) and Royal HaskoningDHV (the Designer). #1E states that the interviews were quite revealing as some contractors were not very consistent.

During these dialogues and site visits, the Employer did not want to speak with the marketing team, but specifically asked for the people who were actually going to be working on the job. The Employer also checked the CV's and spoke with the referees of these people. The Employer was looking for local representation and a Contractor with long-term employees (more certainty of continuity of people on the projects). Up to now, the core teams of the Employer, the Designer and the Contractor have remained the same, so the Project Team knows what the aims were at the start of the flood programme and is still working to deliver the same goals.

Contract

	score
(1+6) Negotiated contract	3
(6) Joint risk workshop to tailor the risk register specific to the project and to allocate the risks to the party best able to manage them. The Employer's risk allowance covers unforeseen risks.	3
(6) The Contractor's risk allowance was negotiated and is part of the pain/gain share mechanism	3

According to the Project Management Plan (The Moray Council, 2013, pp. 6-7), the Employer and the Contractor organized a risk workshop together to identify and to evaluate contract risks, to apportion risk responsibility and ownership, and to quantify defined and overall risk costs. Clause Z11 in the Contract Documentation adds a risk allocation table to clause 81.1 (and 80.1) in the NEC2 ECC. This table was developed jointly between the Employer and the Contractor during the risk workshop and contains both Employer's and Contractor's risks specific to this project. #1E argues that the risk allocation table was added in order to tailor the risk allocation specific to the project, but that does not mean that there are no disputes about whose risk it was, but the parties have not had many. As a result of the risk workshop, risks are allocated to the party best able to manage them. Both parties have quite some experience, therefore there was a quick consensus on the risk allocation. So, there will be a general understanding about what a fair risk allocation is and what can be expected from a party who carries the risk, which makes the process easier to manage. There are always risks which could be allocated to either party. On this project, it was decided to include a cut-off for such risks. For example, the flood event risk contains a cut-off, so it is not really shared between the parties but rather separated. If it is a flood event up to 1 in 10 years, it

is a Contractor's risk. Beyond that, it is an Employer's risk and a CE. Early on, the parties have defined it as a level on a gauge what a flood event of 1 in 10 years is, so there can be no disputes about that. #1E mentions some examples of the risks being allocated to the party best able to manage them. The Employer takes the fuel price risk for the Elgin project, but the Contractor takes that one for the Forres project, simply because Forres is much shorter of duration. The fuel price is more uncertain over a longer period and puts limits on what the Contractor can do. The same was done for the steel price risk, the Contractor took the risk for the Forres project as it is a shorter contract and less steel was needed on that project. If the risks are allocated inappropriately, it is not very cost-effective because the Contractor cannot manage every risk and to ask him to do anyway, then he can only price them quite conservatively usually. For example, the Employer could have asked the Contractor to take the fuel risk on a four-year contract for the Elgin scheme, but the Contractor can only have managed that by inflating his price because you cannot predict the fuel price in four years from now. The Forres scheme was only a two-year contract and most of the fuel would be needed early, so the Contractor could take that risk and he did.

The target price was negotiated and was quite generous. It was independently audited to check if it was value for money though. The Contractor's risks are included as a risk allowance in the target price and any cost savings (e.g. due to good risk management or if the risks do not materialize) and any cost overruns (e.g. due to underestimated prices) regarding the risk allowance are shared 50/50 with the Employer through the pain/gain share mechanism. If the Employer's risk allowance is not used, the budget savings will be for the Employer. The parties have an understanding that if the risk allowances are needed to be used, they should be used. New unforeseen risks are Employer's risks and are included in the Employer's risk allowance. If the Employer's risks (including unforeseen risks) materialize, they will become CEs. The number of new unforeseen risks is limited though. New construction risks (e.g. quantification risk) are carried by the Contractor.

People

	score
(8) Mutual trust and co-operation clause in the NEC2 ECC is not effective in itself, but forms a good basis for building trust. The intention of the clause is clear, but it remains open to interpretation and cannot be enforced	2
(8+x) The Contractor has set up and organized his management team by checking if people are capable and willing to work in accordance with that 'spirit of mutual trust and co-operation'. It comes down to the individuals involved.	3.5
(8) By large, all parties understand the meaning of good faith and act in good faith	3
*(8+11+x) Past co-operations on the other flood schemes and previous joint lessons learned workshops	3.5
*(8+x) Continuity of staff in all parties	3
*(5) The Project Manager can act impartial and fair by means of help from the Independent Cost Consultant, as he draws up the quotation for CEs	3

Clause 10.1 in the NEC2 ECC states that the Employer, the Contractor, the Project Manager and the Supervisor, (and Adjudicator) shall act in a spirit of mutual trust and co-operation. This clause does not have an influence on the behaviours of the parties, or at least not directly. There are several reasons for that. First, the clause forms a good basis for building trust and to start the project, but the creation of trust is very dependent on the Project Team (i.e. the people who are running the contract)), which is in line with what (Gould, 2007, p. 28) and (Heaphy, 2012, p. 25) state. #3P has worked on three different flood schemes. Each scheme had the same NEC contract and the same Contractor, but the Contractor's teams and the Project Managers were different. The differences between the three teams are noticeable and big regarding trust and co-operation. If you have the right people delivering the project and the right people involved, then you will more likely create 'a spirit of mutual trust and co-operation' and get what you want as the end product. Therefore, #5C argues that the selection of people, how you set up and organize the management team are essential, because you will try to put people in place who are willing and are capable to work that way, and that these words in the contract do have an added value as it implies that if anybody does not act like this, he/she can be asked to be taken off the project. If the parties in the Project Team do not build trust, the Employer has to intervene with, for example, workshops or trying to change people's behaviours. Such interventions were not needed very often and it has been some time since the last one. Everybody knows each other too well and it comes to a point that all parties become dependent on each other and have to work not to let each other down. Second, the 'a spirit of mutual trust and co-operation' cannot be created by words, because words do not really influence people too much. Such culture can be created by, for example, a good working relationships from the start, a clear understanding of what the objectives are

and an agreement that all parties can work together to achieve the common objectives. Third, this clause forms the whole basis of the NEC contracts and everyone adheres to it, and all parties have that understanding of good faith and act in good faith on this project. By the time you get to scheme number 5, it should be an inherent thing that everybody knows. So, at the start of the project, a high level of trust was already in place between the parties which has been built up over time, for example, by means of the continuity of staff, the past co-operations on the other flood schemes and the joint lessons learned workshops. The consistency of the organizations and their people helps to deliver the schemes, to build relationships and to create a working culture together. Long-term employees think further ahead and tend to behave better as they are staying around. The working culture passes on to the many new people coming in. The past co-operations on the previous flood schemes have helped in terms of understanding the systems of the other parties, but on each project it still comes down to the individuals involved. Although there are people who turn up time and time again, the composition of the Project Team on each project is different and is somewhat better or worse than on other projects. The lessons learned workshops from the previous flood schemes also covered the aspect of improving the relationship between the parties. These workshops have been tight team building events as well because of the geographical dispersion of the parties. What the parties also did was, for example, for the Rothies lessons learned the parties brought in the Forres design team so that they could hear first-hand the things which had gone well or badly and the way things could have been done better. The lessons learned have also been valuable for changing the contract style and evolving the contract. Further, according to the interviewees, the intention of the clause is clear, but it cannot be enforced and is open to interpretation. #1E gives an example of the former, how could you go to the Contractor and say: 'I do not consider that you are trusting me or that you are not co-operating with me'. As it is open to interpretation, its effect depends on how the people involved interpret it. #3P states that this project is probably the best out of the three she has worked on regarding trust and co-operation and that it is much easier to work with the Contractor on this project.

The Project Manager plays an important role in the CE procedure. In literature, the Project Manager's dual role (i.e. as the Employer's agent and as a certifier) is the subject of many discussions. The NEC2 ECC does not ask the Project Manager to conduct the CE quotation impartially, but it does say that the Project Manager has to act in the Employer's interest. On this project, the Project Manager is impartial and fair according to the interviewees, which is in line with what the Employer expects from her. The Contractor's team argue that the Project Manager's impartiality is key on NEC projects. Besides being the Employer's agent, the Project Manager is also part of a team with the goal of delivering this project within time and budget. The Project Manager (#2P) argues that so far, she has been quite lucky in as far as there has been enough scope within the budget and the programme, therefore she have not had to say 'no' to things which needed to be done to achieve the project objectives. The Cost Consultant EC Harris is involved in the project to provide independent pre-construction cost estimates and benchmarking of target price and programme, to manage financial aspects of construction contracts and to certify that the costs meet the Council's statutory duty in regard to Best Value, value for money and probity (The Moray Council, 2007). #1E and #3P state that the Cost Consultant draws up the quotation and discusses it with the Contractor. The Cost Consultant is also paid by the Employer, but is independent from the Designer and the Contractor. The Employer expects the Cost Consultant to act fairly. The Project Manager acts on the advice of the Cost Consultant and has to sign of the quotation.

Process

	score
(6) Clear risk allocation	3
*(6) The financial risk is shared by means of a pain/gain share mechanism, which promotes the partnership and encourages the Contractor to be innovative and efficient in order to create a 'gain' for all parties	3
(3+6) Focus on the target in terms of the costs and programme mainly due to the pain/gain share mechanism	3
*(5+8) No unexpected or contentious claims, there is not that contractual drive for the Contractor to make more money and for the Employer to keep the budget tight.	3
(5+6) The pain/gain share mechanism has influence on how CEs are viewed. A 'gain' situation allows more freedom for the parties to be a bit more forgiving.	3
(6) The parties are in a 'gain' situation due to negative CEs as a result of unexpected gains and value engineering	3
*(5+6) Open book regarding the Contractor's cost data	3

*(5+6) CEs are purely for the works, which takes the programme implications out of contention	3
(10) All problems were resolved by amicable agreement within the Project Team	3
(5+9) Informal discussion and agreement prior to sending the formal documents	3
(5+x) Working together and solving problems as a team and challenge each other to achieve the common project objectives	3.5
*(5) Formal and informal early warning meetings	3.5
*(5) Mutual formal and informal early warnings	3
*(9) A lot of informal contact on a day-to-day basis by means of the fulltime co-location	3.5

The risk allocation between the Employer and the Contractor in the contract is clear and works quite well. There are several reasons for that. First, that clarity is created by means of the monthly risk review meetings. All parties (the Employer, the Project Manager, the Contractor, the Designer and the Cost Consultant) attend these meetings to review the risk allocation, to discuss all risks and to reduce the number of risks as time goes on. Second, the Contractor was involved in the risk workshop in which both the Employer's and Contractor's risks were clarified and discussed extensively, and suggestions and comments were made. The risk workshop worked really well and resulted in a risk allocation with which both parties are comfortable. The risk workshop gave the Contractor a lot of opportunity and time to work on the risks and gave the Employer a clear risk allocation with which he was better able to budget the project and to monitor the overall costs. Third, there was Early Contractor Involvement on all projects, which increased the understanding of the risks.

Main Option C was chosen of the NEC2 ECC, which means that the Employer and the Contractor share the financial risk by means of a pain/gain share mechanism. This Option was chosen because it promotes the partnership (e.g. align objectives and culture of trust, co-operation and working together) in order to reduce the costs for everyone. The pain/gain share mechanism creates an ethos where you really need to work closely together to achieve the common objectives so that you could save on the programme and costs in order to create a gain share. The Employer wanted to take out anything what would help the Contractor to gain at the Employer's expense and vice versa, and wanted a contract where there would be an advantage to the Contractor to be innovative and efficient, so that both parties could gain from that. Further, #1E and #5C state that when the contract and the target price was agreed, there were still some elements not fully designed, some consultations not completed, and some of the planning conditions were not signed off. As a result, some elements were not black and white, but it was necessary to start the project anyway because of the funding. Option C is quite flexible as the target cost allows for CEs to increase the target cost in order to accommodate such expected changes. Lump sum is not good if you expect changes. Cost plus is not good for the Employer as the final cost is not known until the project is finished. Option C seemed to be the best option for both parties. The use of Option C was derived from previous flood schemes.

Clauses 60-65 in the NEC2 ECC deals with claims from the Contractor in the form of Compensation Events. #1E, #4I, #5C, and #6C state that there have been a lot of CEs due to all the changes which took place on site (e.g. not closed out planning conditions and value engineering ideas) and quite some new risks (e.g. different ground conditions than expected), but they are still manageable, except for the period of reply due to high workloads and limited resources (e.g. a great number of CEs in a certain period). #5C and #6C state that CEs usually do have an influence on the trust level between the Employer and the Contractor because of the whole claim mind-set of contractors, but on this project both parties behave quite well. #5C argues that the Contractor's team works for a commercial company and focuses on what is best for the company, but if the Contractor loses sight of being fair and just focuses on making profit, it is very easy to lose the Employer's trust and the Contractor is more likely to end up in a dispute with the Employer. In order to maintain the trust between the parties, it is important that Employer is impartial and that the Contractor is reasonable and fair to what the Employer asks. It takes a while to get to the point where both parties act like this. Most people have to struggle with this, as they come from a different background in which it is a kind of natural thing to try to get something extra, and for the Employer it is quite natural to think that the Contractor is going to do that. #6C argues that the parties manage the project well enough in order to understand that they are comfortable with how things are going. Therefore, there is not that contractual drive for the Contractor to make more money and that contractual drive for the Employer to keep the budget tight. There have not been any unexpected claims and none of the CEs was contentious, but all were easily discussed and agreed. #1E argues that all unreasonable CEs will be challenged openly by the Cost

Consultant. #3P mentions that so far, the Cost Consultant only had comments about what is happening on site and the actual amount of work of the CEs performed by the Contractor.

#2P and #6C argue that the pain/gain share mechanism has more influence on how CEs are viewed and on the trust level. On this project, there is more reduced work than additional work (mainly as a result of unexpected gains (better quality of released materials for re-use and better weather conditions resulting in lower river levels) and value engineering (e.g. the grout curtain)), which puts the parties in a 'gain' situation. The 'gain' situation allows more freedom for the parties to be a bit more forgiving, which promotes the development of trust.

#4I states that the target cost and CEs are closely monitored by the Employer's team. The NEC2 ECC is set up as an open book contract, so all parties can check the Contractor's cost data, which creates trust in what the Contractor is submitting. Further, the Contractor produces daily and weekly record sheets, which are checked and signed off by the Employer's Site Supervisor. So the CEs are checked on a couple of levels.

#1E mentions that CEs are only issued for things which have to happen and CEs are purely for the works, which means that the programme implications are not taken into account. For example, it is okay if the Contractor says that he has to extend a wall with 100 meters, but it is not okay if he says that he has to extend the wall, but that it has an impact on the programme and other things, and before you know it this would mean a couple of weeks delay, because the delay would cause a major increase of the target cost due to, for example, extra costs for running the site (e.g. in Elgin it costs £50,000/week). The Employer decided to pay the programme implications through actual costs plus fee. This decision takes the programme implications out of contention, which has been very successful.

All problems were resolved by amicable agreement within the Project Team (i.e. the first two levels). The escalation model is as follows site team > management team > Moray Flood Alleviation Strategic Steering Group. Only a few things were escalated to the highest level to give them a warning and an update about it. The parties do the following to resolve problems by amicable agreement: talking (to understand the details of the problem and the parties' interests), informal discussion prior to sending the formal documents, challenge each other, collaboration and mutual help to find the best solution (i.e. fit for purpose, cost effective and takes into account the total impact of the problem), set a common objective, informal early warning, formal early warning for severe problems, early warning meeting, and monthly progress meeting (platform to solve problems).

The Employer, the Project Manager and the Contractor have informal contact with each other on a day-to-day basis by means of the co-location, which was a deliberate choice by the Employer. The project team members have quite relaxed informal face-to-face contact (instead of email) to clarify points, drawings etc. or to discuss and solve problems prior to sending the formal documents. Further, there is informal contact by telephone and before and after the formal meetings. The Employer is located elsewhere, but the Project Manager is the Employer's representative in the office.

Product

	score
*(3) Achievable and realistic mutual project objectives derived from the mutual objectives in the long term	4
*(3) WIN for all parties on the project and in the long term	4
*(3+6) Other common objectives: partnering over a 15-year period (maintenance of the relationship) and working together on the next flood scheme (all flood schemes are CEs, which promotes good performance)	4
(3+x) The Project Team is delivering the project within time and budget	3

The MFA's mission statement and project objectives are included in the Project Management Plan (The Moray Council, 2013, p. 7). The Mission Statement is 'to deliver flood alleviation for the communities in Moray as soon as possible' and the stated objectives are 'to have no major accidents or incidents, to have a satisfied client and community, to deliver effective flood alleviation as soon as possible, to make most effective use of the team's resources, to develop demonstrably sustainable solutions, and to ensure that the project is commercially viable for all partners'. In addition, a Charter was signed with regard to Health, Safety and Environment. Project objectives were aligned with regard to the project results, the procedures and the relationship. The project

objectives are achieved by working together and solving problems as a team, rather than to finding out who is to blame and is going to pay for it. #6C states that it helps that there is a consistency of people on the projects since 2002, so there are many people who understand those core values of the early stages, and #1E states that the parties are working together on several projects so that the costs of any project problems are very low compared to the overall flood programme costs of 170 million pounds and are not really worth arguing about. The project objectives were derived from the previous flood schemes, which also implies that only achievable and realistic ones were stated. The flood programme objectives have been reviewed over a fifteen-year period since it is not possible to set flood programme objectives which remain relevant all the way through for fifteen years. Therefore, they were adapted for each project to what was relevant at that time. The Elgin PMP was used as a basis to draw up the PMP for this project.

#6C argues that besides the common project objectives, the parties also have other common objectives, which are the next flood scheme and the maintenance of the relationship. All flood schemes are CEs (i.e. the projects were not awarded all at once), which creates an incentive for the Contractor to perform well. The Project Team is delivering the project within time and budget up to now.

Discussion of change management on project Forbes

Table 63: Assessment model for change management on project Forbes

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	3
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	3
			(3) Agree on project philosophy with regard to risk allocation	3	3
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	3.5
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	2
			(6) Update shared databases and incorporate lessons learned for project and organization	4	2
	Recognize change	Change management process	(7) Early identification of potential changes	4	3
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	3
			(9) Document the proposed change in a log	3	3
	Evaluate change		(10) Determine priority of the change	3	2
			(11) Selection of optimum change options by consulting all relevant parties	3	2.5
			(12) Identify the likely impacts of different change options	3	2.5
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	2.5
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	3
			(15) Appropriate documentation to record all decisions within the change process	3	3
			(16) Monitor and record implementation	3	3
	Monitor implementation			3	3
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	2.75

Overall, the level of change management is 2.75 out of 4 (see table above), which implies integrated change management. The most important aspects which have created that change management level are elaborated in this section by means findings in the project records and the interviews, whereas the other aspects can be found in Appendix 31. The most important efficiency and effectiveness creating aspects are: risk management is closely related to change management (4), the joint risk workshop (3), the clear risk allocation (3), the pain/gain share mechanism (3), the aligned risk management objectives (1), the clear risk management procedure (4), the joint risk management (4), the aligned largely proactive risk management approach (4), the clear and streamlined change management procedure (2), the mutual early warning (7), the informal discussions (7), the aligned largely proactive change management approach (7), the open book contract (7-16), the involvement of the independent Cost Consultant (7-16), and no unexpected or contentious variations (7-16). The NEC's extensive CEs procedure also has a downside, which is that it increases the administrative burden for all parties, therefore the period of

reply of CEs is not always met (7-16). On this project, the main focus is on turning risks into cost-saving opportunities. The pain/gain share mechanism encourages such focus.

The NEC2 ECC has much influence (75%) on the change management level on this project, because the change management procedure used is based on the CEs clauses in the NEC2 ECC and because of the pain/gain share mechanism and the open book requirement of Main Option C. The risk management procedure and the mutual early warning obligation are partly based on the NEC2 ECC. All these aspects are discussed in detail below.

Most important for creating an efficient and effective change management process

Efficient and effective: Risk management

	score
(3) Joint risk workshop to tailor the risk register specific to the project and to allocate the risks to the party best able to manage them. The Employer's risk allowance covers unforeseen risks.	3
(3) Clear risk allocation	3
(3) The Contractor's risk allowance was negotiated and is part of the pain/gain share mechanism	3
*(3) The financial risk is shared by means of a pain/gain share mechanism, which promotes the partnership and encourages the Contractor to be innovative and efficient in order to create a 'gain' for all parties	3
(1) Risk management objectives were aligned	3
(4) Clear risk management procedure	3
(4) Joint risk management of the Employer's risks	4
(4) Risk management used to predict the costs to complete and the financial outcome of the project.	3
(4) Overall risk management approach is aligned and is largely proactive, and depends on the people involved.	3
(4) Risk management is closely related to change management	3

The risk allocation was already discussed in the previous section about trust building on the project. The Employer and the Contractor did align objectives with regard to risk management procedures. In the early stages, the parties agreed on the risk register, the regular risk review meetings and the joint reviewing of the risks. The parties also aligned the objectives regarding the risk management results by means of the pain/gain share mechanism. This mechanism and the risk management procedures promote a proactive risk management approach in order to achieve the common project objectives. The parties have a joint interest to make the outcome predictable since unpredictable outcomes affect the reputation of all parties.

According to the PMP (The Moray Council, 2013, pp. 6-7), the client risk register identifies risks, ownership of those risks and actions and will be maintained by the Project Manager. Risk review meetings are attended by the Project Team and are held to monitor risk mitigation actions, to identify opportunities, to plan for future risks, to record actions and to update the register and estimate costs. The risk review meeting seems to be similar to the 'early warning meeting' stated in clause 16.2 and 16.3 in the NEC2. The risk register was not yet included in the NEC2, but it is included in the NEC3 (clause 16.1). The Project Manager (#2P) stresses that the NEC2 ECC contract is not clear regarding risk management, for example, on how to deal with disputes. Therefore, she included risk management plans in the PMP and took the decision to separate out the risk management and early warning processes. These processes are more according to the NEC3, rather than the NEC2. The risk review meetings are general, administrative and regular meetings to update things, whereas the early warning meetings are only held if things are needed to change.

According to the interviewees, the risk management procedure works quite well. The risk review meetings are held every two months and all parties are involved. The Employer's risks are managed by the whole Project Team, whereas the Contractor manages his own risks. The risk review meetings are used to review the risks and to predict the costs to complete. At the moment, the Project Team is fairly comfortable with where it is going financially. #1E stresses that it is really important that the parties manage the time and the costs of the projects due to their reputations. Their reputations have enhanced because the parties have been able to predict where they are going. It does not matter whether it is good or bad news, what matters is that the parties have detected it early and reported it.

The risk management approach by the Employer, the Project Manager and the Contractor during the project is largely proactive. #1E and #2P argue that it is not entirely proactive, because you cannot always predict what is

going to happen. All parties attend the risk review meetings and therefore, everyone understands all project risks and understands what needs to be done to manage the Employer's risks together. The approach comes down to the personalities of the people leading the two teams. Both the Project Manager and the Contractor's Construction Manager have a proactive approach and would rather know about a problem before it hits and try to mitigate it. The focus is to turn risks into cost-saving opportunities, which will increase the gain for all parties.

According to the interviewees, risk management does play a role in the change management procedure and vice versa. Risks need to be reviewed constantly regarding the immediate future and the long-term future, which automatically links in to necessary changes and the management of changes. If there is a risk and it materializes, then change management and a CE are required. If the risk is mitigated or reduced, then change management is not such a prevalent issue. A risk mitigation measure may comprise a change, but it depends on the effect of the change whether it will be implemented or not. The effect of the change (i.e. the reduction of the risk) has to be bigger than the cost of the change. On this project, for example, the Contractor found a change when dealing with the risks of the grout curtain. The geotechnical conditions were unknown, so the grout could get into the river, which would affect the programme and the environment. Therefore the Contractor came up with a value engineering change (i.e. the piling solution) in order to mitigate the risks. The change took away the two big risks for the Contractor and also saved the Employer a lot of money, so it was a gain for both parties. Further, changes may have an influence on the risk probability or impact of other elements.

Efficient and effective: Change management

	score
*(2) Clear, extensive and streamlined change management procedure	2
(7) Mutual formal and informal early warning obligation for variations due to risks and errors in documents	3
(7) Discuss variations informally prior to the formal procedure	3
(7) Overall change management approach is aligned and is largely proactive, and depends on the people involved.	3
(2+7-16) Open book regarding the Contractor's cost data	3
(2+7-16) The Project Manager can act impartial and fair by means of help from the Independent Cost Consultant, as he draws up the quotation for variations	3
(7-16) No unexpected or contentious variations, there is not that contractual drive for the Contractor to make more money and for the Employer to keep the budget tight.	3

The clauses 60-65 in the NEC2 ECC must be applied for dealing with change. These clauses describe the Compensation Event procedure. In addition, the PMP lays down two rules for change management: Changes can only be implemented by a Project Manager's instruction, and the Project Team may initiate a change by submitting a proposal, but a proposed change can only be implemented after the Project Director's approval and the Project Manager's instruction. The two rules were added to the CE procedure to create more control over changes by the Project Manager, which is needed in order to avoid 'preferred' design changes and to put in a second check by making the people who propose the change think about whether it generates benefits or not and whether it is necessary or preferable. The two rules were derived from the lessons learned from the previous flood schemes. The clauses 60-65 in the NEC2 ECC are clear regarding the roles and responsibilities and the type of changes, but not regarding to some processes. There are several things which are open to interpretation and could cause conflicts, but since it is the fifth scheme, such things have been aligned over time between the parties. The parties have come up with a system on the basis of the variation clauses in the NEC2 ECC. The parties are working in accordance with the NEC2, but they never checked how closely the system matches with the NEC2. So it is not clear as to whether all sub clauses in 60-65 in the NEC2 ECC are applied in the change management procedure. The parties probably only apply the ones which are useable.

According to clause 16.1 in the NEC2 ECC, the Contractor and the Project Manager must give an Early Warning by notifying the other as soon as either becomes aware of any matter which could increase the total of the Prices, delay Completion or impair the performance of the works in use. The Project Manager (#2P) took the decision in the early stages that the parties were not going to follow this clause, but this is not documented anywhere. The Project Manager did not want to be swamped with EWs telling her things she already knew. If the Project Manager issues an instruction, she already know it is going to have a cost impact, otherwise she would not have issued it. So she does not want an immediate reply from the Contractor in the form of an EW saying it will affect

the costs. Following this clause would lead to hundreds of EWs and it will affect the Project Manager's focus on the important things. Further, the EW can be abused by the Contractor, which is in line with what (Rowlinson, 2011, pp. 42-44) states. #2P and #3P argue that the sanction in the contract which states that the Contractor loses his entitlement on a CE unless he raised an EW is not helpful because then the Contractor will issue an EW for every single little thing. There will be so many EWs that the EW loses its effect and that the Project Manager cannot distinguish the ones for severe problems from the ones which are purely for administration. Therefore on this project, the parties agreed to discuss matters first to decide whether it is an EW and whether it has an implication, and that an EW will only be issued for serious things, so if it meant that the parties need to get together and talk in order to continue how the parties wanted to. So the EW instigates the parties to have a meeting to discuss what the problem is and how to deal with it, and if the risk cannot be mitigated, you can use the risk allowance. On this project, such EW meetings are usually informal. Formal EW meetings are often not needed because the parties highlight the changes and the circumstances which need to be addressed regularly and mostly the parties are able to agree to an action and to a CE since most solutions are obvious.

It is clear what is meant with the EW obligation in clause 16.1 in the NEC2 ECC. #1E, #3P, #5C and #6C mention that the 'aware' part is open to interpretation. On the one hand, #1E and #6C state that you have to read the NEC in the spirit of things meaning what they would ordinarily mean. Everything has to be taken within the terms of reasonable and that is how the whole contract was intended. The EW is a moral obligation which is closely related to trust. You must trust each other that you are actually going to raise an EW as soon as you become aware. On the other hand, #3P argues that the 'aware' part can be abused by the Contractor as he may give you an EW and at the same time tell you that he cannot work next week or even tomorrow. On this project, it is not like that, but in general, the EW is not a useful tool because it is a tool for the Contractor to beat people with. Further, #5C states that you can be aware of a problem without being aware that it is actually going to affect the contract and the costs. That can cause a conflict if the Contractor does not give an EW for a problem and months later someone raises a CE for the same problem. The Employer might feel gyped and thinks that the Contractor should have told him a long time ago. The parties have not really had to deal with such situations on this project, but it has happened on the other schemes.

The change management approach by the Employer, the Project Manager and the Contractor during the project is largely proactive. All parties have a proactive approach by their involvement in the EW meetings, the risk review meetings and the progress meetings. Everyone is aware of any issues which are materializing, so they can give these attention early on. The approach is not entirely proactive, because there have been some changes which were not anticipated and to which the parties had to be reactive. #3P stresses that the change management approach comes down to people, because on the Elgin project (same NEC contract, same parties, but different Project Team) the approach is entirely reactive. On this project, the Contractor does highlight things early in particular and that it helps that there is trust between the parties. The Contractor is raising these things because they are genuine concerns and the aim is to avoid any adverse impacts. It is not in the Contractor's interest for the job to be inefficient since finishing the project as early as possible will benefit both parties. Further, the Contractor raises any contradictories in the contract documents as issues early on.

The latter three components were already discussed in the previous section about trust building on the project.

Inefficient and ineffective: Change management

	score
(7-16)+T(4) The processing of CEs according to the NEC2 ECC increases the administrative burden for all parties, therefore the period of reply of CEs is not always met.	2.5

According to the interviewees, the Employer, the Project Manager and the Contractor have complied with the change management procedure, except for the period of reply, but overall the system works well. On this project, keeping up with the CEs, the quotations, the checks etc. has been the most onerous part of the procedure. #1E states that not looking into the programme implications in terms of costs for delay has reduced the amount of administrative work considerably and thus made the procedure more efficient. The NEC contract is more formal and rigid than most other contracts, and requires a lot of paperwork. It is difficult to reply everything within two

weeks (about 20% of the formal communication cannot be replied on time) due to, for example, planning, consultations (e.g. request for a design change or a technical query due to an error between the specifications and the bill of quantities), high workloads and limited resources. The Project Manager identified this problem early on, and all parties agreed that it is more relevant to recognize the importance of communications rather than the importance of the period of reply. Therefore, the parties prioritize the importance of communications, which depends on when the party needs the information before it starts affecting the works and the amount of work that needs to be done in order to reply. So the period of reply may be different for every document.

Influence trust on change management process on project Forres

On this project, trust is needed to apply the change management and the risk management procedures correctly in order to increase the efficiency of the change management process. Further, trust is needed to be able to align and to agree on the change management objectives, the risk management objectives and the risk allocation. Some other change management aspects were directly influenced by trust. First, the fulltime co-location makes it easier for the parties to give formal and informal EWs. Second, the joint risk management and the common project objectives encourage the parties to give an early notification of potential variations. Third, trust allows the parties to deviate from formal procedure (i.e. submit change order afterwards in order to increase efficiency). Fourth, the 'gain' situation allows more freedom for the parties to be a bit more forgiving. Fifth, if there is trust, there will be no unexpected or contentious claims. Sixth, if there is trust, there are no doubts about the Project Manager's dual role (i.e. as a certifier and the employer's agent), so there is no need for escalations. Seventh, trust allows the parties to work together and to solve problems as a team and to challenge each other to achieve the common project objectives.

The following table shows the answers given by the interviewees to the question: *irrespective of the project, how much influence does trust between the Employer and the Contractor have on the efficiency and the effectiveness of the change management process?* A five-point scale was applied: 0% = very little influence, 25% = little influence, 50% = neither little nor much influence, 75% much influence, and 100% = very much influence. Even though the question was irrespective of the project, some answers given seem to be applicable to the project as well as they correspond quite well with the links between trust and change management found in the assessment data, but many answers given were not found in the assessment data, maybe it is because the change management process is running quite smoothly, so there were not many remarks about it.

Table 64: The influence of trust on the change management process according to the interviewees of Forres

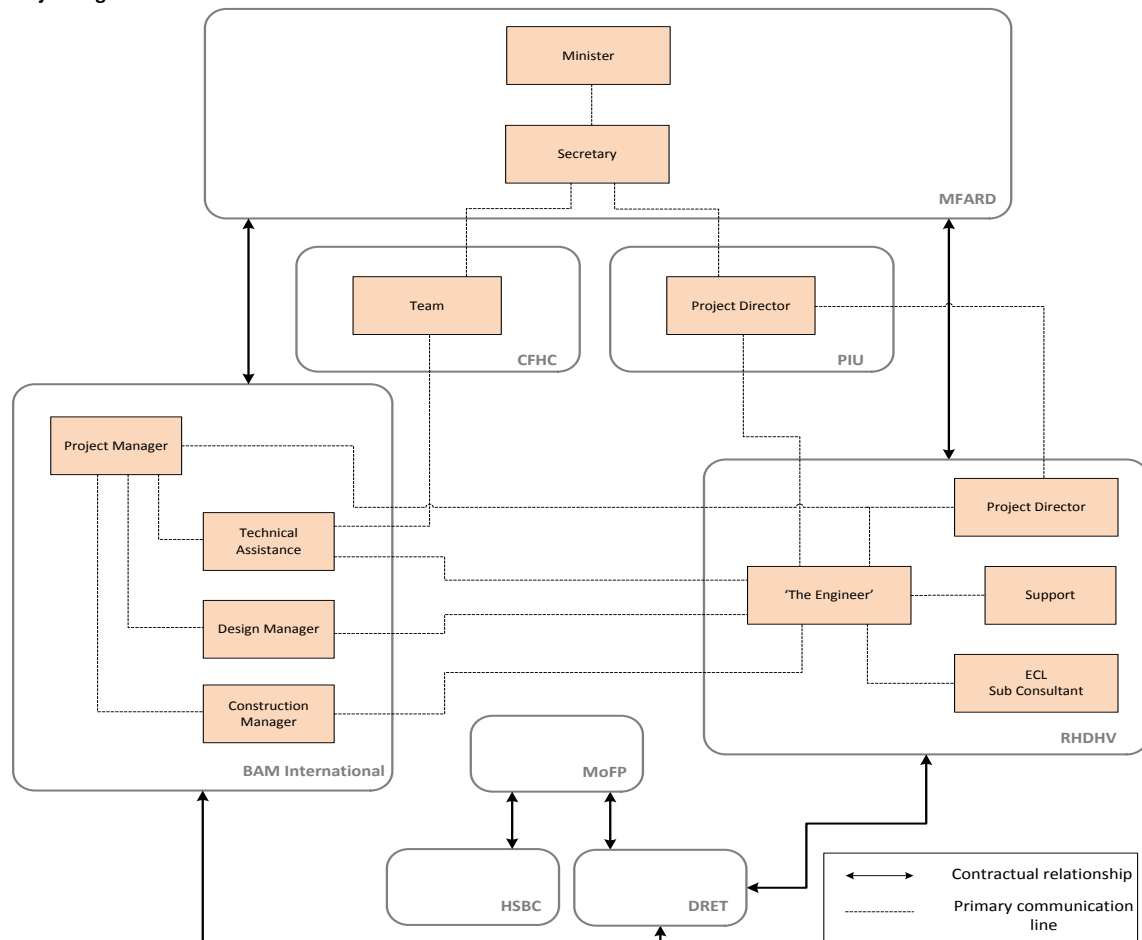
According to the given answers (If there is trust...)
Average score by the interviewees: 75% of the efficiency is influenced by trust
6/6 interviewees Efficiency: less substantiation is needed by the Contractor and less time needed to check and to verify the variation and its impact as the Employer does not expect to find any problems.
1/6 interviewees (#1E) Efficiency: there will be less disputes, because you will put more effort into what is important (i.e. the big figures) and less emphasis on the small stuff.
1/6 interviewees (#6C) Efficiency: the Employer is going to trust that the Contractor is going to manage it efficiently using the right resources and the right time to keep things moving
Average score by the interviewees: 50-75% of the effectiveness is influenced by trust
1/6 interviewees (#2P) Effectiveness: the parties can still achieve a close out in the end, but it will not be a pleasant and quick process
1/6 interviewees (#1E) Effectiveness: more likely to submit correct and verifiable change option and impact
1/6 interviewees (#2P) Effectiveness: less likely to end up in a dispute which may be referred to arbitration or the court
1/6 interviewees (#3P) Effectiveness: the Employer is more likely to accept it and gives you the resources for it as he believes that your judgement is correct and that your goal is at his best interests
2/6 interviewees (#2P, #5C) Effectiveness: less reluctant to agree to the variation or to believe that it is a variation to the contract
1/6 interviewees (#4I) Effectiveness: the parties follow the correct procedures.
1/6 interviewees (#6C) Effectiveness: the parties will believe that the other will meet their expectations and is delivering what he should in terms of the project
1/6 interviewees (#4I) Effectiveness: the Contractor is working towards the same goal or outcome for changes, so does not submit unjustified variations
1/6 interviewees (#1E) Effectiveness: you will not end up in a situation where there will be more and more CEs and so on which will just be rubbish or scold out to come back another day. You will end up with all these CEs being dealt with at the end of the contract.
2/6 interviewees (#1E, #2P) Effectiveness: is also influenced by the efficiency, as 'a minimum use of resources' to implement a change may also be an objective of the change management process.

7.5 FIDIC YB: Project Dikkowita Fishery Harbour

Table 65: General data project Dikkowita (BAM International, 2009; Ministry of Fisheries and Aquatic Resources Sri Lanka, 2006; Vervoorn, 2014)

Project name	Dikkowita Fishery Harbour
Location	Dikkowita, Sri Lanka
Contract	FIDIC Yellow Book
Law	Sri Lankan Law
Project delivery system	Design & Build (D&B)
Employer	Ministry of Fisheries and Aquatic Resources Development, Sri Lanka
Contractor	BAM International
Engineer	Royal HaskoningDHV
Project objective	Create a new fishery harbour to replace inadequate berthing facilities at various locations, to provide allowances for future fleet growth and to provide high standard facilities to increase export possibilities.
Scope	▪ Two breakwaters forming the seaside part of the harbour ▪ Quay walls at the land side of the harbour ▪ Piers for off-loading ships ▪ Lay-by piers for ships ▪ Wave-energy dissipation beach ▪ Land reclamation with slipway within the harbour plot ▪ Landfill at the building area ▪ Processing and service buildings, incl. building utilities ▪ Infrastructure for the works ▪ Dredging of the harbour to the required depths ▪ Roads/Pavement with storm water drainage ▪ Access road with small bridge
Contract sum	€44 million
Contract period	02/2009 – 01/2011
Other essential information	The funding consisted of a grant from Stichting ORET, the Netherlands (25%) and a soft loan (75%) from HSBC Bank

Project organization



The table above gives an overview of the project data. The project was assessed by means of the assessment models of Chapter 5. The whole assessment can be found in Appendix 35. The next two subsections deal with the trust level and the change management level on the project, respectively. The influence of trust on the change management process is dealt with thereafter.

Discussion of trust on project Dikkowita

Table 66: Assessment model for trust on project Dikkowita

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	2.5
			(2) Seek party with similar culture/policy	3	2.5
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	3
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	2
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	2.5
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	1.5
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	2.5
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	2.5
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	2
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	1
TOTAL LEVEL OF TRUST RELATIONSHIP				2.91	2.18

Overall, the level of trust between the Employer and the Contractor is 2.18 out of 4 (see table above), which implies a confident trust level. The most decisive aspects which have created that trust level between the parties are elaborated in this section by means of findings in the project records and the interviews, whereas the other aspects can be found in Appendix 35. The trust building aspects are: the direct negotiations (1), the negotiated contract (6), confidence in each other's competences (8), a lot of informal communication (9), and the Contractor was delivering a high quality product (3). The distrust building aspects are: 10% of the time both parties were mainly trying to defend their ground (8), the Engineer's dual role (5+8), 'like it or lump it' problem-solving (5), some unexpected, unjustified or unreasonably priced variations requests and claims (5), no WIN for all parties anymore (3), the major scope change at the beginning of the project (3), the late 'final scope agreement' (3), and the Contractor did not finish the job (3+10).

According to (Hofstede, 2015), the Sri Lankan culture mainly differs from the Dutch culture in terms of the Power Distance Index (PDI) and the Individualism versus Collectivism index (IDV). The Sri Lankan culture has a large power distance and is collectivistic, whereas the Dutch culture has a small power distance and is individualistic. Further, Sri Lankan law is a mixed legal system containing Roman-Dutch Civil Law and British Common Law elements and includes the principle of good faith. According to the interviewees, the principle of good faith in Sri Lankan law did not have an influence on the behaviours of the Employer, the Engineer and the Contractor as it only becomes important if disputes are referred to the local courts. The FIDIC experts who were interviewed confirm this. FIDIC expert #2 argues that the meaning of 'good faith' and 'reasonable behaviour' differs per culture, therefore the principle of good faith is quite useless in an international contract environment with people from different cultures, like on project Dikkowita. On this project, the Engineer had full authority to act on behalf of the Employer and he did so. The Engineer and the Contractor's key people were all Dutch, so 'trust' should have had the same meaning for them. Therefore, the cultural differences were not really a big issue on the project, there were merely some cultural differences between the Dutch parties and the Sri Lankan Employer, and between the expats and the Sri Lankans in both the Engineer's and the Contractor's teams. For example, it was important for the Engineer to avoid any conflicts in public with the Employer, because in Sri Lanka, behaviours in the meetings are related to hierarchical relationships and 'losing face' is a big issue. Therefore, in case of disagreements, it is better to discuss this another time or to formulate things differently (Vervoorn, 2014, p. 29). Another example is that Sri Lankans do not create 'openness' and 'a good collaboration' by stating this in

agreements. Instead, such aspects can be created by, for example, having a kick-off meeting and involving them in regular meetings in which they are allowed to ask questions.

The FIDIC YB has little influence (25%) on the trust level between the parties by means of, for example, the negotiated contract, the fitness for purpose requirement and the Engineer's dual role. The first aspect creates fairness, the second creates focus, and the last may cause contention between the parties. Other aspects which did have a lot of influence on the trust level are the direct negotiations procurement between the parties (trust) and the funding of the project (distrust). The maximum budget eventually led to distrust between the parties as there was not much contingency to cover unexpected events such as scope changes and claims. All these aspects are discussed in detail below.

Most decisive for building trust and distrust

Procurement

	score
(1) The Contractor took initiative to get the funding together to start up the project	3
(1) Direct negotiations	4

The funding of the project was an important factor for the selection of the Contractor. BAM (the Contractor) took the initiative to get the funding together for the project. Subsequently, the Contractor submitted his proposal to the MFARD of Sri Lanka, so the Contractor was selected by means of direct negotiations in which the Contractor's proposal of 18-10-2006 was assessed. This proposal included the Project Management Plan, the Design Plan and the Schedules for the programme, costs etc. The Contractor's proposal was comprehensive, especially the technical part. Therefore, it was sufficient for the Employer to determine the Contractor's technical competences to carry out the project. The Employer did not request any proof of the financial standing of the Contractor, because BAM International was a well-known Contractor. At the end of the year 2008, the Employer complied with all conditions for the funding of the project in order to start the project.

Contract

	score
(1+6) Negotiated contract	3

The contract was negotiated between the Employer and the Contractor. The amendments to the contract were included in the Particular Conditions.

People

	score
(8) Both parties had confidence in each other's ability to perform	3
(8) 90% of the time the parties were friendly towards each other, but 10% of the time the Employer and the Contractor were mainly trying to defend their ground as good as they can.	2
(8) The Contractor's contract manager was obstructive to moving things forward	
(5+8) The Engineer's dual role (i.e. act reasonable and impartial and on behalf of the Employer)	1.5

Pursuant to §3.1 of the Particular Conditions, the Engineer must act reasonable and impartial. The FIDIC YB did not contain any similar clauses for the Employer and the Contractor. According to the interviewee who was not the Engineer (#2P), the Engineer acted reasonable and impartial in all situations. Both parties had confidence in each other's ability to perform (e.g. the Contractor did deliver a high quality product and was motivated to construct the harbour in accordance with the contract), but there were a few contractual issues. At the organization level, the Employer and the Contractor were reasonable and fair, but at the personal level, some members of the Contractor's team were less reasonable and fair. The Contractor submitted many variation requests, some of which were unreasonable or unreasonably priced. 90% of the time the parties were friendly towards each other, but 10% of the time the Employer and the Contractor were mainly trying to defend their ground as good as they can. The Contractor's Project Manager was removed from the project eventually, because he was obstructive to moving things forward. Thereafter, a senior Project Manager took over his job and it was possible to agree to the 'final scope agreement'.

The Engineer's determination (clause 3.5) plays an important role in both claim procedures. Pursuant to §3.1 of the Particular Conditions and §3.5 of the General Conditions in the FIDIC YB, the Engineer must act reasonable

and impartial. The impartiality of the Engineer was not a problem in the project at the management level, partly because the Engineer did not have the authority to accept force majeure and claims. The Project Director (RHDHV) had this authority. Besides, the Engineer often consulted a senior contract specialist for contractual issues. At the lowest level, there have been some accusations. Since the start of the project, the Engineer acted in such a manner (e.g. sit next to the Employer during meetings) that the Employer would not think he is partial for the Contractor because the Contractor is also Dutch.

Process

	score
(9) A lot of informal communications at all levels on a day-to-day basis by means of the fulltime co-location	3
(5+8) The Contractor submitted some unexpected, unjustified or unreasonably priced variations requests and claims	1
(5) No true collaboration and help to resolve problems, but only informal discussion about claims and the draft determination. (5+8) There was a general willingness to move the project forward on all sides, but the parties merely performed their obligations under the contract to achieve this, rather than really to collaborate together.	2
(10) External input from Engineer's and Contractor's organizations to resolve problems	3
(10) Some management meetings to resolve problems, but sometimes it was difficult to make a compromise. Therefore, it came down to a 'like it or lump it' approach for the Employer.	2
(6) The combination D&B contract, re-measurable quantities and a maximum budget required a lot of work from the Engineer as it may have given rise to problems (e.g. overdimensioning and scope reduction).	2

The Employer, the Engineer and the Contractor have informal contact with each other by means of the co-location. Informal contact between the Employer and the Contractor ran through the Engineer and his team. The Engineer's office and the Contractor's office were located next to each other. The Engineer's team and the Contractor's team had a lot of interaction on different levels. Culture had an influence regarding this subject. The Engineer's team mainly consisted of Sri Lankans, whereas the Contractor's team was more a mix of Sri Lankans and expats. The Contractor's management team consisted of Dutch people only. There was more interaction among the Sri Lankans.

The Contractor submitted many variation requests, some of which were unreasonable or unreasonably priced. Only the unexpected and the unrealistic claims or variations had an influence on the trust level between the Employer, the Engineer and the Contractor, especially between the last two parties because the Engineer took care of many things on behalf of the Employer. It was difficult to make compromises with the Contractor's Project Manager as he acted obstructive and unprofessional, especially near the end of the project. Therefore, issues were often escalated to the management and usually the parties would accept the compromise at this level. If the parties could not come to an agreement at this level, then the approach would be to 'like it or lump it'.

In order to resolve problems by amicable agreement the parties did the following: early notification by the Contractor (so that the Engineer could still adjust things), discuss claims informally, draw up draft determinations first, escalate to management, management meeting (which included project directors and contract specialists of Engineer's and Contractor's teams), and make compromises in order to move things forward. There was a general willingness to move the project forward on all sides, but the parties merely performed their obligations under the contract to achieve this, rather than really to collaborate together. The Engineer tried to find solutions which are mutually accepted by the parties. In first instance, the Engineer tried to reach consensus with the Contractor through informal meetings about the variations and the claims, which did not work as the Contractor was not willing to co-operate and to make compromises. Thereafter, the Engineer used arguments and a draft determination, but it remained difficult to come to an agreement. Therefore, some variations and claims were escalated to the management level. In those meetings, the parties usually agreed on the proposed solution.

All problems were resolved by amicable agreement. However, some issues were escalated to the management level (i.e. external input from the Engineer's and Contractor's organizations) and the claim regarding the bridge-road connection was escalated to the Ministries of the Netherlands and Sri Lanka. #2P states that the claims reached a stage where the Parties had stated their positions but neither wanted to take the claims to the DAB or full arbitration, the compromise was a negotiated agreement where programme and cost matters were agreed and the final scope agreement was signed. The intent was to move the project forward rather than get caught

up in protracted claims procedure. The final scope agreement did help move things forward initially, but then some problems (the bridge-road connection being the main item) arose. The 'new' issues were attempted to be resolved under the contract procedures but by then both Employer and Contractor had become entrenched in their positions again.

According to the Particular Conditions clause 14.1, the Contract Price consisted of the lump sum Accepted Contract Amount plus the quantities subject to re-measurement. The parties chose to work with re-measurable quantities (e.g. for the length of sheet piles, but not the type or quality, and the quantity of stones for the breakwater), because the geotechnical conditions were unknown. The amendment was probably at the request of the Contractor. A Design & Build contract in combination with re-measurable quantities is unusual and can indeed be misused by the Contractor since he determines the price schedule and the design. If the quantities are much more than anticipated, the Employer may need to cut down the scope due to the maximum budget. Further, the contract management of this project was comprehensive for the Engineer, partly because of the major scope change and these re-measurable quantities. The major scope change did result in some cost-savings as some parts were re-measurable.

Product

	score
(3) The Contractor was delivering a high quality product	3
(3) Major scope change at the beginning and the 'final scope agreement' was only reached near the end of the project.	2
(3+10) The Contractor withdrew from the bridge-road solution and did not finish the job.	2
(3+10) The Employer did not have many resources (e.g. sanctions or incentives) to control the Contractor.	2
(3) At the end of the project, there was most likely no WIN situation for all parties anymore due to the scope change (i.e. harbour also suitable for large ships) and the disputed bridge-road connection.	2

The project objective regarding the result (scope, cost, time, quality etc.) was defined in the contract and constitutes the realisation of a harbour combined with training and capacity building for the harbour manager (CFHC). At the start of the project the Employer wanted to change the project result: with the same budget, a harbour must be build which was also suitable for larger ships. The latter was a wish from the harbour manager. The Contractor did not want this variation because there was no budget for it, they wanted to deliver the project according to the original contract. Several months after the start of the project, the most important variation was instructed, which was to make the harbour partly suitable for larger ships. Near the end of the project (25-11-2011), the Employer and the Contractor reached a 'final scope agreement' in which was the parties agreed to build the harbour as complete as possible with the available budget.

The Contractor did comply with the 'final scope agreement', except for one matter. The Contractor issued an unjustified variation and claim for the bridge-road connection (i.e. it was due to his own error), therefore the Engineer rejected these. The parties did agree on a joint solution, but while the Employer was implementing his part of the solution, the Contractor decided to withdraw. The Employer did not have many resources to make the Contractor to finish the job. Payments could not be withheld because the project was financed by ORET. The Employer could only have the Engineer issue a claim for delayed completion. In the end, the job had to be finished by another contractor for at least 5 times as much money.

At first instance, there seemed to be a WIN situation for both parties due to the direct negotiations procedure, otherwise the Contractor would not have taken on the project. It is doubtful whether there was still a WIN situation for all parties at the end. The Employer's objective was to increase and to improve the quality of the fishery. Eventually, this objective was achieved, because the harbour was complete and of high quality, but the bridge-road connection had to be constructed by another contractor for at least 5 times as much money. The Contractor's objective was to deliver the harbour according to the contract, within available time and budget, and with a profit. The Contractor did deliver an almost complete and high quality harbour, but both interviewees do not know whether his profit margins were as expected. #1P argues that the Contractor probably made less profit or even a loss with the project.

Discussion of change management on project Dikkowita

Overall, the level of change management is 2.28 out of 4 (see table below), which implies systematic change management. The most important aspects which have created that change management level are elaborated in this section by means of findings in the project records and the interviews, whereas the other aspects can be found in Appendix 35. The most important efficiency and effectiveness creating aspects are: the aligned change management objectives (1) and the clear change management procedure (2). The most important inefficiency and ineffectiveness creating aspects are: the Engineer's dual role (7-16), the Engineer has no authority to give instructions for variations (7-16), the timelines tended to drift after initial notification (7-16), the project funding and associated requirements (7-16), the unexpected, unjustified or unreasonably priced variations requests and claims (7-16), the unaligned change management approach (7), the identification of potential variations by means of claims notifications (7), and risk management is not closely related to change management (4). On this project, the main focus is on the 'gaps in the contract' due to a changed circumstance or new information.

The FIDIC YB has neither little nor much influence (50%) on the change management level on this project, because the change management procedure used is based on the change management clauses in the FIDIC YB and because of the Engineer's dual role and the claims notice. Some steps were added to the procedure though due to the funding of the project. All these aspects are discussed in detail below.

Table 67: Assessment model for change management on project Dikkowita

Objective	Phase	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	2
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	2.5
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	2.5
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	2
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	1
			(6) Update shared databases and incorporate lessons learned for project and organization	4	1
	Recognize change	Change management process	(7) Early identification of potential changes	4	2.5
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	3
			(9) Document the proposed change in a log	3	3
	Evaluate change		(10) Determine priority of the change	3	2
			(11) Selection of optimum change options by consulting all relevant parties	3	2.5
			(12) Identify the likely impacts of different change options	3	2.5
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	2
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	3
			(15) Appropriate documentation to record all decisions within the change process	3	2
	Monitor implementation		(16) Monitor and record implementation	3	3
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	2.28

Most important for creating an efficient and effective change management process

Efficient and effective

	score
(1) Change management objectives were aligned regarding the procedure and the results	3
(2) Clear change management procedure	3

The Employer and the Contractor did align objectives with regard to change management. The results (i.e. stay within the budget and there must be an agreement between the Employer and the Contractor with respect to variations) and the procedures were aligned.

The variations procedure was set out in the Project Management Plan and deviated slightly from the one in FIDIC YB §13. Pursuant to the Particular Conditions §13.1, the Engineer is not allowed to give a direct instruction for a

variation unless the Employer and the Contractor have agreed upon the impact. In addition, there was an extra step which consisted of checking whether there are sufficient funds to carry out the variation. The variations procedure deviated because of the funding of the project (i.e. there was a maximum budget). The processes, the roles and responsibilities, and the type of variations claimable are clear in the FIDIC YB. #2P argues that on projects of this nature (marine civil engineering) the change / variations will tend to occur in the obvious locations (i.e. the physical works, the ground conditions, the weather etc.).

Inefficient and ineffective

	score
(2+7-16) The Engineer's dual role (i.e. act reasonable and impartial and on behalf of the Employer)	1.5
(2+7-16) Due to the mutual change management objective to stay within the budget, the Engineer was not authorized to give instructions for variations, which had a paralyzing effect on his job and slowed things down	2
(7-16) Timelines tended to drift a little after the initial notification because the Contractor wants to have a better overview of the full impact of the variation.	2
(7-16) Variations process not as efficient due to the project funding, the maximum budget and the required agreement between the Employer and the Contractor	2
(7-16) The Contractor submitted some unexpected, unjustified or unreasonably priced variations requests and claims	1
(7) The change management approaches of both parties were not aligned	2.5
(7) Only early identification of potential variations by means of the notification of claims	2.5
(4) Risk management is not closely related to change management	2

The limitation of the Engineer authorization to give instruction for variation had a paralyzing effect and slowed down the procedure. The Employer, the Engineer and the Contractor did comply with the variations procedure. However, #2P argues that it tended to drift a little after the initial notification, which is not uncommon. #1P also mentions that the system was not always efficient due to the funding of the project. The communication with ORET about variations was not included in the contract, which sometimes caused delays when the Contractor did not co-operate.

#1P states that the Contractor submitted many variation requests, some of which were unreasonable or unreasonably priced. Only the unexpected and the unrealistic claims or variations had an influence on the trust level between the Employer, the Engineer and the Contractor, especially between the last two parties because the Engineer took care of many things on behalf of the Employer. It was difficult to make compromises with the Contractor's Project Manager as he acted obstructive and unprofessional, especially near the end of the project. Therefore, issues were often escalated to the management and usually the parties would accept the compromise at this level. If the parties could not come to an agreement at this level, then the approach would be to 'like it or lump it'.

The change management approach by the Employer and the Contractor during the project was half reactive/half proactive to largely proactive. #1P argues that, for example, at the beginning, the Employer immediately notified the variation to make the harbour suitable for larger ships, but the Employer failed to elaborate the new plans due to a lack of capacity. The Contractor was very proactive in terms of elaborating the new plans. §8.3 in the FIDIC YB contains an early warning provision. The Contractor must notify the Engineer for future events or circumstances which may have a negative impact on the works, the costs or the programme. This early warning obligation did not play a role in the variations procedure, but the Contractor's notification of claims did.

Risk management is not closely related to change management

Influence trust on change management process on project Dikkowita

On this project, trust is needed to apply the change management procedure correctly in order to increase the efficiency of the change management process. Further, trust is needed to be able to align and to agree on the change management objectives and the risk allocation. Some other change management aspects were directly influenced by distrust. First, if the Contractor receives less profit than expected, they will issue more unreasonable and unreasonably priced variations and claims to generate profit. Second, if there is distrust, there will be doubts about the Engineer's dual role (i.e. as a certifier and the employer's agent) and escalations will be needed. Third, if there is distrust, the timelines tend to drift a little after the initial notification because the

Contractor wants to have a better overview of the full impact of the variation. Fourth, if there is distrust, there will be less co-operation and it would be difficult to make compromises, so the parties apply a 'like it or lump it approach'.

The following table shows the answers given by the interviewees to the question: *irrespective of the project, how much influence does trust between the Employer and the Contractor have on the efficiency and the effectiveness of the change management process?* A five-point scale was applied: 0% = very little influence, 25% = little influence, 50% = neither little nor much influence, 75% much influence, and 100% = very much influence. Even though the question was irrespective of the project, many answers given seem to be applicable to the project as well as they correspond quite well with the links between trust and change management found in the assessment data.

Table 68: The influence of trust on the change management process according to the interviewees of Dikkowita

According to the given answers (If there is trust...)
Average score by the interviewees: 75% of the efficiency is influenced by trust
1/2 interviewees (#1P) Efficiency: less time needed to check the variation and its impact.
1/2 interviewees (#1P) Efficiency: the parties are willing to co-operate
Average score by the interviewees: 50% of the effectiveness is influenced by trust
1/2 interviewees (#1P) Effectiveness: easier to achieve a higher goal due to collaboration (i.e. co-operation and thinking along).
1/2 interviewees (#1P) Effectiveness: is also influenced by the efficiency, as this is often an objective as well due to a maximum budget.

8. Comparative analysis

This chapter deals with the last sub question: What can be learned by comparing the four case study results with regard to the influence of mutual trust between the client and the contractor on the efficiency and the effectiveness of the change management process on complex D&B infrastructure projects? The objective of this sub question is validate the assessment results of the case study projects by means of comparing them in order to determine why and how much the efficiency and the effectiveness of the change management process are influenced by mutual trust between the Employer and the Contractor, to determine which aspects are fundamental for building trust on every project, and to determine which other trust building and efficiency and effectiveness creating aspects should be applied on every project. The findings with respect to the latter two sub objectives are used to state recommendations for the UAC-IC 2005 regarding an efficient and effective change management process based on trust. The first sub section discusses how the four case study projects were compared to achieve those sub objectives. The sub section thereafter deals with the results of the comparative analysis.

8.1 Setup of the comparative analysis

The sub objectives (O) of the comparative analysis and methods (M) to achieve them are:

O1: To determine why and how much the efficiency and the effectiveness of the change management process are influenced by mutual trust between the Employer and the Contractor.

M1: Compare the results from every project in terms of influence trust on the change management process and draw conclusions by means of the analytic tactics ‘making contrasts/comparisons’ and ‘counting’ by (Miles et al., 2013, pp. 282-284) (see Appendices 36 and 40 for the comparison). A part of the comparison table can be seen below. All similar arguments given by the interviewees and links between trust and change management derived from the empirical data were placed in one row, which makes it easier to compare them. An arrow (↓) indicates that the matter applies in case of distrust. The author also checked whether these arguments given and the links derived overlap. The most important relationships between trust and the change management process according to the interviewees and the author are highlighted grey. The results of the comparison are discussed in the next sub section.

Table 69: Example of the comparison table regarding the influence trust on the change management process

Bijlmerweide	Drachtsterweg	Forres	Dikkowita	Comparison
Indirectly influenced by trust (Trust is needed to...)				
Apply the CM procedure correctly or accept any deviations from it	Apply the CM procedure correctly	Apply the CM procedure correctly	Apply the CM procedure correctly	Apply the CM procedure correctly
Directly influenced by trust (If there is trust/distrust...)				
-	Works offered at a low price > more questionable variations to generate profit ↓	No unexpected or contentious claims	Less profit than expected > more unreasonable and unreasonably priced variations and claims to generate profit ↓	WIN situation for the Contractor > No unexpected, unjustified and unreasonably priced claims and variations
According to the given answers (If there is trust...)				
-	5/10 Effectiveness: the parties will co-operate and deal with the variation. If there is no trust, the Employer will say that it is not a variation to the contract, that it is not substantiated adequately etc.)	2/6 Effectiveness: less reluctant to agree to the variation or to believe that it is a variation to the contract	1/2 Effectiveness: easier to achieve a higher goal due to collaboration (i.e. co-operation and thinking along).	Effectiveness: the parties are less reluctant to agree to the variation, to believe that it is a variation to the contract, to co-operate and to deal with the variation. By means of collaboration (i.e. co-operation and thinking along) it is easier to achieve a higher goal.

O2: To determine which aspects are fundamental for building trust on every project.

M2: Compare the decisive aspects from every project per cluster in terms of trust and distrust building and draw conclusions by means of the analytic tactics ‘clustering’, ‘making contrasts/comparisons’, ‘counting’ and ‘noting’

patterns' by (Miles et al., 2013, pp. 277-284) (see Appendices 37 and 40 for the comparison). A part of the comparison table can be seen below. All trust and distrust building aspects were placed in one row per cluster, which makes it easier to compare them. One arrow (↓) indicates that the aspect could be applied better to create trust, and two arrows (↓↓) indicates that the aspect is creating distrust. At least two aspects the same on the projects means it is important, so these will be included in the 'comparison table'. The author can also override this rule if an aspect seems to be really important and needs to be included in the 'comparison' table. Such aspects are highlighted grey. Last, the 'noting patterns' tactic was applied to find the fundamental trust building aspects which occurred on all four projects.

Table 70: Example of the comparison table regarding the decisive trust aspects

	Bijlmerweide	Drachtsterweg	Forres	Dikkowita	Comparison
PROCUREMENT	(1+2) Direct agreement procedure, National tender. The Employer was allowed to select the contractors of his own choice (1) The tender team is the same as the project implementation team (1) Requirements on the personal level were merely based on the technical competences ↓ (1) MEAT award criterion: only based on price and quality ↓	(1) MEAT award criterion was not applied correctly and did not include the technical proposals, as a result it became a lowest price procurement ↓↓	(x) Client leadership in promoting the collaborative approach *(1+2) Best value procurement, European tender *(1+2) The Employer was looking for local representation and a Contractor with long-term employees and wanted to meet the project implementation team rather than the marketing team *(1+2) Multiple selection and award criteria from long-term perspective. The organizational culture, the competences and the benevolence were paramount.	(1) The Contractor took initiative to get the funding together to start up the project (1) Direct negotiations	(1) Client or Contractor leadership (1+2) The possibility to select the winning tender on the basis of the assessment of the Contractor's trustworthiness (ability, benevolence, integrity, predictability and reliability) (1) The involvement of the project implementation team in the tender phase to check whether they are able and willing to work in accordance with how the Employer's way of working. (1) The use of the MEAT award criterion: price and quality. (2) The use of other criteria: the Contractor's organizational culture and benevolence

O3: To determine which other trust building and efficiency and effectiveness creating aspects should be applied on every project.

M3: Compare all trust building and efficiency and effectiveness creating aspects from every project and draw conclusions by means of the analytic tactics 'making contrasts/comparisons' and 'counting' by (Miles et al., 2013, pp. 282-284) (see Appendix 38, 39 and 40 for the comparison). A part of the comparison table regarding change management can be seen below.

Table 71: Example of the comparison table regarding the efficiency and effectiveness creating aspects

CM criteria	Bijlmerweide	Drachtsterweg	Forres	Dikkowita	Comparison
(2) Clearly defined change management procedure and roles or responsibilities therein	(2) Clear and efficient change management procedure N/A	(2) Clear and efficient change management procedure N/A	*(2) Clear, extensive and streamlined change management procedure (2) Open book regarding the Contractor's cost data	(2) Clear change management procedure N/A	(2) Clear and efficient change management procedure (2) Open book regarding the Contractor's cost data
(7) Early warning	(7) Early informal notification of variation by means of phone call or email	(7) EWs given by the Employer are not appreciated ↓ (7) The standard warning obligation and the extra warning obligation are not fully effective ↓↓	(7) Mutual formal and informal early warning obligation for variations due to risks and errors in documents	(7) Only early identification of potential variations by means of the notification of claims ↓	(7) Mutual formal and informal early warning obligation for variations due to risks and errors in documents

To a large extent, the method is similar to method 2. All trust building aspects were placed in one row per trust criterion, and all efficiency and effectiveness creating aspects were placed in one row per change management criterion, which makes it easier to compare them. In the trust table, one arrow (↓) indicates that the aspect could be applied better to create trust, and two arrows (↓↓) indicates that the aspect is creating distrust. The arrows have a different meaning in the change management table, one arrow (↓) indicates that the aspect could

be applied better to create an efficient and effective change management process, and two arrows (↓↓) indicates that the aspect is creating an efficient and effective change management process. The most effective aspects for creating trust or an efficient and effective change management process are highlighted grey. At least two aspects the same on the projects means it is important, so these are included in the 'comparison table'. If they also happen to be highlighted grey, they will also be grey in the 'comparison' table. The author can also override this rule if an aspect seems to be really important and needs to be included in the 'comparison' table. Such aspects are highlighted black.

8.2 Comparison of the four case study results

Influence trust on the efficiency and effectiveness of the change management process

In the previous chapter, the direct and indirect links between trust and the efficiency and the effectiveness of the change management process on all four projects were derived from the assessment data. In addition, the interviewees were asked about this subject. They had to indicate how many % of the efficiency and how many % of the effectiveness of the change management process is influenced by trust between the Employer and the Contractor and why. Even though the question was irrespective of the project, many answers given by the interviewees seem to be applicable to the case study project they were involved in as well. An overview of all findings about the influence of trust on the change management process can be found in Appendix 36. This sub section deals with the most important relationships between trust and the change management process.

Influence trust on the efficiency of the change management process

According to the interviewees, trust between the Employer and the Contractor has much influence (about 75%) on the efficiency of the change management process. The interviewees were more or less unanimous with respect to this subject in terms of the amount of influence and the substantiations for it. Their main argument is that if there is trust, there will be no unjustified, unexpected and unreasonably priced variations. As a result, the Contractor has to submit less substantiation of the variation, and the Employer does not expect to find any problems, needs less time to check the variation and its impact, and there will be a quicker acceptance of the fact that it is a variation to the contract. Further, if there is trust, the Contractor has more focus on the target and is going to manage the process efficiently using the right resources and the right time to keep things moving (e.g. to increase efficiency, continue the works and submit change orders afterwards). These two arguments were also derived from the assessment data of the projects. Other relevant arguments derived from this data are that trust is needed to apply the change management procedure correctly in order to increase the efficiency and that trust instigates the parties to notify any potential variations early on.

Influence trust on the effectiveness of the change management process

As stated by the interviewees, trust between the Employer and the Contractor has neither little nor much influence (about 50%) on the effectiveness of the change management process. The answers given were not that unanimous as they were for 'efficiency' in terms of the amount of influence and the substantiations for it and for many interviewees it was much more difficult to answer this question. Therefore, different percentages and several answers were given. First, many interviewees argue that the effectiveness is 0% influenced by trust, because the parties are obliged to follow the variations procedure anyway (it has to be a good procedure though). Second, if there is trust, the Contractor will more likely submit a right and verifiable change option and impact (trust based on competences and experience) and the Employer has less doubts about whether it is a right change option and whether it adds value, so he is more likely to accept it as he believes that the Contractor's judgement is correct and that the Contractor's goal is at his best interests. Third, if there is trust, the parties will follow the variations procedure correctly. Fourth, if there is trust, the Contractor is working towards the same goal or outcome for changes, so he does not submit unjustified, unreasonable and unexpected variations. Fifth, if there is trust, the parties are less reluctant to agree to the variation, to believe that it is a variation to the contract, to co-operate and to deal with the variation. By means of collaboration (i.e. co-operation and thinking along) it is easier to achieve a higher goal. The latter three arguments were also derived from the assessment data of the

projects. Further, the effectiveness is also influenced by the efficiency, as ‘a minimum use of resources’ to implement a change may also be an objective of the change management process due to a maximum budget.

Fundamental trust building aspects

The previous sub section showed that trust has quite some influence on the efficiency and the effectiveness of the change management process. Therefore, it is important to know how to build trust in order to achieve a good change management process. The comparison of the decisive trust and distrust building aspects from every project concluded with two fundamental aspects for building trust: ‘a WIN-WIN situation throughout the project’ and ‘a clear and aligned client leadership’. These two aspects are irrespective of the standard form of contract as they occur on all four projects, in other words, the contract is not that fundamental for building trust. The creation of trust and distrust rather stems from how the parties act and which project management systems, tools and so on the parties apply on the project. The two tables below show the findings of the case study projects with regard to these two fundamental aspects. The findings are elaborated per project below.

Table 72: WIN-WIN situation on the four case study projects

Bijlmerweide	Drachtsterweg	Forres	Dikkowita
WIN-WIN situation			
(1) No significant amendments to the UAC-IC 2005 (3+x) WIN for all parties and understand each other's interests (3+8) Informal incentive for the Subcontractor (prestigious project), so not merely wants to make profit	(1+5) <i>'Like it or lump it' contract which contains many amendments</i> ↓↓ (3) Win-partial win situation due to lowest price tender ↓ (3+5+8) No other mutual objectives besides fitness for purpose, therefore the objectives remained contradictory ↓ (6) <i>Risks are allocated to the party best able to manage them, except for the geotechnical conditions</i> ↓	(1+6) Negotiated contract (6) <i>Joint risk workshop to tailor the risk register specific to the project and to allocate the risks to the party best able to manage them. The Employer's risk allowance covers unforeseen risks.</i> (6) <i>The Contractor's risk allowance was negotiated and is part of the pain/gain share mechanism</i> * (6) The financial risk is shared by means of a pain/gain share mechanism, which promotes the partnership and encourages the Contractor to be innovative and efficient in order to create a 'gain' for all parties	(1) Negotiated contract (3) Major scope change at the beginning and the 'final scope agreement' was only reached near the end of the project ↓ (3) At the end of the project, there was most likely no WIN situation for all parties anymore due to the scope change (i.e. harbour also suitable for large ships) and the disputed bridge-road connection ↓
Consequences			
(8) Reasonable and fair behaviour of both parties (8) The Contractor's goodwill, passion and motivation to deliver a good project	(3+8) The collaboration agreements (openness, focus on the target, timeliness etc.) are quite standard and are not fully effective due to contradictory interests ↓ (8) 'Us versus them' behaviour and no mutual reasonable and fair behaviour at the lowest level ↓ (8) Good faith in the DCC only has influence at the highest escalation level ↓ (5+6) Disagreement about the responsibility of the unexpected geotechnical conditions ↓↓	*(5+8) No unexpected or contentious claims, there is not that contractual drive for the Contractor to make more money and for the Employer to keep the budget tight. (6) Clear risk allocation (6) The parties are in a 'gain' situation due to negative CEs as a result of unexpected gains and value engineering	(6) The combination D&B contract, measurable quantities and a maximum budget required a lot of work from the Engineer as it may have given rise to problems (e.g. overdimensioning and scope reduction) ↓ (5+8) The Contractor submitted some unexpected, unjustified or unreasonably priced variations requests and claims ↓↓ (8) 90% of the time the parties were friendly towards each other, but 10% of the time the Employer and the Contractor were mainly trying to defend their ground as good as they can. (8) The Contractor's contract manager was obstructive to moving things forward ↓ (10) External input from Engineer's and Contractor's organizations to resolve problems (10) Some management meetings to resolve problems, but sometimes it was difficult to make a compromise. Therefore, it came down to a 'like it or lump it' approach for the Employer ↓ (3+10) The Contractor withdrew from the bridge-road solution and did not finish the job ↓

On project Bijlmerweide, a WIN-WIN situation and a clear and aligned client leadership are present. Although not explicitly stated, there seems to be a WIN situation for all parties (i.e. the Employer, the Contractor and the Subcontractor). As a result, all parties act reasonable and fair. The client leadership entails drawing up clear Employer's Requirements (ER) and finding the right Contractor by means of the procurement procedure and the award criteria. During the Project Start Up, the parties discussed the client leadership in terms of the parties' roles and responsibilities on the project and their expectations. During the project, the Employer is not involved on a day-to-day basis and mainly controls the project by means of the Quality Management System to check whether the Contractor complies with the ER, and a lot of informal contact with the Contractor. So far, the collaboration between the parties is good.

On project Drachtsterweg, there is a problem with both the WIN-WIN situation and the client leadership. There does not seem to be a WIN-WIN situation due to the many unilateral amendments to the UAC-IC 2005 to the disadvantage of the Contractor, the lowest price tender, and the contradictory interests of the parties. The WIN-PARTIAL WIN situation has often led to many disagreements between the parties and mutual unreasonable and unfair behaviour in case of problems. The client leadership is traditional on this project as the Employer's team is very much on top of everything by means of the many meetings, the problem-solving (technical and financial), the many documents requested for acknowledgement and so on. However, such client leadership was not fully aligned with the Contractor, while the Contractor considers themselves to be in the lead and thinks that the Employer is too much involved in accordance with a D&B contract. As a result, the collaboration between the parties is not optimal as both parties want to lead the project in different ways. The latter is strongly related to the contradictory interests of the parties and the safeguarding of those.

Table 73: Clear and aligned client leadership on the four case study projects

Bijlmerweide	Drachtsterweg	Forres	Dikkowita	
Clear and aligned client leadership				
(1+2) Direct agreement procedure, National tender. The Employer was allowed to select the contractors of his own choice (1) Requirements on the personal level were merely based on the technical competences ↓ (1) MEAT award criterion: only based on price and quality ↓ (3) The Contractor adheres to the quality management system (3) Focus on the target in terms of the programme mainly due to strict deadlines and fines. (9) A lot of informal communication by means of phone, email, visits etc.	(1) MEAT award criterion was not applied correctly and did not include the technical proposals, as a result it became a lowest price procurement ↓↓ *(11) Disagreement about the interpretation of the D&C contract (i.e. the Employer's role and the design freedom) ↓↓ (5+8) The Employer is quite reluctant to accept claims related to the Employer's Requirements ↓↓ (5+8+x) The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides ↓	(x) Client leadership in promoting the collaborative approach *(1+2) Best value procurement, European tender *(1+2) The Employer was looking for local representation and a Contractor with long-term employees and wanted to meet the project implementation team rather than the marketing team *(1+2) Multiple selection and award criteria from long-term perspective. The organizational culture, the competences and the benevolence were paramount. (8) Mutual trust and co-operation clause in the NEC2 ECC is not effective in itself, but forms a good basis for building trust. The intention of the clause is clear, but it remains open to interpretation and cannot be enforced ↓ (8+x) The Contractor has set up and organized his management team by checking if people are capable and willing to work in	accordance with that 'spirit of mutual trust and co-operation'. It comes down to the individuals involved. (3+6) Focus on the target in terms of the costs and programme mainly due to the pain/gain share mechanism (5+x) Working together and solving problems as a team and challenge each other to achieve the common project objectives *(5) Mutual formal and informal early warnings *(5) Formal and informal early warning meetings *(5) The Project Manager can act impartial and fair by means of help from the Independent Cost Consultant, as he draws up the quotation for CEs *(5+6) Open book regarding the Contractor's cost data *(5+6) CEs are purely for the works, which takes the programme implications out of contention *(9) A lot of informal contact on a day-to-day basis by means of the fulltime co-location	(1) The Contractor took initiative to get the funding together to start up the project (1) Direct negotiations (5+8) The Engineer's dual role (i.e. act reasonable and impartial and on behalf of the Employer) ↓↓ (5+8) There was a general willingness to move the project forward on all sides, but the parties merely performed their obligations under the contract to achieve this, rather than really to collaborate together ↓ (9) A lot of informal communication at all levels on a day-to-day basis by means of the fulltime co-location
Consequences				
(1) The tender team is the same as the project implementation team (3+8) The Contractor is delivering a good product (5) Only informal EWs with no sanctions ↓ (5+9) Informal discussion and agreement prior to sending the formal documents (10) Timely joint problem-solving at the lowest levels	*(3+5+8) The Employer wants a higher quality product than the Contractor is delivering, therefore the Employer often refers to the contract *(5) The Contractor fails to give EWs, whereas the Employer gives many EWs, but these are unwanted ↓	*(8+x) Past co-operations on the other flood schemes and previous joint lessons learned workshops *(8+x) Continuity of staff in all parties (8) By large, all parties understand the meaning of good faith and act in good faith (5) The pain/gain share mechanism has influence on how CEs are viewed. A 'gain' situation allows more freedom for the parties to be a bit more forgiving.	(5+9) Informal discussion and agreement prior to sending the formal documents (10) All problems were resolved by amicable agreement within the Project Team	(3+10) The Employer did not have many resources (e.g. sanctions or incentives) to control the Contractor ↓ (3) The Contractor was delivering a high quality product (8) Both parties had confidence in each other's ability to perform (5) No true collaboration and help to resolve problems, but only informal discussion about claims and the draft determination ↓

On project Forres, a WIN-WIN situation and a clear and aligned client leadership are present. The parties explicitly stated the WIN situation for all parties (i.e. the Employer, the Contractor, the Designer and the Cost Consultant) as a common project objective in the long term. To safeguard this WIN situation, the Employer and the Contractor have negotiated the contract (e.g. the risks, the risk allowances, the target cost and the Contractor's fee) and share the financial risk by means of the pain/gain share mechanism. As a result, the parties are satisfied with their stated WIN situation and the Contractor is focused on turning risks into cost-saving opportunities rather

than on submitting claims. The client leadership promotes a collaborative approach in the long term and has much influence on the project as it encompasses the application of, for example, Best Value Procurement, the NEC3 ECC, the integrated Project Team, the pain/gain share mechanism, the fulltime co-location, and the independent Cost Consultant. Further, the Contractor has set up and organized their management team by checking if people are capable and willing to work in accordance with such integrated Project Team and 'spirit of mutual trust and co-operation'. So far, the collaboration between the parties is very good.

On project Dikkowita, there is mainly a problem with the WIN-WIN situation. The parties negotiated the contract, which implies that there was a WIN-WIN situation at the start of the project. However, at the end of the project, there was most likely no WIN situation for both parties anymore due to the major scope change (i.e. harbour also suitable for large ships) and the disputed bridge-road connection. During the project, the major scope change has partly led to unreasonable, unfair, obstructive and self-defensive behaviour. The client leadership in terms of the parties' roles and responsibilities on the project and their expectations was aligned with during the Project Start Up meeting. The Engineer had full authority to act on behalf of the Employer and all communication with the Contractor was via the Engineer. During the project, the parties merely performed their obligations under the contract and there was no true collaboration and help to resolve problems, but only informal discussion about claims and the draft determination by the Engineer. 90% of the time, the collaboration was good, but 10% of the time the Employer and the Contractor were mainly trying to defend their ground as good as they could due to, for example, unexpected, unjustified or unreasonably priced variations requests and claims.

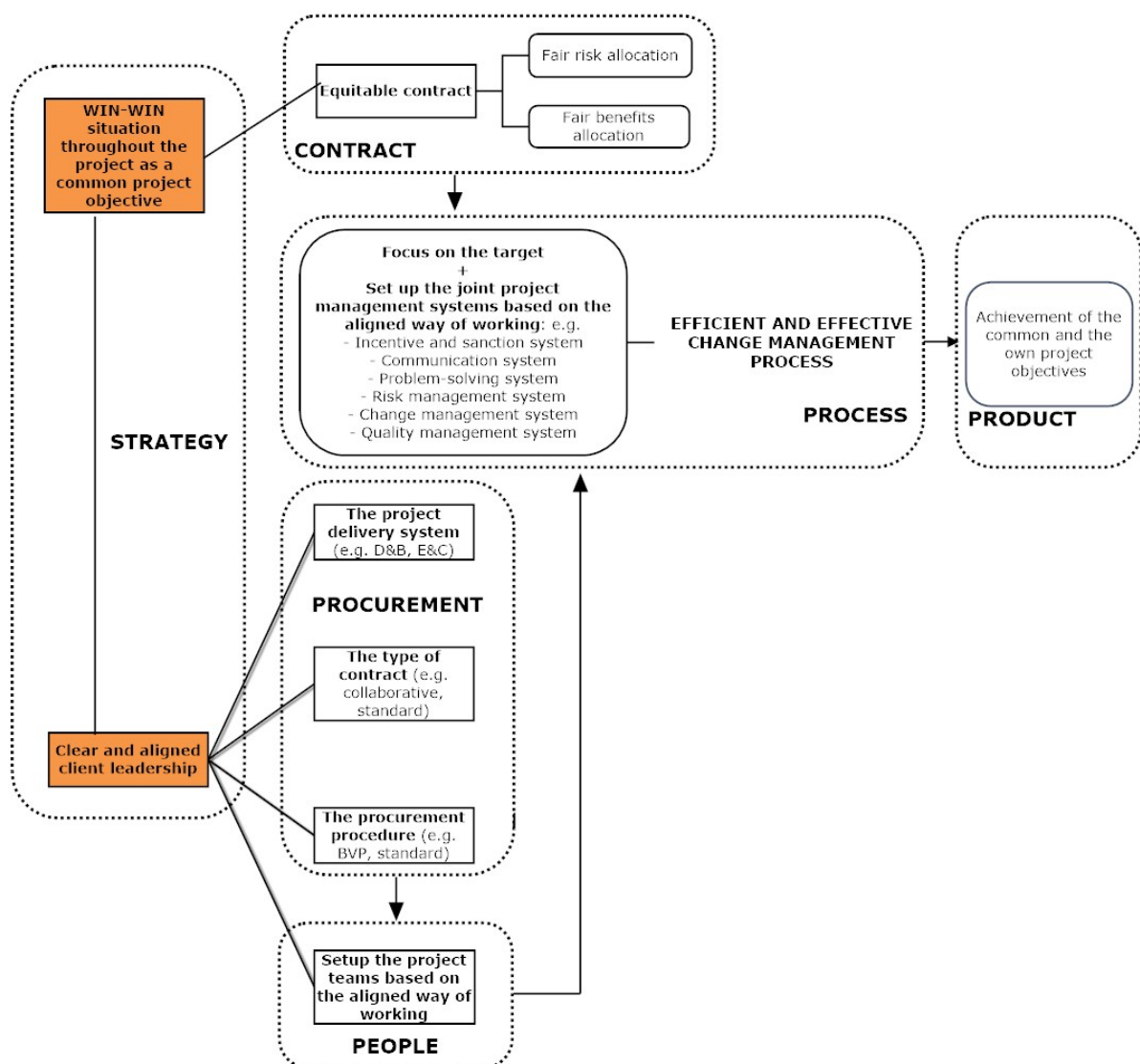


Figure 14: How to create an efficient and effective change management process based on trust

‘A WIN-WIN situation throughout the project’ and ‘a clear and aligned client leadership’ are fundamental because everything else flows and everything else (including the change management process) will not work as efficient and effective without them (Figure 14). The five clusters (procurement, contract, people, process and product) which were used in chapter 7 to analyse the case study projects are also applied here. A new cluster ‘strategy’ was added for the two fundamental trust building aspects. This sub section further discusses the meaning of these two fundamental trust building aspects.

Strategy and Product: WIN-WIN situation throughout the project

Strategy	State ‘a WIN-WIN situation throughout the project’ as a mutual project objective. This objective should be realistic and achievable. The following is paramount in order to achieve this objective: ○ the parties have to create mutual respect and understanding for each other’s interests on the project ○ the parties are satisfied with their established WIN situation - in case of a negotiated contract, the parties can establish a WIN-WIN situation by means of a formal joint goal setting workshop - in case of a non-negotiated contract, the Employer and the Contractor can establish their WIN situation directly by means of the Employer’s Requirements and the tender respectively, but the Employer also has to facilitate a WIN situation for the Contractor during procurement by means of not applying a lowest price procedure and drawing up an equitable contract. ○ the parties safeguard the WIN-WIN situation throughout the project
Product	Clearly state in the Employer’s Requirements what the Employer needs and what ‘fitness for purpose of the works’ means according to them. Create other realistic and achievable mutual project objectives besides ‘fitness for purpose of the works’ and ‘a WIN-WIN situation throughout the project’ which are superior to the parties’ own objectives by means a formalized joint goal setting workshop.

The fitness for purpose requirement in a D&B contract as a mutual project objective is not enough to create trust between the parties and to create focus on the target. The focus will be different due to the contradictory ‘own’ project objectives of the parties. In general, employers want a high quality product against minimum costs, whereas contractors want projects that yield maximum profit with minimum effort. In order to align the focus of both parties it is important to set mutual project objectives which are superior to the parties’ ‘own’ project objectives. From the case study can be concluded that one fundamental mutual project objective on every project is to have ‘a WIN-WIN situation throughout the project’. A WIN-WIN situation means a situation in which collaboration leads to both parties benefitting, so the project has to be commercially viable for both parties. In general, a public client must be accountable to its citizens, therefore the project has to be useful and it has to be constructed within time and budget, and the Contractor must be accountable to its organization, therefore the project has to yield a minimum profit margin at the least.

The establishment of the WIN-WIN situation is different for negotiated and non-negotiated contracts. First, in case of a negotiated contract, the parties can create a WIN-WIN situation by means of a formal joint goal setting workshop in which the parties discuss their ‘own’ project objectives (i.e. what a WIN situation means for them) mainly in terms of quality, time and cost (including profit) and the consequences of them for the other party in order to create mutual respect and understanding for each other’s interests on the project. Subsequently, the parties have to align both WIN situations as they may be contradictory in order to establish a WIN-WIN situation as a mutual project objective. It is important that WIN-WIN situation is realistic and achievable, otherwise the parties will lose focus on the target. The case study shows that it is not necessary to state this mutual project objective explicitly in order to achieve it, but doing so may create more focus and change the parties’ mind-set. Second, in case of a non-negotiated contract (e.g. if procurement law prohibits negotiations), the Employer has to make sure during procurement that the winning tender gets an equitable contract (i.e. fair benefits and risk allocation). The way to achieve this is discussed in the next sub subsection. Further, the Employer can influence their WIN situation (i.e. quality, time and cost) by means of the Employer’s Requirements, whereas the Contractor can influence it by means of their tender.

Overall, it is paramount that the parties create mutual respect and understanding for each other’s interests, that the parties are satisfied with their established WIN situation, and that the parties safeguard the WIN situation for both parties throughout the project. Once the WIN situation gets compromised for one party, that party will start to act unreasonable and unfair (e.g. by being obstructive and issuing unjustified claims) and will lose focus

on the target by doing so. Eventually, this will affect the trust relationship between the parties and the end product.

In both cases (i.e. negotiated and non-negotiated contract), the parties can also use the formal joint goal setting workshop to establish other mutual project objectives in order to align the parties' focus, for example, with respect to safety, sustainability, stakeholder management and future co-operation. Again, it is important that all mutual project objectives are realistic and achievable, otherwise the parties will lose focus on the target. As mentioned above, 'fitness for purpose of the works' is a mutual project objective as well. According to interviewee #2 of project Dikkowita, the fitness for purpose requirement in contracts is always a point of contention between the parties because the Employer and the Engineer use it to argue for a higher standard to be achieved, whereas the Contractor will normally state an item of work is fit for purpose once it functions correctly and meets the Employer's Requirements (ER). He mentions the 'bowl of fruit' metaphor to explain the latter: 'the Employer has asked for a 'bowl of fruit' in the ER and is expecting apples, oranges, grapes, bananas, kiwi fruit, pears, grapefruit, pineapples etc. but only gets one apple, one banana and a pear. Technically it is a 'bowl of fruit', but it is not what the Employer was expecting so they keep pushing for more saying it is not fit for purpose but the Contractor resists saying they have complied with the ER'. The Contractor's team on project Forres indeed state that 'fitness for purpose of the works' is usually quite an onerous thing to achieve. However, all FIDIC experts interviewed state that it is an achievable objective for contractors provided that the Employer has clearly stated in the ER what they need and what 'fitness for purpose' entails for them. FIDIC expert #3 further argues that it often remains contentious though because the likelihood of conflicting requirements increases as the amount of specifications increases.

Contract: Equitable contract

Procurement + Contract	Draw up an equitable contract in terms of allocating the benefits and the risks fairly. The following is paramount in order to achieve this:
	Do not apply a lowest price tender, but use the MEAT award criterion (price and quality) at the least.
	Proportionate the benefits to the parties' effort they are putting into the project (e.g. a proportionate contract price, profit and risk allowance for the Contractor).
	Do not amend the contract unilaterally to the disadvantage of the Contractor, but negotiate the contract or do not make amendments to the standard form of contract at all.
	Allocate the risks to the party best able to manage them in case of a project-specific risk allocation

The case study shows that an equitable contract between the Employer and the Contractor is important, especially for the Contractor. An equitable contract means a fair risk allocation and a fair benefits allocation. The former implies that the risks are allocated to the party best able to manage them and that the risk owner receives an appropriate risk allowance (Meng et al., 2011). The latter implies that the benefits are proportionate to the parties' effort they are putting into the project (Khalfan et al., 2007, p. 389; Wang & Yin, 2013, p. 584). Regarding the Contractor's WIN situation, it is essential that the Employer does not 'put the Contractor in a cage' by means of an unfair contract, otherwise the Contractor will 'behave like an animal'. Three things were derived from the case study which may impair the Contractor's WIN situation this way. First, the contract should not be awarded to the lowest price tender. By doing so anyway, the Contractor has to cut down on, for example their profit margins and risk allowance, in order to win the contract. The Employer should rather apply the MEAT award criterion at the least, which means that the contract should be awarded to the tender with the best price/quality ratio. Second, the Employer should not amend the contract unilaterally to the disadvantage of the Contractor (i.e. a 'like it or lump it' contract). The parties should rather negotiate the contract or make no amendments to the standard form of contract at all. Third, the risks should be allocated to the party best able to manage them. This can be done by, for example, having a joint risk workshop in which the parties identify, discuss and allocate the risks. The risk allocation should be clear and unambiguous. It is not very cost-effective to allocate risks to the Contractor which they cannot manage, because then they can only price them excessively.

Strategy: A clear and aligned client leadership

Strategy	Prior to the procurement of the Contractor, the Employer has to determine the client leadership, which implies creating a clear and detailed vision of how they want to collaborate with the Contractor and how they want to control the project. This client leadership should be used to set up the procurement of the Contractor.
	After the contract award, the Employer and the Contractor have to align the client leadership jointly in order to optimize the collaboration. This aligned client leadership should have a driving influence throughout the project and establish a project culture in which both parties perform to their best abilities.

A clear client leadership means that the client should have a clear vision of how they want to collaborate with the Contractor and how they want to control the project. The Employer has to determine this vision in detail. Things to consider are, for instance, how much design work for the Contractor (e.g. D&B or E&C), how much involvement of the Employer (e.g. what does the Employer's team do and in which processes are they involved to control the project), how much collaboration between the parties and with regard to which aspects (i.e. co-ordination, co-operation, collaboration or integration), how to control the costs and how to manage the risks. Once the Employer has clearly defined the client leadership, they should use it to set up the procurement of the Contractor. The procurement is discussed in the next sub subsection. After the contract award, the parties have to align the client leadership jointly in order to optimize the collaboration. This aligned client leadership should have a driving influence throughout the project and establish a project culture in which both parties perform to their best abilities. Therefore, the project teams and the project management systems and approaches have to be set up in accordance with the aligned client leadership. The client leadership is project-specific and can take on any form, but as long as it is clear and fully aligned with the Contractor, it should form a good basis for the collaboration because it would be much easier to achieve a certain objective if both parties work in unison.

Procurement: Selection of the right contractor

Procurement + People	The following is paramount in order to select the right Contractor:
	Apply the right project delivery system (e.g. D&B or E&C)
	Apply the right type of contract (e.g. standard or collaborative)
	Apply the right procurement procedure (e.g. standard, BVP or competitive dialogue): one in which the Employer can assess which Contractor is best able to perform the job and falls in line with the Employer's desired way of working the best.
	Apply the right award criteria: always apply the MEAT award criterion (i.e. price and quality) at least instead of going for the lowest price tender.
	Assess whether the Contractor has the right people to perform the job: request CV's of key people of the project implementation team, talk to referees and involve these key people in the tender phase

The Employer has to find the right Contractor who is able and willing to work in accordance with the Employer's desired way of working by applying the right project delivery system (e.g. D&B or E&C), the right type of contract (e.g. standard or collaborative), the right procurement procedure (e.g. standard, BVP or competitive dialogue) and the right award criteria. The Employer should always apply the MEAT award criterion (i.e. price and quality) at the least instead of going for the lowest price tender. Dependent on the Employer's requirements regarding their desired way of working, the Employer may also apply multiple award criteria in order to make a better assessment of the tenderers. In order to check whether the Contractor has the right people to perform the job, the Employer should request CV's of the Contractor's key people (i.e. the project implementation representatives and team leaders), talk to referees and involve these key people in the tender phase (e.g. by means of interviews or site visits) as part of the assessment. In general, the goal is to find the best match between the client leadership and the Employer's Requirements, and the Contractor's trustworthiness to perform the job (i.e. ability (e.g. technical, financial and project management), benevolence, integrity, and predictability or reliability (the latter three by means of the organizational culture, e.g. how people relate to each other, what is the power distance in the organization and how are people enabled, does everyone in the organization speak with the same view)). The best match is the Contractor who is best able to perform the job and who falls in line with the Employer's desired way of working the best (i.e. who would be the easiest for the Employer to work with).

People: Selection of the right people

People	The aligned client leadership should clearly state the way of working in terms of both parties' roles and responsibilities, the expectations of both parties, and what reasonable and fair behaviour implies on the project (by means of examples).
	Select the right people: the Employer's and the Contractor's team consists of people who are able and willing to work in accordance with the aligned client leadership.
	Act reasonable and fair towards the other party at all levels between the project teams and throughout the project.
	Oblige a party to request the other party's approval for replacements of the key people (i.e. the representatives and team leaders) in their project team.
	Allow both parties to request the other party to remove an employee from the project in case he is not acting in accordance with the aligned client leadership.

The aligned client leadership should clearly state the way of working in terms of both parties' roles and responsibilities, the expectations of both parties, and what reasonable and fair behaviour implies on the project (by means of examples). The people on the Employer's and the Contractor's team should be able and willing to work in that manner. In general, the goal is to find the right people for the right job at the right time. The Employer's and the Contractor's key people (i.e. the representatives and team leaders) have an important role here with regard to setting up and organizing their teams, leading by example and encouraging their teams. Reasonable and fair behaviour of both parties is paramount at all levels between the project teams and throughout the project. Both teams should remain the same throughout the project, but it may be useful to oblige a party to request the other party's approval for replacements of the key people in their project team and to allow both parties to request the other party to remove an employee from the project in case he is not acting in accordance with the aligned client leadership.

Other trust building and efficiency and effectiveness creating aspects

Process: Set up and align the joint project management systems

Process	Jointly setup the project management systems and approaches in accordance with the aligned client leadership. The parties should streamline and tailor them to the project, which also applies to existing project management systems in the standard form of contract. Examples of essential standard project management systems are given below and examples of improvements to these systems are given between brackets.
	○ A clearly defined incentive and sanction system, can only be aligned in case of a negotiated contract (incentives, such as bonuses and a pain/gain share mechanism are more effective than sanctions to create focus on the target in terms of costs and programme, but they have to be proportionate to the contract price)
	○ A clearly defined formal communication system (in case of a communication overload, prioritize communication and/or agree on the submission dates beforehand) ○ A clearly defined informal communication system (informal communication at all levels between the project teams, preferably on a day-to-day basis by means of a fulltime co-location)
	○ A clearly defined risk management system and roles therein (joint risk workshop to identify, discuss and allocate project-specific risks fairly, align the risk management approach between the parties, separate joint risk review meetings, manage the Employer's risks jointly) ○ A clearly defined problem-solving system (align the extent to which the parties collaborate and help each other and with regard to which aspects to resolve problems, formal and informal mutual early warning for risks, formal and informal early warning meeting, define the escalation model jointly) ○ A clearly defined claims system (open book regarding the Contractor's cost data, involve an independent cost consultant to draw up the quotation, only include the direct costs of the works in the claim and reimburse the indirect costs separately)
	○ A clearly defined change management system and roles therein (quick informal decision-making in case it is beneficial to both parties that the variation is implemented prior to the paperwork, align the change management approach between the parties, open book regarding the Contractor's cost data, involve an independent cost consultant to draw up the quotation, only include the direct costs of the works in the claim and reimburse the indirect costs separately, mutual early warning for variations due to risks and ambiguities in contract documents, separate formal variations meeting, jointly discuss potential variations prior to the formal procedure)
	○ A clearly defined relationship management system (fulltime co-location, informal or social events, Project Follow Up workshops, team building workshops, interventions by the parties' Project Directors)
	○ A clearly defined quality management system (take into account variations due to uncorrectable deviations)

The parties also have to setup the joint project management systems and approaches in accordance with the aligned client leadership. Most employers and contractor have standard Project Management Plans which they often re-use and tailor to each project. Therefore, it is not useful to discuss how the standard project management systems and tools should work. The focus of the sub section is rather on improvements to those standard project management systems and tools which were proven to be effective on the case study projects

to build trust or to create an efficient and effective change management process. In general, the project management systems and tools including these improvements will only work efficiently and effectively if there is a WIN-WIN situation and if they are jointly agreed and adjusted to the aligned client leadership. For example, if the parties did not clearly define what the Early Warning encompasses, then there may be many unjustified Early Warnings or if the parties did not agree on the mutual Early Warning obligation, the Contractor may not take the Employer's EW into account. Some of these systems and tools may already be included in certain standard forms of contract, but it is always important that the parties jointly streamline and tailor them to the project. The latter also applies to the systems and tools described in this sub section.

Clearly defined incentive and sanction system

Focus on the target in terms of costs and programme can be promoted by means of incentives and sanctions. Incentives, such as bonuses or a pain/gain share mechanism, are more effective than sanctions, but they have to be proportionate to the contract price. A pain/gain share mechanism, like in the NEC3 ECC, can be applied to share the financial risk between the parties. The pain/gain share mechanism works as follows (Figure 15). The parties agree on the target cost, the share percentages and the share range. The target cost consists of the base cost (the direct costs of the works in the form of labour, plant and materials), the fee (the overheads and profit), and the Contractor's risk allowance (EC Harris, 2011).

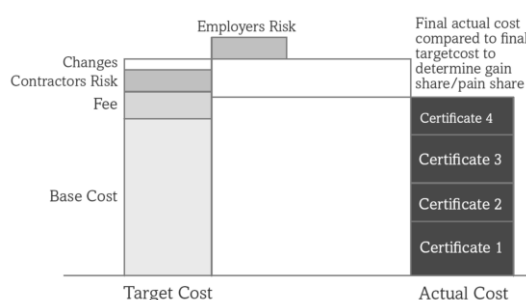


Figure 15: Pain/gain share mechanism (EC Harris, 2011)

During the project, the Project Manager has access to the Contractor's accounts and records (i.e. open book) and the Contractor will be paid on a cost reimbursable (actual cost) basis for the work undertaken. If the Employer's risks materialize, they will become CE's and will be added to the target cost. Any other variations will also be added to the target cost. If the Employer's risk allowance is not used, the cost savings will only be for the Employer. The Contractor can create a gain share by means of cost savings in their own risk allowance (e.g. due to good risk management or if the risks do not materialize). It is important that the parties understand that if the risk allowances are needed to be used, they should be used. At the end of the project, the final target cost will be compared to the actual cost (EC Harris, 2011). The share percentages and share range can, for example, be as follows:

Table 74: Example of share percentages and range in a pain/gain share mechanism

Share range	Contractor's share percentage
Less than 90%	100%
From 90% to 110%	50%
Greater than 110%	100%

In this example, if the actual cost is less than 90% of the final target cost, then the Contractor receives 100% of the cost savings (i.e. the gain share). If the actual cost is from 90% to 110% of the final target cost, then the parties share the pain or gain share 50/50. If the actual cost is greater than 110% of the final target cost (e.g. due to underestimated prices), then the Contractor has to pay 100% of the cost overruns (i.e. the pain share).

The Forres project has proven that the pain/gain share mechanism works well to promote the partnership (e.g. align objectives and culture of trust, co-operation and working together) in order to reduce the costs for

everyone. Such mechanism creates an ethos where you really need to work closely together to achieve the common objectives so that you could save on the programme and costs in order to create a gain share. Further, the pain/gain share mechanism prevents the Contractor to gain at the Employer's expense (i.e. benefit from their risks) and vice versa, and encourages value engineering (innovation and efficiency) by the Contractor so that both parties could gain from that. The latter works very well as the Contractor is focused on turning risks into cost-saving opportunities. Such focus contributed to the current 'gain' situation.

Clearly defined communication system

The communication system should be aligned between the parties and include things like the meeting schedule, the standard forms and registers, the document flows, the document management system (DMS), and file naming. A fixed period of reply in combination with a deemed acceptance in case one fails to reply on time may contravene the principle of good faith. On the one hand, it does encourage the parties to be on top of the communication requirements and the parties should try to stick to it as much as possible. On the other hand, in some cases it is important that the parties take into account the principle of reasonableness and fairness with regard to the period of reply and deemed acceptance, and not to misuse the deemed acceptance, because some things just require more time to reply to or sometimes the workload is just too high. In such cases, it may be more relevant to recognize the importance of communication rather than the importance of the period of reply. It helps if the parties prioritize communication (e.g. by means of a priority list) and if they make a planning in which they indicate the submission dates.

The parties should have a lot of informal communication at all levels, preferably on a day-to-day basis by means of a fulltime co-location. The fulltime co-location instigates the parties to visit each other and to have face-to-face informal meetings to discuss matters instead of communicating by emails and phone calls. The fulltime co-location also helps to improve the relationship between the parties informally on a day-to-day basis, because there will be joint facilities where people can chat over coffee or lunch.

Clearly defined risk management system and roles therein

As mentioned above, the risks should be allocated to the party best able to manage them, which can be done by, for example, having a joint risk workshop in which the parties identify, discuss and allocate the risks. The risk management system should be aligned between the parties and include things like the roles and responsibilities, the setup and use of a risk register, the analysis of risks, and the risk meetings. Usually, the Employer and the Contractor are responsible for managing their own risks, then the risk meetings are used to align the two risk registers. The parties may also jointly manage the Employer's risks, like they did on the Forres project, but there has to be an incentive for the Contractor to do so. On the Forres project, risk management is closely related to the pain/gain share mechanism and the target cost. Risk review meetings are attended by the whole Project Team and are held to monitor risk mitigation actions, to identify opportunities, to plan for future risks, to record actions and to update the register and to predict the costs to complete. The incentive for all parties is that it is really important that the parties manage the time and the costs of the project due to their reputations. Their reputations have enhanced because the parties have been able to predict where they are going.

Further, it is essential to align the risk management approach (e.g. on a 5-point scale from entirely reactive to entirely proactive) between the parties, otherwise there will be disagreements about, for instance, which risks to consider, which quantification to assign to them and when to take mitigation measures. As a result, the alignment of the risk registers or the joint risk management will not be fully effective. Preferably, this aligned risk management approach is quite proactive, otherwise risk management is not fully effective either. Not only does effective risk management lead to trust between the parties, but it may also lead to early identification of variations as it is closely related to change management. There are several reasons for the latter. First, if there is a risk and it materializes, then a variation may be necessary to resolve the problem. Second, a risk mitigation measure may comprise a variation, but it depends on the effect of the variation whether it will be implemented or not. The effect of the variation (i.e. the reduction of the risk) has to be bigger than the cost of the variation. Third, variations may have an influence on the risk probability or impact of other elements.

Clearly defined problem-solving system

A problem can be defined as ‘a perceived gap between the existing state and a desired state, or a deviation from a norm, standard, or status quo’ (BusinessDictionary.com, 2014). Thus, problems which may occur in construction projects are, for example, different geotechnical conditions than expected, non-compliance with the Employer’s requirements, and delay in construction. Such problems need to be resolved in order to achieve the common project objectives. The parties should align the extent to which they collaborate and help each other and with regard to which aspects to resolve problems (e.g. confrontation and no support for the weaker, limited co-operation and support only with the issues related to self-interest, collaboration and often support for the weak party, or close collaboration and always support for the weak party (Meng et al., 2011)). This problem-solving philosophy is closely related to the risk management system and approach, but it also depends on the expertise of the Employer’s team. The parties should always try to resolve all problems by amicable agreement. There are several tools to do so, which are discussed below.

Mutual formal and informal early warning

The NEC3 ECC contains a mutual Early Warning obligation for risks. The FIDIC YB seems to lay down such EW obligation for the Contractor in §8.3, but it is not very effective without a sanction or incentive. The UAC-IC 2005 does not have EW obligations for risks. The EW sub clause in the NEC3 ECC reads as follows:

§16.1. ‘The Contractor and the Project Manager give an early warning by notifying the other **as soon as either becomes aware of any matter** which could increase the total of the Prices, delay Completion, delay meeting a Key Date or impair the performance of the works in use. The Contractor may give an early warning by notifying the Project Manager of any other matter which could increase his total cost. The Project Manager enters early warning matters in the Risk Register. Early warning of a matter for which a compensation event has previously been notified is not required’.

The meaning of this EW clause is quite clear, but the ‘aware’ part and the ‘any matter’ part are open to interpretation. On the one hand, the ‘aware’ part is a great thing, because as soon as you know it, you go around the table to talk about it and try to prevent it from becoming anything. If you wait any longer, the likelihood that it becomes something becomes bigger. So the effect is that you give yourself and others more time to deal with it. On the other hand, it is closely related to trust, since you must trust each other that you are actually going to raise an EW as soon as you become aware. Therefore, the ‘aware’ part has to be aligned with what is reasonable and fair on the project. The ‘any matter’ part also has to be defined by the parties, otherwise the parties will receive many unimportant EWs. For example, on the Forres project, the Project Manager took the decision in the early stages that the parties were not going to follow that EW clause. The Project Manager did not want to be swamped with EWs telling her things she already knew. If the Project Manager issues an instruction, she already know it is going to have a cost impact, otherwise she would not have issued it. So she does not want an immediate reply from the Contractor in the form of an EW saying it will affect the costs. Following this clause would lead to hundreds of EWs and it will affect the Project Manager’s focus on the important things.

§63.5 deals with the sanction for if the Contractor did not give an early warning, the Contractor is liable for the lost cost and time savings which the parties could have gained due to the early warning. The interviewees of the Forres project showed that this sanction is not very helpful because then the Contractor will issue an EW for every single little thing. There will be so many EWs that the EW loses its effect and that the Project Manager cannot distinguish the ones for severe problems from the ones which are purely for administration. Therefore, two things are essential to be agreed upon. First, the parties have to agree on what the definition of a formal and an informal EW is. The mutual EW obligation will only work effectively if the parties want it to be working like that. For example, on the Forres project, the parties agreed to discuss matters first to decide whether it is an EW and whether it has an implication, and that a formal EW will only be issued for serious things, so if it meant that the parties need to get together and talk in order to continue how the parties wanted to. Second, the Contractor should have an incentive for giving an EW. For example, on the Forres project, such incentive is created by means of the pain/gain share mechanism.

Formal and informal early warning meeting

§16.2 and §16.3 in the NEC3 ECC deal with the early warning meeting after an EW is given and read as follows:

§16.2. 'Either the Project Manager or the Contractor may instruct the other to attend a risk reduction meeting. Each may instruct other people to attend if the other agrees'.

§16.3. 'At a risk reduction meeting, those who attend co-operate in making and considering proposals for how the effect of the registered risks can be avoided or reduced, seeking solutions that will bring advantage to all those who will be affected, deciding on the actions which will be taken and who, in accordance with this contract, will take them and deciding which risks have now been avoided or have passed and can be removed from the Risk Register'.

So the EW instigates the parties to have a meeting to discuss what the problem is and how to deal with it, and if the risk cannot be mitigated, they can use the risk allowance. On the Forres project, such EW meetings are usually informal. Formal EW meetings are often not needed because the parties highlight the changes and the circumstances which need to be addressed regularly and mostly the parties are able to agree to an action and to a CE since most solutions are obvious. In general, it is more efficient to have informal discussion and an agreement prior to sending the formal documents.

Clearly defined escalation model

The parties have to create one escalation model together. This means that the parties have to define and agree on the roles and responsibilities (i.e. the mandate regulations) for every escalation level. The mandate regulations have to be proportionate to the contract value though, otherwise all problems can only be resolved at the highest level. The escalation model can only work optimally if the people on the project adhere to it. Problems have to be resolved at the right level, which implies that people at the lowest level just have to identify the problems and escalate them to the right level, rather than discussing them first.

Clearly defined claims system

The claims procedure should be clearly defined. All three standard forms of contract researched here contain a claims procedure. In the NEC3 ECC and the FIDIC YB, the procedure is quite extensive, whereas in the UAC-IC 2005 it is quite short. The case study shows that certain things may be applied to speed up the negotiations about the quotation of the claim. First, involve an independent cost consultant. The Project Manager's/Engineer's dual role (i.e. as the Employer's agent and as a certifier) on NEC3 ECC and FIDIC YB projects may cause inefficient negotiations as he may be accused by either party of not drawing up a fair quotation. This problem can be resolved by involving an independent cost consultant to draw up the quotation and discuss it with the Contractor. The cost consultant is paid by the Employer, but has to act independent due to, for example, a code of conduct. If the latter does not apply, it is better to jointly pay the cost consultant to ensure his independency. The Project Manager/Engineer acts on the advice of the cost consultant and has to sign off the quotation. If the Employer's agent does not have to draw up the quotation, like on UAC-IC 2005 projects, the involvement of a jointly paid cost consultant may still speed up the negotiations. Second, open book regarding the Contractor's cost data. If the Employer has full access to the Contractor's cost data, they will need much less time to check the substantiation of the claims in terms of the costs. The NEC3 ECC is an open book contract if Main Option C, D, E or F is chosen. Pursuant to §52.3, the Project Manager is allowed to check the Contractor's accounts and records at any time. On the Forres project, the target cost and CEs are closely monitored by the Employer's team and all unreasonable CEs will be challenged openly by the Cost Consultant. The open book contract works well and creates trust in what the Contractor is submitting. Further, the Contractor produces daily and weekly record sheets, which are checked and signed off by the Employer's Site Supervisor. So the CEs are checked on a couple of levels. Third, not taking the programme implications into account in the claim. A problem which causes an inefficient claims procedure is that the parties do not have insight into the full impact of the claim. For example, on the Dikkowita project, the timelines tended to drift after notification of the claim, because the Contractor always sought to extend the process until they have a better idea of the full impact of the claim rather than to try and move things forward. On the Forres project, the Employer recognized this problem and resolved it by only including the direct costs of the works in the claim and reimburse the indirect costs (e.g. extra costs for running the site) separately. This decision takes the programme implications out of contention, which according to the interviewees has been very successful on the project.

Clearly defined change management system and roles therein

All three standard forms of contract researched here contain a variations procedure. In the NEC3 ECC, the procedure is quite extensive, whereas in the UAC-IC 2005 and the FIDIC YB, it is quite short. It is always important that the parties jointly streamline and tailor the variations procedure to the project. The case study has shown that sometimes, in order to continue the works and to keep things moving forward, it may be necessary to deviate from the procedure and to implement the variation prior to the paper work. Such deviations require quick decision-making and trust in each other that the paperwork will tidy itself up as agreed (i.e. the Employer will pay for the variation and the Contractor will not claim higher costs than agreed upon) later. The change management system should include things like the variations procedure, the roles and responsibilities in both teams, the type of variations to consider, the use a standard form and a register for variations (to create a basic audit trail) and the formal or informal variations meeting.

Further, it is essential to align the change management approach (e.g. on a 5-point scale from entirely reactive to entirely proactive) between the parties, otherwise there will be disagreements about, for instance, with regard to late notifications of potential variations and slow decision-making about variations. Preferably, the aligned change management approach is quite proactive. A mutual formal and informal early warning obligation for variations due to risks and errors in documents promotes a proactive approach. The change management system of Chapter 4 (sub question 2) was reviewed and commented by means of the case study findings:

Table 75: Reviewed list of change management components for D&B projects

Principle	Component
1. Anticipate change	- Align the risk management and the change management objectives (i.e. procedures and approaches) It is not possible to have an objective like 'minimize the number of variations', because variations are necessary scope changes in order to achieve the project result and arise if the contract does not cover the aspect or contains errors, or if the Employer requests them. Other objectives which are possible are for example: 'variations regarding the design kept to a minimum other than to accommodate exceptional or unforeseen events or cost saving opportunities' and 'there must be an agreement between the Employer and the Contractor). - Clearly defined and aligned change management procedure and processes and roles and responsibilities therein and agree on the type of changes to consider. - Agree on project philosophy with regard to risk allocation - Prior identification of areas where variations likely occur (e.g. by risk management and quality management)
2. Recognize change	- Early identification and notification of a potential variation by the Employer or the Contractor A mutual formal and informal early warning obligation for variations due to risks and errors in documents may promote that. - Discuss the potential variation informally with the other party prior to the formal procedure - The Contractor assesses the potential impact and creates a proposed change order - The Contractor documents the proposed variation in the variations register
3. Evaluate change	- The Contractor determines the priority of the proposed variation by means of the impact and categorizes it - The Contractor discusses the proposed variation (technical part) and its impact (financial part) with the Employer Usually, there is only one change option. There are only multiple change options in case of big variations. (Prompt) decision making as to whether to accept/reject the variation by the Employer Things which may speed up the negotiations about the quotation are to hire an independent cost consultant to draw up the quotation, open book regarding the Contractor's cost data, and only include the direct costs of the works in the quotation and reimburse the indirect costs (i.e. the programme implications) separately. The former two are helpful because the parties often disagree on the price of the variation, whereas the latter is helpful because the parties often have no insight into the full impact of the variation. These three things were elaborated in the previous sub section under 'clearly defined claims system'.
4. Resolve change	Both parties communicate the final change decision to all team members whose work is affected by it
5. Monitor implementation	The Contractor monitors and records the implementation of the variation (on the construction site and in the QMS)
6. Learn from change	- Conduct a review and create lessons learned from the big or remarkable variations only - Update databases and incorporate lessons learned for organization The case study shows that it may only be useful to the Employer to create lessons learned from big or remarkable variations and to share this knowledge within the organization as most variations stem from 'gaps' in the contract.

Clearly defined relationship management system

The best system for continuous improvement of the relationship is fulltime co-location of the Employer's team and the Contractor's team. The relationship will improve informally on a day-to-day basis, because there will be joint facilities where people can chat over coffee or lunch (i.e. emotional investments). Informal or social events, such as a Christmas lunch, birthdays or dinner at a restaurant, also help to improve the relationship. If there are relationship-based problems, it is important to resolve them timely. For example, the Project Directors of both parties may intervene or the parties may organize formal Project Follow Up (PFU) or team building workshops. The interventions and workshops will only be effective if they are needed, if the party want them to be effective and if the parties are willing to give in to resolve the problems.

Clearly defined quality management system

Some interviewees mention the quality management system as many variations arise in the verification process. If the Contractor cannot verify a requirement as it is stated in the ER, for example, because the quality is lower, then it is a deviation. If the deviation cannot be corrected, a variation to the contract becomes necessary to verify the requirement. This research did not take into account the quality management system as a source of variations, but it is certainly something which the parties, especially the Contractor, should be taken into account on D&B projects. For example, on project Drachtsterweg, the Contractor creates lessons learned from deviations.

9. Discussion

9.1 Validity of the research

The validity of the research design was evaluated by means of the criteria construct validity, internal validity, external validity and reliability (Yin, 2009, pp. 40-45).

Construct validity (see also sub section 7.1)

When conducting the case study, multiple data sources were used to establish construct validity. First, the standard forms of contract and the project records were studied to draw up the interview questions. Second, semi-structured interviews and surveys were held to confirm what was on paper and to gather additional information. Third, for each case study project, there were multiple interviewees from both the Employer's team and the Contractor's team. For the Dikkowita project, there were only two interviewees from the Employer's team since another key project team member did not have time for the interview and because the author was not allowed to reach out to the Contractor's team due to the 'sensitive' claims at the end of the project. The triangulation problem for this project was partly resolved by means of the semi-structured surveys which were filled out by five FIDIC experts. Fourth, for all projects, except Dikkowita, the author spent a lot of time at the offices or was invited to join a meeting, which gave an impression of the project cultures. Further, a chain of evidence was created in this report by including the main findings from the project records and the interviews in chapter 7 and the entire case study database in the appendix. All interviewees were numbered so that the statements can be checked in the case study database. The case study database is discussed under sub section 'reliability'.

Internal validity (see also sub sections 7.1 and 8.1)

The general analytic strategy which was used in this research is 'relying on theoretical propositions' (Yin, 2009, pp. 130-131). The proposition of this research is stated in sub section 1.3 and is as follows: *The inefficiency and the ineffectiveness of the change management process on D&B projects is mainly caused by distrust between the client and the contractor.* To ensure internal validity analytic tactics were used in the data analysis. The following analytic tactics by (Miles et al., 2013, pp. 278-284) were applied to assess the case study projects: 'counting' to compare and summarize the interview answers per project, 'clustering' to describe the most decisive aspects per project, and 'seeing plausibility' to derive the direct and the indirect links between trust and change management process from the empirical data per project. In the comparative analysis, some analytic tactics by (Miles et al., 2013, pp. 277-284) were applied as well: 'making contrasts/comparisons' and 'counting' to draw conclusions regarding the influence of trust on the change management process, 'clustering', 'making contrasts/comparisons', 'counting' and 'noting patterns' to find the fundamental trust building aspects, and 'making contrasts/comparisons' and 'counting' to find effective trust building and efficiency and effectiveness creating aspects.

External validity (see also sub section 7.1)

In order to safeguard the external validity, the replication logic was followed for the case study projects. First, the case study projects were chosen with care by means of applying selection criteria. The common characteristics of the case study projects are: an integrated contract, D&B/E&C, medium-large-sized infrastructure project (except for Bijlmerweide, which is extra-small-sized), and a public client. Further, project-specific characteristics such as culture, strategic partnering, and traditional leadership were taken into account. Second, the questionnaires were drawn up with care as well so that the data collected from the projects could be compared. As there were four different projects it was not possible to use one single questionnaire, so four different questionnaires were drawn up, but each followed the same structure and included the same type of questions. This structure is based on the two assessment models of chapter 5. Due to the replication logic, it is quite safe to state that the findings of the comparative analysis (chapter 8) are applicable to medium-large-sized D&B/E&C infrastructure projects with public clients using an integrated contract.

Reliability (see also sub section 7.1)

The interview protocol in chapter 7 and the case study database in the appendix were created to ensure the reliability of the research. The protocol describes all steps that were taken from the preparation phase to the validation phase. The case study database consists of the interviewees list, an example of an interview agenda, the interview questionnaires, the interview reports and the summary of the interview reports per project. Each interview report summarizes the most important answers given per criteria and includes details such as the interviewee's name and the date, time and place of the interview. The reports were sent back to the interviewees for them to check, to adjust and to approve it. About half of all reports were validated, none of the interviewees had many comments. The comments were mainly aimed at the ambiguities or errors in the report. The other half of the reports were deemed to be accepted because the interviewees did not reply within time.

9.2 Scientific contribution

With this research, the literature gap stated in sub section 1.2 has become smaller, but more research is still needed though to close that gap.

- First, knowledge was gained about trust building on non-partnering D&B projects (chapter 7 and 8), one of the case study projects (Forres) was part of a programme carried out by a strategic partnership, which made it possible to spot the differences between trust building on partnering and non-partnering projects. The ways to build trust are more or less the same on both type of projects, but on partnering projects the parties may find the procurement phase much more important, since they have to work closely with the partner. Other trust building aspects which seem to be more important on partnering projects are joint problem-solving as a team, joint goal setting (i.e. long-term partnering objectives such as a WIN-WIN situation for all parties) and continuous improvement (e.g. by means of lessons learned).
- Second, with respect to the knowledge about change management specifically for D&B projects, the generic change management system of Chapter 4 was reviewed and discussed in the previous chapter. Further, some essential differences between variations on DBB projects and on D&B projects were identified. On D&B projects, the Contractor's main focus seems to be on the 'gaps' in the contract as many variations stem from such gaps. The Employer does not initiate many variations, most variations are issued by the Contractor. Due to the 'gaps', the variations are usually quite small and do not require multiple change options to be discussed between the parties, and learning from such variations is only useful for the Employer and if the variations are big or remarkable. Further, risk management does not seem to be closely related to change management on 3 out of the 4 case study projects. Risk management is not used to identify areas where changes are likely to occur. On D&B projects, a great source of variations is the quality management system. Many variations stem from uncorrectable deviations.
- Third, this research has demonstrated that trust between the parties has much influence on the efficiency and the effectiveness of the change management process (chapter 8). Independent of the type of project (partnering or non-partnering), the two fundamental trust building aspects 'a WIN-WIN situation throughout the project' and 'a clear and aligned client leadership' have to be in place to achieve an efficient and effective change management process. A quick assessment was performed on the basis of the findings of chapter 8 to check the amount of trust which is needed at the least in order to achieve such change management process without entering into a complete partnership. That trust level is about 2.5 out of 4, which implies a confident to high trust level between the parties.
- Fourth, knowledge about the three standard forms of contract was gained in terms of how much these contracts facilitate trust and change management (chapter 6) and how effective these contracts are in doing that (chapter 7). The NEC3 ECC seems to be more facilitating and effective compared to the other two contracts, because it contains project management tools and risk management clauses as well.

9.3 Limitations of the research

Every research has its limitations. Only those limitations which had the greatest potential impact on the quality of the findings and the author's ability to answer the research questions are discussed in this sub section.

- First, the number of case study projects was limited as there was one case study project for each standard form of contract. This limitation may have had an influence on the quality of the findings due to the project-specific characteristics. The reason for the limited number of case study projects is simple, the time given to conduct this research was limited as well. Therefore, the author had applied selection criteria in order to ensure that the selected case study projects were comparable. The limitation could be overcome in the future by allowing more time for the research in order to increase the number of case study projects.
- Second, the choice of potential case study projects was limited, which also may have had an influence on the quality of the findings due to, for example, limited data collection and the influence of other factors. The research was conducted within the company Royal HaskoningDHV in Amsterdam using their resources and their projects. The choice of case study projects was very dependent on the company's portfolio and the live projects the company was working on at that time. The consequences were that the author had to select the Forres project, even though it is an NEC2 ECC project which includes strategic partnering and an E&C contract, and the Dikkowita project, even though the number of interviewees was limited and they were only from the Employer's team (the latter was the main condition for the FIDIC Engineer's co-operation). In the future, this limitation could be overcome by selecting projects from multiple companies.
- Third, the assessment models which form the basis of the research were based on literature about trust building in general in construction projects and in partnering projects, and about generic change management systems in construction projects. This limitation may have had an influence on the quality of the findings since the criteria for trust and change management may be different for non-partnering D&B projects. The reason for the limitation is the gap in literature with regard to trust building in non-partnering projects and change management on D&B projects. Therefore the author decided to create the assessment models on the basis of the existing literature. Overall, the assessment models worked quite well as the average scores represent the actual trust levels quite well, but the change management levels are less accurate. There are some things in the assessment model which could be improved. First, the assessment models need to be reviewed. The trust components for 'continuous improvement' (7+11) and the change management components for 'learning from changes' (5+6) do not seem very important on non-partnering D&B projects. Further, risk management has a lot of influence on the change management level, but it does not seem to be closely related to change management, which partly caused the inaccurate change management levels. Quality management should be added to the change management assessment model as many variations arise in the verification process. Second, the maturity models need to be extended, since there were many trust building and efficiency and effectiveness creating aspects identified which were not covered in the models. Third, the maturity models need to be reviewed, since some aspects indicated as 'building distrust' or 'creating inefficiency and ineffectiveness' (e.g. continuous improvement and risk sharing) do not necessarily lead to distrust or inefficiency and ineffectiveness, in such cases it means that the requirements on the project for those components are limited and do not really deserve a low score. The same applies when there are no requirements at all. Then, the component will get score 0, which of course has influence on the total trust and change management level. In the future, this limitation could be overcome by conducting interviews with people who have experience in working in non-partnering D&B projects to verify the assessment models and taking into account the improvements described above.
- Fourth, this research is restricted to construction project management and construction contract law. The research has shown that contract law and procurement law overlap when it comes to trust building between the parties, but procurement law was not fully taken into account, which means that the findings are not aligned with procurement law and may even contravene it. The reason for this limitation is that it was advised to focus on either contract law or procurement law, not on both because they encompass two different things. In addition, the time given to conduct this research was limited as well. To a certain extent, procurement law was taken into account though with respect to the two Dutch case study projects. The limitation could be overcome in the future by allowing more time for the research in order to study the requirements regarding procurement law as well.

V. Conclusions and recommendations

10 Conclusions and recommendations

10. Conclusions and recommendations

10.1 Conclusions

The objective of this research project is to determine to what extent mutual trust between the client and the contractor influences the efficiency and the effectiveness of the change management process in complex D&B infrastructure projects in order to provide recommendations for building mutual trust on such projects in the Netherlands which could be added to the UAC-IC 2005 in the form of an annex. A main research question (RQ) and six sub questions (SQ) were stated, and a literature survey and a comparative case study were conducted to achieve that objective. The research design is as follows: the literature survey on mutual trust between the client and the contractor (SQ1) and on efficient and effective change management (SQ2) based on the consultation of relevant literature yielded the assessment criteria and the assessment models for trust and change management (SQ3), by means of which the UAC-IC 2005, NEC3 ECC and FIDIC yellow book were evaluated based on the consultation of the standard forms of contract and relevant literature (SQ4). Subsequently, based on these assessments a case study of a complex D&B project was conducted for each standard form of construction contract (there were two projects for the UAC-IC 2005) by means of project records studies and face-to-face interviews (SQ5) to validate the effectiveness of the contract clauses found in SQ4 in practice and to identify other trust building and efficiency and effectiveness creating aspects. A comparison of the results of these case studies concluded with determining the influence of mutual trust between the client and the contractor on the efficiency and the effectiveness of the change management process in complex D&B infrastructure projects, and with providing recommendations in terms of this aspect (SQ6). The answer to the main research question is generalized from the answer to SQ6, but the recommendations are for the UAC-IC 2005 specifically. All research questions are answered below, starting with the sub questions.

SQ1. Which aspects are necessary according to theories on trust in order to achieve mutual trust between the client and the contractor on complex D&B infrastructure projects?

The table below summarizes the components which have to be acknowledged in order to achieve mutual trust between the client and the contractor on construction projects in general. There was no literature with regard to building trust on non-partnering D&B projects specifically. The components consist of joint activities and processes that can build and sustain trust between the client and the contractor. The components for building initial trust at the start of the project (including the tender phase) include the selection of the Contractor, the setup of the contract and the setup of the joint project management systems, whereas the components for building and sustaining trust during project implementation are dependent on the people involved, how they interpret that contract and how they apply those joint project management systems.

Table 76: List of trust components based on the comparison of (Jin & Yng Ling, 2005; Kadehors, 2004; Khalfan et al., 2007; Wang & Yin, 2013; Wong et al., 2008)

Build initial trust at the start of the project (including the tender phase)	Build and maintain trust during project implementation
Components	Components
▪ Seek party with good track record, reputation and competence of financial and risk management ▪ Seek party with similar culture/policy ▪ Joint goal setting (e.g. by formalized team building workshops) ▪ Clearly defined system of communication procedures and approaches ▪ Adopt joint problem-solving philosophy ▪ Draft a clear, unambiguous and equitable contract ▪ Agreed system for achieving continuous improvement of the relationship	▪ Reasonable behaviour (=working fairly and professionally) ▪ Repeated fulfilment of communications/interactions ▪ Problem-solving to mutual satisfaction at the lower levels ▪ Emotional investments (e.g. by formalized team building workshops)

SQ2. Which aspects are necessary according to theories on change management in order to achieve an efficient and effective change management process on complex D&B infrastructure projects?

The table below shows the principles and the components which have to be included in a change management system to achieve an efficient and effective change management process on construction projects in general. There was no literature with regard to change management systems specifically for D&B projects. The

components consist of joint activities and processes that build and sustain efficient and effective change management. The components for the first principle include the setup of joint project management systems to deal with variations, whereas the components for other principles are dependent on the people involved and how they apply those joint project management systems.

Table 77: List of change management components based on the comparison of (Arain & Pheng, 2007; Egan et al., 2012; Ibbs et al., 2001; Lazarus et al., 2001; Sun et al., 2006)

Principles	Components
1. Anticipate change	- Align project goals and objectives - Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider - Agree on project philosophy with regard to risk allocation - Prior identification of areas where changes likely occur (e.g. by risk management)
2. Recognize change	- Early identification of potential changes - Assess potential impact (e.g. by value engineering) and create a proposed change order - Document the proposed change in a log
3. Evaluate change	- Determine priority of the change - Selection of optimum change options by consulting all relevant parties - Identify the likely impacts of different change options - Prompt decision making as to whether to accept/reject the change by someone with authority
4. Resolve change	- Communicate final change decision to all team members whose work is affected by it - Appropriate documentation to record all decisions within the change process
5. Monitor implementation	Monitor and record implementation
6. Learn from change	- Conduct a review and create lessons learned from the change event - Update shared databases and incorporate lessons learned for project and organization

SQ3. Which criteria with regard to construction project management and construction contract law are relevant for assessing trust and the change management process on complex D&B infrastructure projects?

Two assessment models were created on the basis of the components and the maturity models for trust and change management found by means of the literature survey. The criteria consist of the trust and change management components for construction projects in general. The models were used to assess the three standard forms of contract and the four case study projects. The assessment model for trust is shown in the table below. The maturity model by (Meng et al., 2011) is a tool to quantify the trust relationship between the parties and an adapted version of it was used to score the trust criteria in the contracts and the projects. A part of the adapted maturity model is shown below. The scores per criteria of the contracts and the case study projects can be compared with the standard in order to see which aspects should be addressed to improve the trust level.

Table 78: Assessment model for trust

Objective	Phase	Topic	Criteria = standard	Based maturity model adapted from (Meng et al., 2011)	
				Level (1-4) standard	Level (1-4)
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	
			(2) Seek party with similar culture/policy	3	
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2.5
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	
TOTAL LEVEL OF TRUST RELATIONSHIP			2.91		

Table 79: Example of the customized maturity model for relationships in construction adapted from (Meng et al., 2011)

Criteria	Topic	Sub Topic	Level 1 Low trust relationship	Level 2 Confident trust relationship	Level 3 High/strong trust relationship	Level 4 Complete trust relationship
(3)	OBJECTIVES	Objectives alignment	Only self-objectives	Mainly self-objectives	Mutual objectives in a project	Mutual objectives in the long-term
		Benefits	Win-Lose	Win-Partial win	Win-Win in a single project	Win-Win in the long-term

The assessment model for change management is shown in the table below. The maturity model by (Sun & Oza, 2008) is a tool to quantify the change management system between the parties and an adapted version of it was used to score the change management criteria in the contracts and the projects. A part of the adapted maturity model is shown below. The scores per criteria of the contracts and the case study projects can be compared with the standard in order to see which aspects should be addressed to improve the change management level.

Table 80: Assessment model for change management

Objective	Phase	Topic	Criteria = standard	Based maturity model adapted from (Sun & Oza, 2008)	
				Level (1-4)	Level (1-4)
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	
			(6) Update shared databases and incorporate lessons learned for project and organization	4	
	Recognize change	Change management process	(7) Early identification of potential changes	4	3.5
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	
			(9) Document the proposed change in a log	3	
	Evaluate change		(10) Determine priority of the change	3	
			(11) Selection of optimum change options by consulting all relevant parties	3	
			(12) Identify the likely impacts of different change options	3	
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	
			(15) Appropriate documentation to record all decisions within the change process	3	
	Monitor implementation		(16) Monitor and record implementation	3	
TOTAL LEVEL OF CHANGE MANAGEMENT				3.19	

Table 81: Example of the customized maturity model for change management adapted from (Sun & Oza, 2008)

Criteria	Aspect	Sub Aspect	Level 1 Informal change management	Level 2 Systematic change management	Level 3 Integrated change management	Level 4 Continuous improvement in change management
(7)	CHANGE MANAGEMENT PROCESS	Approach	The project team is still largely reactive to changes rather than anticipates them.	The project team begins to be proactive in anticipating changes. The project team is 'adaptive' to managing changes.	Most changes are managed proactively. The project team is 'supportive' to managing changes.	The project team is 'proactive' towards change management processes

SQ4. To what extent do the UAC-IC 2005, the NEC3 ECC and the FIDIC YB meet the set of assessment criteria?

The first table below shows an overview of the assessment results of the UAC-IC 2005, the NEC3 ECC and the FIDIC YB with respect to trust. All three standard forms of contract have quite a low trust level compared to the standard score of the criteria (2.91), which implies that the contracts are not that facilitating in terms of building

trust. The NEC3 ECC is the most facilitating with regard to trust. Not only does this contract contain the principle of good faith by means of clause 10.1 which requires the parties to act reasonable (e.g. take each other's reasonable interests into account and be co-operative), but it also includes some project management systems and tools which can be used to build trust such as the partnering option, the mutual early warning, the risk reduction meetings, the open book, the pain/gain share mechanism, and the performance measurement option. Further, in contrast to the other two contracts, by default the DAB is authorized to settle disputes and has to be set up before the starting date. Aspects which may cause contention between the parties are the Project Manager's dual role in the CEs procedure (i.e. as the Employer's agent and as a certifier) and the sanctions of CEs time bars (i.e. the Contractor loses his entitlement to compensation and the deemed acceptances on the part of the Project Manager). The NEC3 can be used as a joint Project Management Plan (PMP) as well, whereas the UAC-IC 2005 and the FIDIC YB require the parties to draw up a separate PMP as these contracts do not contain many project management systems and tools which can be used to build trust. Trust in the UAC-IC 2005 is mainly facilitated by means of the principle of good faith in Art. 6:2 and Art. 6:248 in the DCC, the Procurement Act 2012 (i.e. MEAT award criterion, procurement procedures, and selection requirements) and the equitable risk allocation (i.e. to a large extent the risks are allocated to the party best able to manage them), whereas the FIDIC YB mainly promotes distrust by means of the absence of the principle of good faith, the absolute risk allocation as the parties are fully responsible for their risks (i.e. find solutions or bear the consequences), the unequitable risk allocation (i.e. the geotechnical conditions are not allocated to the party best able to manage them), and the sanction of the claims time bar (i.e. the Contractor loses his entitlement to compensation).

Table 82: Overview of the assessment results of the UAC-IC 2005, NEC3 ECC and FIDIC YB regarding trust

	UAC-IC 2005	NEC3 ECC	FIDIC YB
Trust level	1.32 Low	1.91 Confident	0.91 Low
Most important aspects which may build trust (ITALIC = distrust)	(1) Procurement Act 2012 (3+8) Good faith in the DCC (6) Equitable risk allocation	(3+8) Clause 10.1 (3) Option for partnering (5) Mutual early warning (5) Risk reduction meetings (5) Open book requirement (6) Option for pain/gain share mechanism (7+11) Option for measuring Contractor's performance (10) Standby DAB (5) Project Manager's dual role (10) Sanctions of CEs time bars	(3+8) Lack of a good faith requirement (5) Parties are fully responsible for their risks (5) Engineer's dual role (6) Unfair risk allocation (10) Sanction of claims time bar

Table 83: Overview of the assessment results of the UAC-IC 2005, NEC3 ECC and FIDIC YB regarding change management

	UAC-IC 2005	NEC3 ECC	FIDIC YB
CM level	1.31 Informal	1.56 Informal - Systematic	1.09 Informal
Most important aspects which may create efficiency and effectiveness (ITALIC = inefficiency and ineffectiveness)	(2) Quite efficient and effective (4) Lack of RM requirements (7-16) Absence of some implicit standard CM processes	(2) Open book (3) Option of pain/gain share mechanism (4) Link with RM (7) Mutual early warning (2) Quite extensive and complicated (2) Project Manager's dual role (7-16) Absence of some implicit standard CM processes	(2) Quite straightforward (2) Open-ended sometimes (2) Engineer's dual role (4) Limited RM requirements (7-16) Absence of some implicit standard CM processes

The first table above shows an overview of the assessment results of the UAC-IC 2005, the NEC3 ECC and the FIDIC YB with respect to change management. Even though all standard forms of contract contain a change management procedure, all three scores for the change management level are quite low as well compared to the standard score of the criteria (3.19), which implies that the contracts are not that facilitating in terms of creating an efficient and effective change management process. The main cause is that the contracts do not contain provisions for many criteria in the assessment model such as for aligning the objectives, learning from changes and some implicit standard change management processes. The levels of the criteria which did receive a score are more or less the same for the three contracts. The main difference between the contracts are the provisions for risk management, which can be used to create a more efficient and effective change management process. The NEC3 ECC is the most facilitating contract with respect to change management, because this contract does contain risk management provisions (e.g. the mutual early warning, the risk reduction meetings, and the option of the pain/gain share mechanism) which are closely related to change management. The UAC-

IC 2005 and the FIDIC YB do not contain risk management requirements or they are limited. Further, the open book regarding the Contractor's cost data in Main Options C-F in the NEC3 ECC may speed things up during the change management process, whereas the Project Manager's and the Engineer's dual role (i.e. as the Employer's agent and as a certifier) in the NEC3 ECC and the FIDIC YB, respectively, may cause contention between the parties during the process and slow things down.

SQ5. To what extent do the case study projects A+B, C and D in which the UAC-IC 2005, the NEC3 ECC and the FIDIC YB were applied respectively meet the set of assessment criteria and correspond to the assessment results of question 4?

The table below shows an overview of the assessment results of the four case study projects with respect to trust. The trust levels are quite different on the four projects, which is caused by many different factors. Only project Forres exceeds the standard trust level of the criteria (2.91), which implies that the trust level on this project is quite high. On all four projects, the criteria for continuous improvement of the relationship (7+11) were not that prevalent, which partly has contributed to lower trust levels compared to the standard trust level. On project Forres, the high trust level is mainly caused by the client leadership (e.g. choice for Best Value Procurement, pain/gain share mechanism, co-location and the integrated Project Team) and the strategic partnership (e.g. the continuity of staff, the relationships built, the working culture created, and the streamlined project management systems and tools). The trust level on project Bijlmerweide is also quite high due to the direct agreement procedure (i.e. the Employer was allowed to invite the contractors of their own choice) and the very competent, passionate and motivated Contractor's team. On project Dikkowita, the trust level is quite low due to a mix of trust and distrust. On the one hand, there was a direct negotiations procedure, the Contractor was delivering a high quality product and both parties had confidence in each other's ability to perform well. On the other hand, the Employer requested a major scope change within the same budget (due to the grant) at the beginning of the project, which may have partly instigated the Contractor to issue the unexpected, unjustified or unreasonably priced variations requests and claims. The trust level on project Drachtsterweg is quite low, because of the many amendments unilaterally made to the UAC-IC 2005 to the disadvantage of the Contractor, the lowest price tender, and the disagreement about the Employer's traditional leadership.

Table 84: Overview of the assessment results of the four case study projects regarding trust

	Bijlmerweide	Drachtsterweg	Forres	Dikkowita
Trust level	2.41	2	3.23	2.18
	Confident – High	Confident	High	Confident
Most important aspects which build trust (ITALIC = distrust)	(1+2) Direct agreement procedure (1) MEAT award criterion (3) Focus on the target (3) Adherence to QMS (3) WIN for all parties (8) Contractor's goodwill, passion and motivation (8) Mutual reasonable and fair behaviour (9) A lot of informal communication	(1) <i>Lowest price tender</i> (3) <i>Contradictory project objectives</i> (6) <i>'Like it or lump it' contract</i> (8) <i>Employer's traditional way of acting</i> (8) <i>No mutual reasonable and fair behaviour</i>	(x) Client leadership (x) Strategic partnership (1+2) Best Value Procurement (3) Focus on the target (3) WIN for all parties (3) Mutual project objectives (5) Joint problem-solving (5) Open book (6) Negotiated contract (6) Pain/gain share mechanism (8) Mutual reasonable and fair behaviour (8) Selection of the right people (9) A lot of informal communication	(1) Direct negotiations (3) High quality product (6) Negotiated contract (8) Confidence in each other's competences (9) A lot of informal communication (3) <i>No WIN for all parties anymore</i> (3) <i>Major scope change at beginning</i> (3) <i>Late 'final scope agreement'</i> (3+10) <i>Contractor did not finish the job</i> (5) <i>'Like it or lump it' problem-solving</i> (5) <i>Some unexpected, unjustified or unreasonably priced variations requests and claims</i> (5+8) <i>Engineer's dual role</i> (8) <i>10% of the time mainly self defence</i>

The case study contains projects which are carried out in different cultures. Trust may be perceived differently per culture, therefore 'culture' was taken into account in the case study as well. Despite the cultural differences, the meaning of trust seems to be more or less the same on all four case study projects, there are two particular reasons for that. First, with regard to project Forres, the British culture mainly differs from the Dutch culture in terms of the Masculinity versus Femininity index (Hofstede, 2015). The British culture is masculine/performance oriented, whereas the Dutch culture is feminine/co-operation oriented. On the Forres project, the contract is performance oriented, but the Project Team is co-operation oriented. On the one hand, the focus is on performance by means of the pain/gain share mechanism and trust implies enforceable trust (i.e. trust in good performance that is backed up by the option of rewarding and punishing the Contractor). On the other hand,

with respect to other matters, trust implies intrinsic trust (i.e. trust that accepts vulnerability) and implicit trust is high on the project. Second, with regard to project Dikkowita, the Sri Lankan culture mainly differs from the Dutch culture in terms of the Power Distance Index and the Individualism versus Collectivism index (Hofstede, 2015). The Sri Lankan culture has a large power distance and is collectivistic, whereas the Dutch culture has a small power distance and is individualistic. On project Dikkowita, the Engineer had full authority to act on behalf of the Employer and he did so. The Engineer and the Contractor's key people were all Dutch, so 'trust' should have had the same meaning for them. Therefore, the cultural differences were not really a big issue on the project, there were merely some cultural differences between the Dutch parties and the Sri Lankan Employer, and between the expats and the Sri Lankans in both the Engineer's and the Contractor's teams.

On projects Bijlmerweide, Drachtsterweg and Dikkowita, the contract seems to have little influence (about 0-25%) on the trust level between the parties. Most of the trust building aspects on the projects do not stem from the contract, but rather from other factors. The principle of good faith in the UAC-IC 2005 (Art. 6:2 and Art 6:248 in the DCC) does not seem to be very effective and to have much influence on the trust level between the parties either on the projects Bijlmerweide and Drachtsterweg. On both projects, the parties do not act in good faith because it is written in the DCC, but acting in good faith is rather a norm for the people involved on the project. Only at the highest escalation level on project Drachtsterweg, the parties do act in good faith because of the DCC. On project Forbes, the NEC2 ECC has a bit more influence (about 50%), because many of the project management systems and tools in the contract which form a basis to create trust were actually applied and were quite effective on the project (e.g. the pain/gain share mechanism, the open book requirement, a risk management procedure and a mutual early warning obligation). The principle of good faith in the NEC2 ECC (clause 10.1) does not seem to have much influence on the trust level between the parties. On project Forbes, this 'mutual trust and co-operation' clause is not effective in itself, but it does form a good basis for building trust. The intention of the clause is clear, but it remains open to interpretation and cannot be enforced. Therefore, the creation of trust is very dependent on the people involved. In general, it can be concluded that the standard form of contract has little influence (about 0-25%) on the trust level between the Employer and the Contractor and that it is not that fundamental for building trust. The amount of influence increases as more project management systems and tools which form a basis to create trust are included in the contract.

Table 85: Overview of the assessment results of the four case study projects regarding change management

	Bijlmerweide 2.19 Systematic	Drachtsterweg 2.25 Systematic	Forbes 2.75 Integrated	Dikkowita 2.28 Systematic
Most important aspects which create efficiency and effectiveness (ITALIC = inefficiency and ineffectiveness)	(x) Mutual trust (2) Clear and efficient CM procedure (7) Informal discussions (7) Separate regular variations meetings (4) <i>RM not closely related to CM</i> (7) <i>Half reactive/half proactive to largely proactive CM approach</i> (7) Early informal notifications (4) <i>RM not closely related to CM</i>	(2) Clear and efficient CM procedure (7) Informal discussions (7) Separate regular variations meetings (4) <i>RM not closely related to CM</i> (7) <i>Half reactive/half proactive to largely proactive CM approach</i> (7) <i>Ineffective warning obligations</i> (7-16) <i>Disagreements about the price</i> (7-16) <i>Escalations</i>	(1) Aligned RM objectives (2) Clear and streamlined CM procedure (3) Joint risk workshop (3) Clear risk allocation (3) Pain/gain share mechanism (4) RM closely related to CM (4) Clear RM procedure (4) Joint RM (4) Aligned largely proactive RM approach (7) Mutual EW (7) Informal discussions (7) Aligned largely proactive CM approach (7-16) Open book contract (7-16) Involvement of independent Cost Consultant (7-16) No unexpected or contentious variations (7-16) <i>Extensive CEs procedure increases administrative burden</i>	(1) Aligned CM objectives (2) Clear CM procedure (4) <i>RM not closely related to CM</i> (7) <i>Unaligned CM approach</i> (7) <i>Identification of potential variations by means of claims notifications</i> (7-16) <i>Engineer's dual role</i> (7-16) <i>Engineer has no authority to give instructions for variations</i> (7-16) <i>Timelines tended to drift after initial notification</i> (7-16) <i>Project funding and associated requirements</i> (7-16) <i>Unexpected, unjustified or unreasonably priced variations requests and claims</i>

The table above shows an overview of the assessment results of the four case study projects with respect to change management. On all four projects, the change management level is lower than the standard score of the criteria (3.19), which is partly caused by the lack of effort to learn from changes (5+6) on all projects as most variations stem from 'gaps' in the contract. Despite the latter, the results show that on all four projects, there is still room for improvement in the efficiency and the effectiveness of the change management process, even though the change management procedure is quite clear and efficient. Project Forbes has a higher change management level than the other three projects, which is essentially because risk management is closely related

to change management on this project only. Further, on projects Drachtsterweg and Dikkowita, unexpected or unjustified variations requests, disagreements about the price, and escalations have resulted in inefficient and ineffective change management processes. The change management level in project Bijlmerweide should be a bit higher, because in the assessment model 'not following the change management processes consistently' is rated with a low score, but on this project 'inconsistency' (i.e. submit the change orders afterwards) is for the purpose of increasing the overall efficiency as the works can continue.

On project Bijlmerweide, the UAC-IC 2005 has very little influence (0%) on the change management level. The parties do not apply the change management procedure in the UAC-IC 2005, because it is too circuitous and onerous for the small size and the short duration of the project. On the other projects, the standard form of contract is quite important for the change management process, because the change management procedures used on the projects are mostly based on the ones in the contracts. The change management procedures in the contracts are quite effective and are tailored to each project by adding and omitting steps. So the contract has neither little nor much influence (about 50%) on the change management level. On the Forres project, the contract has a bit more influence (about 75%) on the change management process, because some of the risk management clauses in the contract which are closely related to change management were actually applied and were quite effective on the project (e.g. the pain/gain share mechanism, the open book requirement). The risk management procedure and the mutual early warning obligation were also effective, but they were only partly based on the NEC2 ECC. In general, it can be concluded that the standard form of contract has neither little nor much influence (about 50%) on the change management level and that it is quite fundamental for creating an efficient and effective change management process. The amount of influence increases as more risk management clauses which can be used to identify variations early on are included in the contract.

SQ6. What can be learned by comparing the four case study results with regard to the influence of mutual trust between the client and the contractor on the efficiency and the effectiveness of the change management process on complex D&B infrastructure projects?

According to the interviewees, trust between the Employer and the Contractor has much influence (about 75%) on the efficiency of the change management process. Their main argument is that if there is trust, there will be no unjustified, unexpected and unreasonably priced variations. As a result, the Contractor has to submit less substantiation of the variation and the Employer does not expect to find any problems and needs less time to check the variation and its impact and there will be a quicker acceptance of the fact that it is a variation to the contract. As stated by the interviewees, trust between the Employer and the Contractor has neither little nor much influence (about 50%) on the effectiveness of the change management process. Three main arguments can be distinguished. First, if there is trust, the Contractor will more likely submit a right and verifiable change option and impact (trust based on competences and experience) and the Employer has less doubts about whether it is a right change option and whether it adds value. Second, if there is trust, the Contractor is working towards the same goal or outcome for changes, so they do not submit unjustified, unreasonable and unexpected variations. Third, if there is trust, the parties are less reluctant to agree to the variation, to believe that it is a variation to the contract, to co-operate and to deal with the variation. Further, the 'effectiveness' is also influenced by the 'efficiency', as 'a minimum use of resources' to implement a change may also be an objective of the change management process due to a maximum budget.

From the two statements above can be concluded that the efficiency and the effectiveness of the change management process can be increased indirectly by means of building trust between the parties. Therefore, the decisive aspects in terms of trust and distrust building from every project were compared per cluster (i.e. procurement, contract, people, process and product) in order to find fundamental trust building aspects. Irrespective of the standard form of contract, there are two fundamental aspects for building trust which were derived from the comparison: 'a WIN-WIN situation throughout the project' and 'a clear and aligned client leadership'. These two aspects are fundamental because everything else flows from them and everything else (including the change management process) will not work as efficient and effective without them.

‘A WIN-WIN situation throughout the project’ should be stated as a mutual project objective and implies that the project has to be commercially viable (i.e. benefitting) for both parties throughout the project. A WIN-WIN situation may be difficult to establish due to the contradictory interests of the parties. Therefore, in order to achieve this objective, it is paramount that the parties create mutual respect and understanding for each other’s interests, that the parties are satisfied with their established WIN situation, and that the parties safeguard the WIN situation for both parties throughout the project. An equitable contract between the Employer and the Contractor is important to facilitate the establishment of such WIN-WIN situation. Such contract means a fair risk allocation and a fair benefits allocation. The former implies that the risks are allocated to the party best able to manage them and that the risk owner receives an appropriate risk allowance (Meng et al., 2011). The latter implies that the benefits are proportionate to the parties’ effort they are putting into the project (Khalfan et al., 2007, p. 389; Wang & Yin, 2013, p. 584).

‘A clear client leadership’ means that the client should have a clear and detailed vision of how they want to collaborate with the Contractor (e.g. how much involvement and collaboration) and how they want to control the project (e.g. the costs and the risks). This vision should be used to set up the procurement of the Contractor (i.e. project delivery system, type of contract, procurement procedure and award criteria) in order to find the Contractor who is best able to perform the job and who falls in line with the Employer’s desired way of working the best. After the contract award, the parties have to align the client leadership jointly in order to optimize the collaboration. This ‘aligned client leadership’ should have a driving influence throughout the project and establish a project culture in which both parties perform to their best abilities. Therefore, the project teams have to be set up in accordance with the ‘aligned client leadership’. The aligned client leadership should clearly state the way of working in terms of both parties’ roles and responsibilities, the expectations of both parties, and what reasonable and fair behaviour implies on the project (by means of examples). The people on the Employer’s and the Contractor’s team should be able and willing to work in that manner. Further, the parties also have to setup the joint project management systems and approaches in accordance with the ‘aligned client leadership’. In this research, a number of improvements to standard project management systems were identified, which were proven to be effective for building trust or creating an efficient and effective change management process. These were elaborated in Chapter 8 and are included in the UAC-IC 2005 recommendations under cluster ‘process’. The project management systems and tools including these improvements will only work efficiently and effectively if there is a WIN-WIN situation and if they are jointly agreed and adjusted to the aligned client leadership.

RQ: To what extent does mutual trust between the client and the contractor influence the efficiency and the effectiveness of the change management process on complex D&B infrastructure projects, and which aspects can be derived from the comparison between the UAC-IC 2005 and the NEC3 ECC and the FIDIC Yellow Book to create an efficient and effective change management process based on mutual trust for such projects using the UAC-IC 2005?

Trust between the Employer and the Contractor has much influence (about 75%) on the efficiency of the change management process and it has neither little nor much influence (about 50%) on the effectiveness of the change management process. Therefore, the efficiency and the effectiveness of the change management process can be increased indirectly by means of building trust between the parties. A high trust level between the parties forms a good basis for an efficient and effective change management process.

Recommendations regarding the creation of an efficient and effective change management process based on trust for projects using the UAC-IC 2005 are given in the form of an annex which could be added to the UAC-IC 2005 (see table below). The recommendations are categorized by means of clusters (i.e. strategy, procurement, contract, people, process and product) and consists of the trust building and the efficiency and effectiveness creating aspects which were found by means of comparing the case study project. Two fundamental aspects for building trust were identified and included in the cluster ‘strategy’: ‘a WIN-WIN situation throughout the project’ and ‘a clear and aligned client leadership’. These two aspects are fundamental because everything else flows

from them and everything else (including the change management process) will not work as efficient and effective without them.

As the UAC-IC 2005 did not have much influence on the trust levels in both UAC-IC 2005 case study projects and do not contain many project management systems and tools, it was decided to create a general and clear overview of how to build an efficient and effective change management process based on trust, as it is not a matter of adding one or two things to achieve that because the recommendations are closely linked and need to be seen as a whole. Therefore, some recommendations may already be included in the UAC-IC 2005 or in the documents and laws directly related to this contract. The **BOLD** aspects in the annex indicate that they are already fully or partly covered by such provisions, these aspects are commented in the table as well. The second column indicates to which existing clauses the recommendations are applicable.

The recommendations in the annex are stated as aspirations, because it is not useful to define these in the standard form of contract as they are dependent on the 'client leadership' and need to be tailored to each project. Aspirations show how the author would want them to be developed and work on the project. The possible improvements to the standard project management systems are also stated in the annex in cluster 'process'. The elaboration of all aspects in the annex can be found in chapter 8. The *ITALIC* aspects in the annex indicate that they were derived from either the NEC3 ECC or the FIDIC YB.

Table 86: Annex to the UAC-IC 2005 for creating an efficient and effective change management process based on trust

STRATEGY	§3	1. Prior to the procurement of the Contractor, the Employer has to determine the client leadership, which implies creating a clear and detailed vision of how they want to collaborate with the Contractor and how they want to control the project. This client leadership should be used to set up the procurement of the Contractor.
	§3 + §4	2. After the contract award, the Employer and the Contractor have to align the client leadership jointly in order to optimize the collaboration. This aligned client leadership should have a driving influence throughout the project and establish a project culture in which both parties perform to their best abilities.
	§3 + §4 + Art. 6:2 and Art. 6:248 in the DCC + Art. 2 Basic Contract + All risk clauses (§13, §41, §44 etc.)	3. State 'a WIN-WIN situation throughout the project' as a mutual project objective. This objective should be realistic and achievable. The following is paramount in order to achieve this objective: a. the parties have to create mutual respect and understanding for each other's interests on the project b. the parties are satisfied with their established WIN situation - in case of a negotiated contract, the parties can establish a WIN-WIN situation by means of a formal joint goal setting workshop - in case of a non-negotiated contract, the Employer and the Contractor can establish their WIN situation directly by means of the Employer's Requirements and the tender respectively, but the Employer also has to facilitate a WIN situation for the Contractor during procurement by means of not applying a lowest price procedure and drawing up an equitable contract. c. the parties safeguard the WIN-WIN situation throughout the project
		Explanatory notes to recommendations in BOLD : o 3a. The principle of objective good faith in Art. 6:2 and Art 6:248 in the Dutch Civil Code (DCC) has the three functions of interpretation, supplementation, and correction and limitation, and it does oblige the parties to take each other's reasonable interests into account. Most people are not aware that the principle is written in the DCC and if they act in good faith it is merely because it is a norm to them. The UAC-IC 2005 do not refer to the DCC with respect to good faith. Explicitly stating the principle of good faith from the DCC in the UAC-IC 2005 may make it more effective as it may instigate people to think about it and take it more into account so that it forms a better basis for building trust. However, its effectiveness depends on the people involved as words are not effective in themselves. The intention of the principle is clear, but is open to interpretation, therefore the parties should agree on what reasonable and fair behaviour implies on the project (see cluster 'people').
PROCUREMENT	§3 + Art. 5 Basic Contract §3 §3 + Public Works Procurement Regulations 2012 + Procurement Act 2012	4. Use the client leadership to set up the procurement of the Contractor. The following is paramount in order to select the right Contractor: a. Apply the right project delivery system (e.g. D&B or E&C) b. Apply the right type of contract (e.g. standard or collaborative) c. Apply the right procurement procedure (e.g. standard, BVP or competitive dialogue): one in which the Employer can assess which Contractor is best able to perform the job and falls in line with the Employer's desired way of working the best. d. Apply the right award criteria: always apply the MEAT award criterion (i.e. price and quality) at the least instead of going for the lowest price tender. e. Assess whether the Contractor has the right people to perform the job: request CV's of key people of the project implementation team, talk to referees and involve these key people in the tender phase
		Explanatory notes to recommendations in BOLD : o 4a. In Art. 5 in the Basic Contract, the Employer has to indicate what the Employer's Requirements consist of (e.g. the conceptual design and the preliminary design) and what design work the Contractor has to perform (e.g. developing the conceptual design and the preliminary design into a basic design and a final design). Employers should take into account that choosing the project delivery system requires more than thinking about the amount of design work for the Contractor as it also requires them to think about how they want to collaborate with the Contractor and how they want to safeguard and control the design. o 4c. Article 7 in the Directive 2004/18/EC lays down the size limits for public contracts to determine whether they have to be put out to European tender or not (Chao-Duvis et al., 2013, p. 138; Pianoo, 2014b). The Public Works Procurement Regulations (in Dutch: Aanbestedingsreglement Werken) 2012 sets out several procurement procedures including

		restrictions to them for both European and National tenders which clients may apply (Doornbos et al., 2013, pp. 220-224). 4d. Pursuant to Art. 2.114 in the Procurement Act 2012, in principle, the Most Economically Advantageous Tender (MEAT) award criterion has to be applied to all procurements (i.e. above and below the European tender limits). The contracting authority may apply the lowest price criterion if they have valid reasons to do so and state them in the tender documents. The contracting authority is free to choose the other award criteria besides the price in as far as they are related and proportionate to the contract that is being awarded and are transparent, objective and unambiguous. They are also free to choose the assessment method for the award criteria in as far as the assessment method is proportionate to the contract that is being awarded and does not lead to a lowest price tender in the end (Pianoo, 2014c, 2015).
CONTRACT	§3 + Procurement Act 2012 Art. 2 Basic Contract	5. Draw up an equitable contract in terms of allocating the benefits and the risks fairly. The following is paramount in order to achieve this: a. Do not apply a lowest price tender, but use the MEAT award criterion (price and quality) at the least. b. Proportionate the benefits to the parties' effort they are putting into the project (e.g. a proportionate contract price, profit and risk allowance for the Contractor). c. Do not amend the contract unilaterally to the disadvantage of the Contractor, but negotiate the contract or do not make amendments to the standard form of contract at all. d. Allocate the risks to the party best able to manage them in case of a project-specific risk allocation
	§3 + Procurement Act 2012 All risk clauses (§13, §41, §44 etc.) + Procurement Act 2012	Explanatory notes to recommendations in BOLD : 5a. See remark on 4d. 5c. According to Instruction 3.9C in (Schrijfgroep Gids Proportionaliteit, 2013, p. 53) to Art. 1.10 sub section 2 in the Procurement Act 2012, the contracting authority has to use existing, jointly prepared General Terms and Conditions (GTC) for a certain project delivery system as the conditions are balanced for both the contracting authority and the tenderer in such GTC. In particular cases, it may be necessary to deviate from such GTC, but deviations should always be clearly motivated. 5d. According to Instruction 3.9A in (Schrijfgroep Gids Proportionaliteit, 2013, p. 52) to Art. 1.10 sub section 2 in the Procurement Act 2012, the contracting authority has to allocate the risks to the party best able to manage or to influence them.
PEOPLE	§3 + §4 + Art. 6:2 and Art. 6:248 in the DCC	6. The aligned client leadership should clearly state the way of working in terms of both parties' roles and responsibilities, the expectations of both parties, and what reasonable and fair behaviour implies on the project (by means of examples).
	§2	7. Select the right people: the Employer's and the Contractor's team consists of people who are able and willing to work in accordance with the aligned client leadership.
	§3 + §4 + Art. 6:2 + Art. 6:248 DCC	8. Act reasonable and fair towards the other party at all levels between the project teams and throughout the project.
	§2 + §14.1 + §15	9. Oblige a party to request the other party's approval for replacements of the key people (i.e. the representatives and team leaders) in their project team.
		10. Allow both parties to request the other party to remove an employee from the project in case he is not acting in accordance with the aligned client leadership.
		Explanatory notes to recommendations in BOLD : 6. See remark on 3a. 8. See remark on 3a. 9. §2 in the UAC-IC 2005 only requires the Contractor to request an acknowledgement by the Employer by means of the acknowledgement procedure in §23 for their representative with respect to the works and the maintenance works and their substitute for him. 10. Pursuant to §14.1, the Employer may only instruct the Contractor to remove their representatives from the project, but not any member of their team.
PROCESS	§3 + §4	11. Jointly setup the project management systems and approaches in accordance with the aligned client leadership. The parties should streamline and tailor them to the project, which also applies to existing project management systems in the standard form of contract. Examples of essential standard project management systems are given below and examples of improvements to these systems are given between brackets. a. A clearly defined incentive and sanction system, can only be aligned in case of a negotiated contract (incentives, such as bonuses and a <i>pain/gain share mechanism</i> are more effective than sanctions to create focus on the target in terms of costs and programme, but they have to be proportionate to the contract price) b. A clearly defined formal communication system (in case of a communication overload, prioritize communication and/or agree on the submission dates beforehand) c. A clearly defined informal communication system (informal communication at all levels between the project teams, preferably on a day-to-day basis by means of a fulltime co-location) d. A clearly defined risk management system and roles therein (joint risk workshop to identify, discuss and allocate project-specific risks fairly, align the risk management approach between the parties, separate joint risk review meetings, manage the Employer's risks jointly) e. A clearly defined problem-solving system (align the extent to which the parties collaborate and help each other and with regard to which aspects to resolve problems, formal and informal <i>mutual early warning for risks</i>, formal and informal <i>early warning meeting</i>, define the escalation model jointly) f. A clearly defined claims system (<i>open book regarding the Contractor's cost data</i>, involve an independent cost consultant to draw up the quotation, only include the direct costs of the works in the claim and reimburse the indirect costs separately) g. A clearly defined change management system and roles therein (quick informal decision-making in case it is beneficial to both parties that the variation is implemented prior to the paperwork, align the change management approach between the parties, <i>open book regarding the Contractor's cost data</i>, involve an independent cost consultant to draw up the quotation, only include the direct costs of the works in the claim and reimburse the indirect costs separately, <i>mutual early warning for variations due to risks</i> and ambiguities in contract documents, separate formal variations meeting, jointly discuss potential variations prior to the formal procedure) h. A clearly defined relationship management system (fulltime co-location, informal or social events, Project Follow Up workshops, team building workshops, interventions by the parties' Project Directors) i. A clearly defined quality management system (take into account variations due to uncorrectable deviations)
	Art. 16 Basic Contract + §36	
	§3 + §4	
	§3 + §4	
	§44	
	§14 + §15 + §45 +	
	§4.7 + §20.4 + §21.10 + §22.3 + §28.1	
	§3 + §4	
	§19-23	

		Explanatory notes to recommendations in BOLD: ○ 11a. The UAC-IC 2005 merely contains a possibility to give bonuses and fines with respect to the programme. ○ 11f. The cost compensation and/or extensions of time due to Contractor's claims are dealt with in §44. The improvements given between brackets may speed up the claims process. ○ 11g. The change management procedure is dealt with in §14, §15 and §45. The improvements given between brackets may make the change management process more efficient and effective. ○ 11g. The UAC-IC 2005 do include warning obligations for the Employer and the Contractor, but these are limited to errors in documents, decisions, goods, variations and so on, and are not meant to warn for any risks directly. The Employer's warning obligation is not comparable to the Contractor's as the Employer's warning obligation is only applicable to errors which they actually discovered or should have discovered, and not to obvious errors. Further, the warning obligations are not directly linked to variations, therefore they are not used to identify potential variations early on. ○ 11i. The quality management system is dealt with in §19-23. With respect to change management, the parties should take into account that many variations may arise due to uncorrectable deviations to the Employer's Requirements.
PRODUCT	§3 + §4	12. Clearly state in the Employer's Requirements what the Employer needs and what 'fitness for purpose of the works' means according to them.
	§3 + §4	13. Create other realistic and achievable mutual project objectives besides 'fitness for purpose of the works' and 'a WIN-WIN situation throughout the project' which are superior to the parties' own objectives by means a formalized joint goal setting workshop.
		Explanatory notes to recommendations in BOLD: ○ 12. The UAC-IC 2005 do not explicitly state that the works have to be fit for purpose, but the requirement of this standard of care can be derived from sub clauses §4.1 and §4.3. The fitness for purpose requirement is often a point of contention between the parties. Following the recommendation would certainly lower the probability of contention about it.

10.2 Recommendations for future research

The first three recommendations are related to the annex, whereas the other recommendations are related to the literature gap and the research limitations discussed in chapter 9:

- The Procurement Act 2012 was not fully taken into account when drawing up the annex as procurement law was not part of the research. Therefore, it is recommended to research the compatibility of the annex with the Procurement Act 2012.
- The annex was not tested in practice, so it is recommended to test the applicability and the effectiveness of the annex on real D&B projects using the UAC-IC 2005.
- The annex was constructed as a general overview of how to create an efficient and effective change management process based on trust. Hence, the applicability and the effectiveness of the annex can also be tested on real D&B projects using other standard forms of contract.
- In this research, the number of case study projects was limited as there was one case study project for each standard form of contract. The applicability of the annex may be improved by conducting the same research with much more case study projects and more different standard forms of contract. The assessment models and the maturity models have to be reviewed for such research though.
- There was no literature with regard to change management systems specifically for D&B projects. This research has reviewed the generic change management system on construction projects in general, but the research also identified the quality management system (QMS) as a great source of variations on D&B projects as many variations stem from uncorrectable deviations. The QMS was not part of the research, therefore it is recommended to conduct more research into change management on D&B projects to create a generic change management system specifically for D&B projects.

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3. List of abbreviations

ADR	Alternative Dispute Resolution
BVP	Best Value Procurement
BW	Bijlmerweide
CE	Compensation Event
CM	Change Management
CMP	Contract Management Plan
D&B	Design & Build
D&C	Design & Construct
DAB	Dispute Adjudication Board
DBB	Design-Bid-Build
DCC	Dutch Civil Code
DFH	Dikkowita Fishery Harbour
DW	Drachtsterweg
E&C	Engineering & Construct
ENG	Engineer
ER	Employer's Requirements
EW	Early Warning
F	Forres
FIDIC YB	FIDIC Yellow Book
GTC	General Terms and Conditions
KPI	Key Performance Indicator
NEC3 ECC	NEC3 Engineering and Construction Contract
OG	Opdrachtgever (=Dutch for Client)
ON	Opdrachtnemer (=Dutch for Contractor)
PM	Project Manager
PMI	Project Manager's Instruction
PMP	Project Management Plan
PT	Project Team
RHDHV	Royal HaskoningDHV
RM	Risk Management
RQ	Research Question
SQ	Sub Question
TMC	The Moray Council
TNR 2005	The New Rules 2005
UAC 2012	Uniform Administrative Conditions 2012
UAC-IC 2005	Uniform Administrative Conditions Integrated Contract 2005
WI	Works Information

4. The general context: The delineation of the research project

The following delineation was made for this research, which is elaborated in the next sub sections:

Infrastructure projects – Construction project management – Construction contract law – Design & Build – The Netherlands – Complex projects – UAC-IC 2005 – NEC3 ECC – FIDIC Yellow Book – Scope changes – Change management process – Mutual trust between client and contractor

4.1 Dutch construction industry

Two main segments of the Dutch construction industry are ‘buildings’ and ‘infrastructure’. The buildings segment consists of the construction, maintenance and renovation of residential and non-residential buildings. The infrastructure segment encompasses the construction and maintenance of roads, water works and earth works.

Table 87: Division of clients in the Dutch construction industry in 2012 (Vrolijk & Holtackers, 2013, pp. 11, 15)

Client Buildings	In %	Client Infrastructure	In %
Government	9	Government	55
Housing corporations	29	Commercial companies	30
Commercial companies	26	Contractors	9
Contractors	8	Individuals	3
Individuals	19	Other clients	3
Other clients	9		

Table 87 shows that the buildings segment consists of many different clients, whereas the infrastructure segment consists of public clients to a large extent, which are the central government, the provinces, the municipalities, the water boards, and other public bodies. Although the UAC-IC 2005 are meant for both infrastructure and building projects, only infrastructure projects are part of the research scope since the UAC-IC 2005 have hardly been applied on building projects up to now (Cremers, Kuypers, & Mooiman-Salvani, 2006, p. 5).

4.2 Construction project management

This research is about construction project management, which concerns ‘the application of knowledge, skills, tools, techniques to project activities from beginning to completion to meet the project requirements’. Managing the project typically includes identifying project requirements, stakeholder management, and balancing the competing project constraints (e.g. scope, quality, schedule, budget, resources, and risk) (Project Management Institute, 2008, p. 6). Aspects related to construction project management are included in this research, which basically means that consequences for the common project objectives of scope, quality, time and cost are taken into account.

4.3 Construction contract law

This research is also about construction contract law. A construction contract basically lays down the contractor’s obligation to carry out certain activities in order to deliver the required output of the client, and the client’s obligation to pay the price for the delivery. Reasons for drawing up a construction contract are, for example, to safeguard the interests of both parties, to coordinate (i.e. to specify both parties’ goals and the ways to achieve these), to safeguard for contingencies and to demonstrate both parties’ commitment (Klein Woolthuis, Hillebrand, & Nooteboom, 2005, p. 835). A basic construction contract between client and contractor consists of a Model Agreement and the corresponding General Terms and Conditions (GTC). The following elements are usually included:

- the obligations of both parties;
- general data such as start and completion date, specifications, quality and quantity, variations;
- the conditions and procedures for payments;
- the responsibilities and liabilities of both parties;
- provisions concerning early termination or suspension of the contract;
- the responsibilities and liabilities of both parties during handover and after completion;
- the liabilities for damage;
- and the procedures for coordination (Van der Heijde & Jurg, 1998, p. 16).

4.4 Standard forms of construction contract

Worldwide, there are many standard forms of construction contract, for example, FIDIC’s conditions of contract, JCT contracts, NEC contracts, and ACA contracts. In the Netherlands the most commonly used standard forms of contract are the Uniform Administrative Conditions for the Execution of Works and Technical Installation Works (UAC 2012; for Design-Bid-Build projects), Uniform Administrative Conditions for Integrated Contracts (UAC-IC 2005; for Design & Build project), and The New Rules 2011 (DNR 2011; contract with a consultant).

Obligated use of certain standard forms of construction contract in the Netherlands

Since April 1st 2013, the Netherlands have a new procurement law (Aanbestedingswet 2012). This law considers the principle of proportionality as one of the key procurement principles. Proportionality implies that the contracting authority’s choices for requirements and terms and conditions in a procurement must be proportionate to the nature and scope of the contract that is being awarded. According to Instruction 3.9C in (Schrijfgroep Gids Proportionaliteit, 2013, p. 53) to Art. 1.10 sub section 2 in the Procurement Act 2012, the contracting authority has to use existing, jointly prepared General Terms and Conditions (GTC) for a certain project delivery system as the conditions are balanced for both the contracting authority and the tenderer in such GTC. In particular cases, it may be necessary to deviate from such GTC, but deviations should always be clearly motivated. Therefore clients in the public sector in the Netherlands are legally obliged to use the UAC 2012 and the UAC-IC 2005 for Design-Bid-Build and Design & Build projects respectively, unless they have a valid reason not to do so.

Selected standard forms of construction contract for this research

The focus of this research is on complex Design & Build infrastructure projects and the aim is to provide recommendations for such projects in the Netherlands. The UAC-IC 2005 will be researched and compared to two other standard forms of construction contract to see whether there are elements related to trust and the change management process which can be derived from these. The other two contracts were selected based on the year the contract was first published (for the case study it is necessary to have completed projects in which the contract is applied) and on the role that trust plays in the contract. First, the FIDIC's conditions of contract are selected, because these are known as very rigid contracts which are likely to lead to confrontations between client and contractor. FIDIC's conditions of contract have been used for many years now (first published in 1957) and are the most widely used standard international construction contracts. The standard form of construction contract for complex D&B projects is the FIDIC's Yellow book Conditions of Contract for Plant and Design & Build. Second, the NEC family of contracts is selected, because trust plays an important role in this contract and some clauses are specifically dedicated to this aspect. The NEC contracts are quickly emerging and widely adopted in the civil engineering sector, especially in the United Kingdom. These contracts are well known for encouraging an open, co-operative, no-blame, non-adversarial team approach. In 2005, the NEC3 contracts were endorsed by the UK Office of Government Commerce. The standard form of construction contract for complex D&B projects is the NEC3 Engineering and Construction Contract (ECC) (Potts, 2008, pp. 258-259, 247-248). With regard to trust, the UAC-IC 2005 seems to be somewhere in between these two contracts due to the legal provisions of reasonableness and fairness in the Dutch Civil Code.

4.5 Design-Bid-Build versus Design&Build

In the following section the difference between two project delivery systems: the 'traditional' Design-Bid-Build and the 'innovative' Design&Build is described. As Design&Build is increasingly used in the Netherlands for infrastructure projects, the focus of this research is on this system. Figure 16 gives an overview of the relationships in both systems, whereas Figure 17 shows the division of responsibilities in both systems.

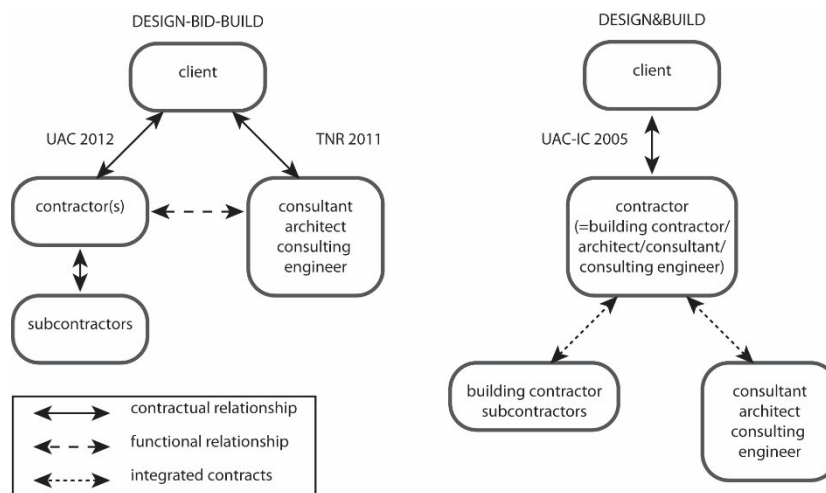


Figure 16: Overview of relationships in Design-Bid-Build and Design&Build (Chao-Duivis et al., 2013, pp. 51, 99)

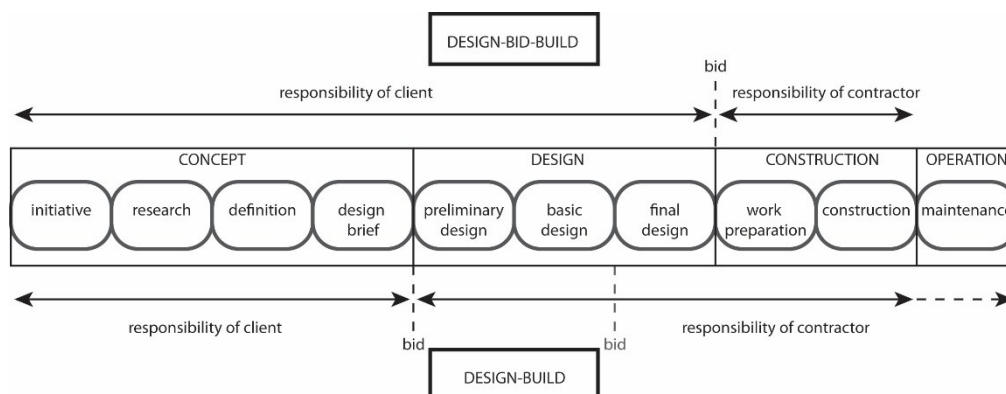


Figure 17: Division of responsibilities in Design-Bid-Build and Design&Build based on (CROW, 2005)

Design-Bid-Build

Traditionally, the Design-Bid-Build (DBB) project delivery system is often employed in the Netherlands for construction projects. In this system the client first enters into a contract with a consultant, an architect or a consulting engineer for the design of the project. In order to find a building contractor, procurement takes place based on the final design. The client enters into a contract with the winning tender for the execution of the design (Figure 16 and Figure 17). The standard form of contract which is most commonly used in Design-Bid-Build projects in the Netherlands is the UAC 2012. The UAC 2012 is used for the building contract, whereas DNR 2011 is used for the design contract. The designers and the contractor(s) do not have a contractual relationship, but merely have a functional one since the client is fully responsible for the design (Chao-Duivis et al., 2013, p. 51).

Design & Build

Table 88: Division of project delivery systems in the Dutch construction industry in 2011-2012 (Vrolijk & Holtackers, 2013, p. 15)

Project delivery system	2011	2012
	In %	In %
E&C	7	7
D&B	16	43
DBM	15	1
DBFM	6	0
Traditional/RAW/DBB	52	44
Other project delivery systems	3	6

Since a number of years the Design&Build (D&B) project delivery system is increasingly used in the Netherlands for construction projects (Table 88). The system is also known as Design & Construct (D&C) or Turnkey. In this system, the client only enters into one contract for both design and construction with a contractor, which could be a building contractor, an architect, a consultant, a consulting engineer or some other person. Such contracts are usually called integrated contracts since different tasks (i.e. design and build) are integrated in one contract. The client is free to choose how much design work he will be carrying out himself and how much will be done by the contractor. If the client

chooses only to include the engineering design in the contract, the project delivery system becomes Engineering & Construct (E&C). Moreover, the client is free to include Maintenance to the contract, as a result, the project delivery system becomes Design, Build, Maintain (DBM) (Figure 17). It is also possible to include Financing to the contract, so that it becomes DBFM, or to include Operation, so that it becomes Build-Operate-Transfer (BOT), but such systems require other or additional General Terms and Conditions (GTC). The contractor is allowed to bring in consultants, architects, engineers, subcontractors etc. to help with the design, the construction and the maintenance. The standard form of contract which is most commonly used in Design&Build projects in the Netherlands is the UAC-IC 2005. The UAC-IC 2005 are used for the contract between client and contractor, whereas other standard forms of contract are usually applied for the contracts between contractor and subcontractors, architects, engineers etc. (Chao-Duivis et al., 2013, pp. 51, 99-100).

Comparison DBB and D&B

Table 89 sums up the most important advantages and disadvantages D&B has over DBB for the client.

Table 89: Advantages and disadvantages D&B has over DBB for the client (Levy, 2006, p. 7; Potts, 2008, p. 144)

Advantages	Disadvantages
Early price and schedule certainty	Single point of responsibility for design and construction (and maintenance)
Less adversarial relationships	Reduced number of changes
Builder involved in design process	Direct lines of communication between designer and constructor
Faster project delivery	Varying amount of client design input can be allowed
Client needs less technical staff	Preparation of a clearly defined brief requires much time and expertise
	Changes after commencement are expensive

4.6 Straightforward versus complex projects

With regard to best construction project management practices there are basically two kinds of construction projects: straightforward and predictable projects (low complexity) and complex and unpredictable projects (high complexity) (Koppenjan, Veeneman, Van der Voort, Ten Heuvelhof, & Leijten, 2011, p. 743; Van Gunsteren, Binnekamp, & De Graaf, 2011, pp. 9-14). The predict-and-control approach (Type 1) is characterized by a strong focus on front-end analysis to overcome uncertainty and complexity, therefore this approach is best applicable to projects with low complexity. The prepare-and-commit approach (Type 2) is more applicable to projects with high complexity because this approach assumes that there are a lot of uncertainties, thus dealing with uncertainty and complexity is a constant and shared task during the project. Table 90 gives an overview of the main differences between these two management approaches. Project complexity can be subdivided into technical complexity, organizational complexity and complexity of the environment. Complexity is caused by, inter alia, uncertainties and risks (Bosch-Rekvelde, 2011, pp. 37-38 and references therein). Uncertainties and risks are closely related. Project risk is mostly defined as 'the probability of occurrence of a certain event' times 'the (financial) impact of the event'. The risks consists of a lot of uncertainties with regard to the events (e.g. which kind, the quantity), the predictability of the probability of occurrence of the events, and the predictability of the consequences of the events. Uncertain is not the same as unknown. The former means unforeseen, whereas the latter means not foreseeable (De Ridder, 2009, p. 42). This research will focus on complex and unpredictable projects since much more changes are expected in such projects and decision-making is more difficult due to the network of stakeholders.

Table 90: Best construction project management practices (Koppenjan et al., 2011, p. 743)

Aspect	Type I: predict-and-control	Type II: prepare-and-commit
Terms of Reference	Blueprint	Functional
Task definition	Narrow for best control	Broad for best cooperation
Contract	Task execution	Functional realization
Incentives	Work-task based	System-output based
Change	Limit as much as possible	Facilitate as much as needed
Steer	Hierarchical	Network
Information exchange	Limited, standardized	Open, unstructured
Interface management	Project management task	Shared task

5. The project context: Less involvement of the government as a client in the construction industry

The concept 'Less government' was introduced in the eighties in the Netherlands due to the economic crisis in 1982-1983 and has been pursued ever since by the central government. In the nineties, the American concept 'New public management' was also introduced in the Netherlands, according to this concept public organizations should focus on financial targets, efficiency and the customer. Consequences of the introduction of both concepts for the construction industry are the outsource of government services and the transformation of government organizations to agencies and independent administrative bodies (Metze, 2010, pp. 30, 257-258).

Reorganizations of government organizations in the infrastructure segment

The introduction of the two concepts has caused big changes in the infrastructure segment since for a large part this segment consists of public clients. Large national infrastructure projects are executed by Rijkswaterstaat (national roads and waterways) and ProRail (railways), whereas smaller regional and local projects are the responsibility of the provinces, municipalities and the water boards (CapAnalysis Group, 2002, p. 11; Vrolijk & Holtackers, 2013, p. 15).

Rijkswaterstaat (RWS) has initiated a new policy in 2004. Reasons for the change were the introduction of the concept 'Less government' by the central government, the administration was a big mess, there were hundreds of redundant civil servants, and the discovery of the construction fraud in 2002, which has led to distrust and a large distance between the client and the contractor. The past decade RWS is transforming its technocratic culture into a market and public oriented culture, as a result that the role of RWS is changing from a skillful technical specialist towards a strategic professional procurer (Metze, 2010; Vinke, 2013). The concepts "Outsource to market sector, unless..." and "More quality with less people" play an important role in the policy change (Rijkswaterstaat, 2004, pp. 16, 27, 12-13). Three aspects which are important in these two concepts are: centralization of tasks, standardization (introducing standard forms of contracts such as the UAC-IC 2005), and professionalization of the outsourcing or procurement (introducing integrated project delivery systems such as E&C, D&B and DBFM) (Metze, 2010, pp. 123-124). Ten years after the initiation of the new policy, RWS is outsourcing a lot to the market sector, whereby they use in principle DBFM for large projects (>100 million euros), D&B for medium-sized projects (10-100 million euros), and performance contracts for maintenance projects. RWS mainly applies the UAC-IC 2005 in their projects, and only uses the UAC 2012 if it is more applicable (Groot, Afrian, Hardeman, & Vrolijk, 2012, pp. 56-57; Rijkswaterstaat, 2014).

Local governments are still using the Design-Bid-Build project delivery system for many projects. In the past few years, a lot of municipalities (especially the larger ones) have gained experience in using integrated contracts though, but the application of such contracts is in a much less advanced stage than RWS. In the future, the municipalities will strive to save time on procurements by clustering projects and increasing the use of integrated contracts. The provinces occupy an intermediate position between RWS and the municipalities with regard to the application of integrated contracts. The provinces do not outsource all projects to the market, but they first check whether outsourcing has advantages over doing the work themselves. Therefore, the provinces still often use both UAC 2012 and UAC-IC 2005 (Groot et al., 2012, pp. 53-57).

Problems involved with the transition from DBB to D&B

This section gives an overview of the problems in the Dutch construction industry which have occurred the past few years and which are expected in the future.

Core problems when Design-Bid-Build was dominant

According to (Pishdad-Bozorgi & De la Garza, 2012, pp. 21-22) the Design-Bid-Build (DBB) project delivery system is known to give rise to adversarial relationships among project participants which are likely to result in litigations. The core problems which cause this undesirable situation are the linear and fragmented characteristics of DBB, the lack and/or failure of collaboration and communication among the parties, and the various means and methods used by the parties to shift risk to other project participants. These core problems are quite similar to the core problems which (Noorderhaven et al., 2006, pp. 22-31, 42-44) have found with their research of the Dutch construction industry in which DBB was dominant: the fragmentation in combination with the lack of coordination, and the strategies of the contractors which were focused on reducing competition. Distrust among project participants is the main cause of these two problems. Since the discovery of the construction fraud in 2002 there is a lot of distrust between client and contractor in Dutch construction projects. Reasons for this distrust are the construction fraud in which contractors made agreements with each other on tender prices and division of work and its aftermath which includes loss of reputation and fines, the use of Design-Bid-Build which does not offer possibilities for the contractor to gain trust, and the lack of transparency about both parties' intentions.

Fragmentation means that the tasks are divided over a lot of parties, which has advantages such as risk allocation and specialized workers, but fragmentation also requires a lot of coordination. Failure of collaboration applies to all parties involved in the project, and is the consequence of a lack of coordination. Frequent deficiencies in the coordination of construction projects are poor preparation of the building specifications, unilateral control (i.e. only controlling one aspect), and no clear central leadership (i.e. the common interest is subordinate to the individual interests). Failure of collaboration is related to aspects such as legal disputes, lack of communication, fear to have discussions, rigid rules and contracts in order to have control, lack of integration in the supply chain, inadequate utilization of innovative products, and inadequate utilization of the subcontractor's competences.

The strategies of the contractors were mainly focused on filling capacity and reducing competition by offering the lowest price, and not on improving their position by offering quality and innovation. Such strategies are closely related to claims and change orders due to design errors and omissions. In DBB reducing competition during procurement works as follows: the contractor strategically under-bids the basic contract in order to get the award and then tries to make up profit margins later in the project by generating claims and change orders (Runde & Sunayama, 1999, pp. 46-48).

Solved problems with D&B

The introduction of the D&B project delivery system has solved the two core problems of the DBB system to a large extent, but not completely. Firstly, in D&B there is much less fragmentation since one single party is responsible for both design and construction of the project. Since the designers and constructors are working as one team, the collaboration and communication between them enhances, and the division of responsibilities and accountabilities is clearer. Nevertheless, the lack of coordination and the failure of collaboration between client and contractor have not improved, and there is still a lot of distrust between these parties. Secondly, strategically under-bidding is eliminated to a large extent as the potential for change orders due to design errors and omissions is effectively minimized in D&B (Pishdad-Bozorgi & De la Garza, 2012, pp. 21-22). Thirdly, contractors are stimulated to offer quality and innovation by the new Dutch procurement law (Aanbestedingswet 2012) as it includes the principle "Apply EMAT criteria, unless...". EMAT is the abbreviation of Economically Most Advantageous Tender, which basically means that tenders are selected based on the combination of price and quality. According to the principle, clients are obliged to award on the EMAT criteria unless they can clearly motivate why it is better to procure solely on price.

New problems with D&B

The increasing use of integrated contracts in the infrastructure segment causes a culture change for both client and contractor, which has led to some new problems. Firstly, the client might not have enough technical knowledge anymore to, for example, prepare an appropriate brief and specifications or to check the contractor's work. The clients' side is transforming from a technocratic culture into a market and public oriented culture, whereas contractors' side also requires change since they are expected to take on more responsibilities and tasks such as design, finance, operation, and maintenance. For the client there is a mismatch between the knowledge its personnel has and the knowledge which is required for the new policy, therefore this change means an enormous outflow of technical knowledge and an inflow of management knowledge. Meanwhile, the contractor needs more people with technical knowledge. Thus, a shift of technical knowledge from client to contractor takes place. Secondly, the new policies which are associated with the two culture changes require a lot of time before they are completely implemented and well-functioning. Both culture changes are dependent on each other, which means that if the client changes, the contractor should change also. At this moment, RWS and ProRail are in quite an advanced stage with the application of integrated contracts, but the municipalities and the provinces are far behind. At the contractors' side, mainly the large construction companies in the Netherlands have taken action to change their policy, while the small companies are still working according to the traditional system. Since both problems are more or less organizational problems, these will not be chosen to be the main problems of this research, but it is very important to keep these in mind when switching from DBB to D&B.

Existing problem not solved and more severe with D&B

The focus of this research is on an existing problem which has become more severe with D&B. This problem is the ineffective and inefficient change management process (i.e. the negotiations on changes), which is part of the core problem lack of coordination/failure of collaboration. The main consequences of the problem of ineffectiveness and inefficiency are time and cost overruns of the project. The main cause of this problem is distrust between client and contractor due to the lack of transparency about both parties' intentions and the lack of sharing relevant information. According to contractors, clients are not to be trusted because they are fickle, change things continuously, and do not know what they want. Besides, clients often desire maximum benefit at minimum cost. The clients' perception of contractors is that they are mainly focused on maximizing their profit margin (Kleijn, Dols, Hoepel, & Talstra, 2014, pp. 66-67).

Effectiveness is an indicator of the degree of a goal attainment and can be determined by comparing the actual performance with the normative performance. Efficiency is an indicator of the resources that were consumed to reach the level of achievement and can be determined by comparing the actual efforts and the normative efforts (De Ridder, 2013, p. 19; Samsonowa, 2012, p. 25). On the one hand, negotiations on change orders are inefficient since these take a lot of time because client and contractor cannot come to an agreement on time and cost of the changes. Reasons for disagreement are for example, the contractor proposes excessive prices for the additional works, there is no room to maneuver for the parties (e.g. when representatives are instructed not to give in by upper management), and the client cannot easily get the money for the changes. In addition, negotiations on change orders are inefficient since these can result in cost growth of the project. Disagreements could lead to claims and subsequently to legal disputes in which some legally empowered body such as an arbitration panel or the courts give the final judgment. Cost growth due to claims against the client will be incurred in the project, and both parties will have additional costs due to promulgation of the dispute resolution process (Koch et al., 2010, pp. 192-193). On the other hand, negotiations on change orders are ineffective because of for example poor decision making which leads to grey compromises (suboptimal solutions about which none of the parties is enthusiastic), and limited possibilities to change due to already built works.

Compared to DBB the problem of the ineffective and inefficient change management process becomes more severe in D&B because the design phase and construction phase overlap to a large extent. Some important consequences of this overlap for change orders are that it is more difficult to estimate the value of the changes since the design is not 100% complete, the costs of changes increases much faster over time, the ability to change the design decreases much faster over time and there is a higher probability of disruptions in construction (ICE, 1996; Koch et al., 2010, p. 197).

6. Trust: Trust per cultural dimension

Masculinity versus Femininity (MAS)

'A society is called masculine when emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life. A society is called feminine when emotional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life' (Hofstede et al., 2010, p. 140). MAS is also called the performance-co-operation orientation index. With regard to trust, there are some essential differences between the two extremes. In performance-oriented cultures, parties do business with anyone, focus is on performance, trust implies enforceable trust (i.e. trust in good performance that is backed up by the option of rewarding and punishing the trustee), implicit trust is low and if you get cheated upon it is your own fault and you are a loser. Whereas in co-operation oriented cultures, building relationships is important, focus is on good intentions rather than on performance, trust implies intrinsic trust (i.e. trust that accepts vulnerability), implicit trust is high and cheaters are looked down upon (Hofstede et al., 2010, pp. 155, 170, 180; Verwaart, 2011, pp. 18, 90-91).

Table 91: Masculinity versus Femininity with regard to trust (Hofstede et al., 2010, pp. 155, 170, 180; Verwaart, 2011, pp. 18, 90-91)

Masculinity (=performance oriented)	Femininity (=co-operation oriented)
Do business with anyone Challenge, earnings, recognition, and advancement are important.	Build relationships Relationships and quality of life are important.
Rapid deals, as big as possible People place value on measurable performance criteria such as size, speed and quantity. Preference for larger organizations.	Take time to negotiate, accept small deals Good intentions are more important than good performance. Preference for smaller organizations
Be a tough negotiator Life is conceptualized as a series of contests and winning is paramount while losing is a disaster. Men should be assertive, ambitious, and tough.	Show mutual willingness to accommodate Both men and women should be modest.
Cheat and expect to be deceived Implicit trust is low and if you get cheated upon, it is your own fault and you are a loser.	Trust Implicit trust is high and cheaters are looked down upon.
Trust implies enforceable trust Trust in good performance that is backed up by the option of rewarding and punishing the trustee	Trust implies intrinsic trust Trust that accepts vulnerability
Trace and enforce delivery to contract If you do well, you also do it in a large way. If you commit crimes, they are large ones, not petty ones. Corrective society.	Avoid notorious deceivers Small-scale cheating occurs a lot because society is permissive, and punishments are low or, in the case of small misdemeanours, you may be forgiven.
Big is beautiful in everything.	Small is beautiful.
Management as manage: decisive and aggressive	Management as ménage: intuition and consensus
Resolution of conflicts by letting the strongest win	Resolution of conflicts by compromise and negotiation
Rewards are based on equity.	Rewards are based on equality.

Individualism versus Collectivism (IDV)

'Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after him or herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty' (Hofstede et al., 2010, p. 92). With regard to trust, there are some essential differences between the two extremes. In individualistic cultures, parties feel free to do business with any party, negotiate prior to the formation of a relationship, only pursue their own personal interests, depend on their personal judgment and will be more careful to trust, and show distrust as it is. The thresholds for opportunistic behaviour, trust and forgiveness are based on personal relations and the personal interests in these relations. Whereas in collectivistic cultures, parties prefer to do business with in-group members, form the relationship prior to the negotiations, pursue both their group's interests and their own personal interests, rely on social sanctioning systems and do not show distrust to in-group members. The thresholds for opportunistic behaviour, trust and forgiveness are based on group memberships and norms (Hofstede et al., 2010, pp. 113, 124, 130; Verwaart, 2011, pp. 19, 104-108).

Table 92: Individualism versus Collectivism with regard to trust (Hofstede et al., 2010, pp. 113, 124, 130; Verwaart, 2011, pp. 19, 104-108)

Individualism	Collectivism
Speaking one's mind is a characteristic of an honest person. Low-context, explicit communication prevails. Parties are not very modest in their negotiations, nor will they give in for the purpose of maintaining harmony.	Harmony should always be maintained and direct confrontations avoided. High-context, implicit communication prevails. During the negotiation, there is discrimination between in-group and out-group parties. To an in-group party, one is more modest (or realistic, following their in-group's rules), more hesitant to break off negotiations and more trying to maintain harmony as long as the opponent follows the in-group rules.
Treat all parties equally The same value standards are supposed to apply to everyone: universalism. Parties feel free to enter into negotiations on the basis of new proposals and take the initiative to propose to new business partners.	Show favor to in-group parties Value standards differ for in-groups and out-groups: exclusionism. Parties prefer to do business with in-group members, or will have to familiarize with out-group members before doing business. Parties do not take the initiative to propose to others than in-group members and existing business relations.
Task is more important than a good relationship Talk business before the relationship has been established and acknowledged. Mutual advantage is the basis of relationships.	No business without a personal relationship Negotiation has to be preceded by the formation of a relationship. If that goes wrong, there will be no negotiation. A relationship brings rights and obligations
Responsible for personal interests Use the word "I". Individual interests prevail over collective interests. A party only has his own personal interest in mind during negotiations	Responsible for group interests Use the word "we". Collective interests prevail over individual interests. A party will accept benefits for his in-group rather than his personal advantage as a convincing argument.
Build and maintain relationships actively	Relationships are given

Parties will value personal trust relationships, as these represent the social capital that they acquired by investments.	Parties are members of a group.
Terminate if progress is insufficient Parties are not particularly patient or impatient negotiators, but behave patiently as long as it serves their interest.	Do not terminate negotiations If an out-group party replies with no or small concession, negotiation is likely to be broken off, whereas an in-group party or an acquainted relation would get a second chance.
Show distrust as it is For example, parties will more easily accept the other party tracing their trustworthiness.	Do not show distrust to in-group members For example, parties will less easily accept the other party tracing their trustworthiness. Showing distrust does serious damage to relationships within the group.
Low relational endowment effect Individual trust is more relevant. Parties cannot rely on social sanctioning systems, so they depend on their personal judgment and will be more careful to trust.	High relational endowment effect Group trust is more relevant. Parties rely on social sanctioning systems. For the sake of maintaining harmony, parties show trust towards in-group parties, but also towards out-group parties when they have had long lasting relationships.
Deceive according to personal morality The thresholds for opportunistic behaviour, trust and forgiveness are based on personal relationships and the personal interests in these. Keep self-respect.	Deceive if it does not conflict with group interests The thresholds for opportunistic behaviour, trust and forgiveness are based on group memberships and norms. Save face for in-group.
The experience of previous deals counts more Be it personal experience or the experience of others (reputation). The weight of reputation compared to personal experience is less strong.	The acceptability of the other party and the estimate of their trustworthiness are primarily based on group membership. The experience of previous deals also counts, be it personal experience or the experience of others (reputation). The weight of reputation compared to personal experience is stronger.
The negative effect of revealed deceit is less strong. The other party's acceptability after revealed deceit will be determined by future interests, but of course, the estimate of the other party's trustworthiness is decreased.	The negative effect of revealed deceit is stronger. The deceived and their relations will exclude the deceivers and their relations from business for some time.
The employer-employee relationship is a contract between parties in a labor market.	The employer-employee relationship is basically moral, like a family link.
Everyone is expected to have a private opinion.	Opinions are predetermined by group membership.
Laws and rights are supposed to be the same for all.	Laws and rights differ by group.

Power Distance Index (PDI)

Power distance can be defined as 'the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally. Institutions are the basic elements of society, such as the family, the school, and the community; organizations are the places where people work' (Hofstede et al., 2010, p. 61). With regard to trust, there are some essential differences between the two extremes. In large power distance cultures, the powerful parties have privileges, the powerful dictate the negotiation conditions, parties treat all business partners and potential business partners unequally, parties are careful not to deceive more powerful parties, and there is no need to distrust less powerful parties. Whereas in small power distance cultures, all should have equal rights, parties will always negotiate, parties treat all business partners and potential business partners equally, decisions to deceive, trust, and forgive are not influenced by the other party's status, and trust is equally important in every relationship, regardless of the other party's status (Hofstede et al., 2010, pp. 72, 76, 83; Verwaart, 2011, pp. 19, 114, 118).

Table 93: Power Distance Index with regard to trust (Hofstede et al., 2010, pp. 72, 76, 83; Verwaart, 2011, pp. 19, 114-118)

Large power distance	Small power distance
Might prevails over right: whoever holds the power is right and good. Inequalities among people are expected and desired. The powerful should have privileges. Privileges and status symbols are normal and popular.	The use of power should be legitimate and follow criteria of good and evil. Inequalities among people should be minimized. All should have equal rights. Privileges and status symbols are frowned upon.
Less powerful parties should be dependent.	Less powerful parties and more powerful parties should be interdependent.
Formal speech; acknowledgement	Talk freely in any context
Dictate, obey Parties are not used to negotiating seriously. The powerful dictate the conditions. The less powerful have to accept.	Negotiate Parties may have different ways to negotiate, but they will always negotiate.
Negotiate only in case of equal power Parties expect a lower ranked business partner to accept their conditions rapidly. When people from hierarchical cultures are forced to negotiate, because they are in a position of equal status or trade with foreigners, the negotiations often end in a game of power.	Negotiate A party will not give in to the pressure if his status is lower, but will either react furiously (e.g., break off negotiations) or simply ignore the pressure (make a counterproposal), in which case the opponent will be furious (and e.g. break off negotiations).
Prefer equal status business partners Although one can exploit status in doing business with less powerful counterparts, higher ranked parties prefer to do business with partners of their own level of power, because it would lower their status to get involved with people below their own standing.	Treat all business partners and potential business partners equally Status plays no role in partner selection. There are people who are labeled to have a high or low status in some respect like business, show business, politics, or sports. In strictly egalitarian societies, this will not influence the behaviour of business partners.
Avoid more powerful business partners, but show favor when unavoidable Parties will try to avoid partners who have higher status than they have themselves, because the higher ranked have the power to dictate business conditions. Parties will never propose business to higher ranked others because they are afraid of getting a bad deal.	
Be patient and conceding with powerful partners If lower ranked parties receive a proposal from a higher ranked trader they have to accept and the only thing they can do is plead and hope for magnanimity.	
Be careful not to deceive more powerful parties. The lower ranked will not easily consider to defect and will usually comply when doing business with higher ranked and will only defect if in need. The higher ranked do not have to fear for repercussions when doing business with lower ranked opponents, so the decision whether to defect or not	Decisions to deceive, trust, and forgive are not influenced by the other party's status. Instead, they depend on the quality of the relationships they want to maintain and the sanctions they may expect.

merely depends on their morality, relationship, personality and/or circumstances.	
Do not show distrust to more powerful parties The acceptability of business partners does not depend on experience in previous deals: the lower ranked have no choice but to accept business conditions and to show truthful and trusting behaviour, whatever experience they have and whatever the reputations of their opponents are. Therefore, a lower ranked party may have a belief about the fairness and trustworthiness of a higher ranked party, but cannot show distrust. However, he may avoid a powerful party that he believes to be unfair or untrustworthy.	The experience of previous deals counts with regard to the acceptability of business partners. Be it personal experience or the experience of others (reputation). Failed negotiations decrease a partner's future acceptability and negotiations resulting in an agreement increase it.
No need to distrust less powerful parties The lower ranked have no choice but to show trust in the higher ranked, whatever belief about their trustworthiness they may have. The higher ranked have no reason to distrust the lower ranked, because they assume that deceit of a higher ranked would not even be considered.	Trust is equally important in every relationship, regardless of the other party's status. Decisions to trust a delivery or to request a trace (thus showing distrust) are not influenced by status difference. However, showing distrust may be harmful for relationships, so there may be other incentives for benevolent behaviour, but those incentives are not related to the dimension of power distance.
Hierarchy in organizations reflects existential inequality between higher and lower levels.	Hierarchy in organizations means an inequality of roles, established for convenience.
There are more supervisory personnel.	There are fewer supervisory personnel.
Managers rely on superiors and on formal rules.	Managers rely on their own experience and on subordinates.
Subordinates expect to be told what to do.	Subordinates expect to be consulted.

Uncertainty Avoidance Index (UAI)

Uncertainty avoidance can be defined as 'the extent to which the members of a culture feel threatened by ambiguous or unknown situations. This feeling is, among other manifestations, expressed through nervous stress and in a need for predictability: a need for written and unwritten rules' (Hofstede et al., 2010, p. 191). With regard to trust, there are some essential differences between the two extremes. In uncertainty avoiding cultures, parties express their emotions and aggression, only take known risks, need rules to trust, are hesitant to do business with new partners and do not trust them, and have a low deceit threshold towards strangers. Whereas in uncertainty tolerant cultures, parties suppress their emotions and aggression, are willing to take unknown risks, do not need rules to trust, are not hesitant to do business with new partners and do not particularly distrust them, and may be tempted to do deceit in order to make extra profit (Hofstede et al., 2010, pp. 203, 208, 217, 223; Verwaart, 2011, pp. 20, 132-135).

Table 94: Uncertainty Avoidance Index with regard to trust (Hofstede et al., 2010, pp. 203, 208, 217, 223; Verwaart, 2011, pp. 20, 132-135)

Uncertainty avoiding	Uncertainty tolerant
The uncertainty inherent in life is a continuous threat that must be fought.	Uncertainty is a normal feature of life, and each day is accepted as it comes.
Inner urge to be busy	Being busy is not a value per se
Expression of emotions and aggression; strong emotions when deceit is revealed Parties tend to be modest in the sense that it is a price they think is right and have an emotional style of negotiation, making sure that the opponents understand their feelings. After business partners have come to trust, any unexpected revelation of deceit provokes furious reactions and a party will not easily do business again with a partner that abused his trust.	Suppression of emotions and aggression Parties do not show their emotions and may be disconcerted if their opponents do. They are careful not to be more yielding than their counterparts are, not especially modest, and are ready to break off negotiations in case of insufficient progress. Revealed deceit will of course reduce trust and increase the frequency of tracing.
Only known risks are taken The main concern of parties is not to be deceived. They are willing to pay a price for certainty. A low estimate of trustworthiness of the other party does not hinder a transaction. If the uncertainty avoiding know what to expect, they arm themselves and enter only into contracts with sufficient securities. Once, in the course of repeated transactions, sufficient evidence for trustworthiness has been found through tracing of deliveries, and partners have become familiar, the uncertainty avoiding will come to trust their partners and expect them to follow the rules like they do themselves.	Willingness to take unknown risks Parties opportunistically do business in anything that brings them a profit and have a neutral risk attitude.
Conservatism, law and order, distrust and strong endowment effect There is an emotional need for rules, even if they will not work. Parties do not expect the rules to be broken and will trust, unless they are dealing with a stranger. A new partner will be distrusted until sufficient evidence for the contrary has been found.	Liberalism, openness to change and innovation There should be no more rules than strictly necessary. The other cultural dimensions determine the level of trust. The rules and contracts do not have a value per se.
What is different is dangerous	What is different is curious
Avoid strangers (xenophobia) Parties have a high threshold for entering into new relationships. They feel uncomfortable proposing to parties they did not deal with before. Parties need some external justification (group membership or reputation) for doing business with new partners. The new partners will not be trusted, but a low estimate of trustworthiness does not hinder a transaction. In addition, they prefer to do business with counterparts having equal status.	Tolerance of diversity Parties will not hesitate to propose or enter negotiations with strangers, if for some reason dealing with familiar relations is inconvenient. Parties increase the partner's future acceptability if negotiations result in an agreement, and decrease it if negotiations fail. Parties are not particularly distrusting, and trust will develop through repeated transactions. They will trace now and then, with decreasing frequency as trust develops.
Need for clarity and structure	Comfortable with ambiguity and chaos
Appeal of purity, high quality	Appeal of novelty and convenience
Impatient, time is money Parties will not adapt their behaviour to their opponent's. In the bargaining that follows they will not easily give in nor will much time be spent. After a few unsuccessful iterations, parties will break off the negotiation.	Relaxed negotiation style Parties try to adapt their behaviour to their counterparty's, although they are not prepared to come to an agreement at all cost. Time is a framework for orientation.
Low deceit threshold toward strangers Parties may have a lot of rules and contracts that forbid defecting, but that does not mean that they will follow the rules. Depending on the other cultural dimensions, Parties may just as easily or even more defect than	Frequency of deceit depends on relationships Parties may be tempted to do deceit in order to make extra profit, calculating the risk of being exposed as a deceiver and the damage that would do to their reputation and future co-operations.

uncertainty tolerant parties, especially when dealing with out-group partners.	
Focus on decision content	Focus on decision process
Many and precise laws or unwritten rules	Few and general laws or unwritten rules

Long-Term Orientation versus Short-Term Normative Orientation (LTO)

‘Long-term orientation stands for the fostering of virtues oriented toward future rewards—in particular, perseverance and thrift. Its opposite pole, short-term orientation, stands for the fostering of virtues related to the past and present—in particular, respect for tradition, preservation of “face,” and fulfilling social obligations’ (Hofstede et al., 2010, p. 239). With regard to trust, there are some essential differences between the two extremes. In long-term oriented cultures, parties will not put a relationship with a business partner at stake by deceiving, value their relationships, focus on building a strong market position, and avoid the risk of damaging their relationships. Whereas in short-term oriented cultures, parties may be tempted to do deceit in order to make extra profit, tend to grab a chance for an easy profit and are willing to put their relationships at stake for it, focus on transaction bottom line and quick profits, and are more opportunistic and analyze a deal in terms of pay-off rather than a relational network (Hofstede et al., 2010, pp. 243, 251; Verwaart, 2011, pp. 21, 147-150).

Table 95: Long-Term Orientation versus Short-Term Normative Orientation with regard to trust (Hofstede et al., 2010, pp. 243, 251; Verwaart, 2011, pp. 21, 147-150)

Long-term orientation	Short-term normative orientation
Deferred gratification of needs accepted Parties will not put a relationship with a business partner at stake by deceiving.	Immediate gratification of needs expected Given the opportunity (and depending on other preferences), parties may be tempted to do deceit in order to make extra profit, after calculating the possible gain.
Traditions adaptable to changed circumstances Long-term virtues taught: frugality, perseverance Parties value their relationships. They value a deal not only by the financial pay off, but also by the relational gains. They invest in relationships by behaving truthfully and by trusting their partners. They have no respect for others that put their relationships at stake for some short-term profit. If they turn out to be deceived by a business partner, they will not easily forgive the deceiver.	Traditions are sacrosanct Short-term virtues taught: social consumption Parties tend to grab a chance for an easy profit and are willing to put their relationships at stake for it (the other cultural dimensions, personality and circumstances determine the extent to which they will actually defect). They can understand that a business partner may be tempted to defect if a profitable opportunity occurs, and they have trouble understanding that people from long term oriented cultures cannot.
Saving, investing, patient Parties show patience. They do not break off negotiations. They do not overcharge. A first proposal may be modest, but they do not rapidly give in.	Spending, top quality demanded, impatient Extremely short-term parties are impatient. They want rapid deals. If they give in, they do it quickly and with substantial concessions. If partners do not make concessions too, they break off easily and try their luck elsewhere.
Building a strong market position Importance of profits ten years from now. Parties do not easily trust new relations. Trust has to be earned. They deliver truthfully and demand equal seriousness from their business partners. Once relationships have developed, they may signal their valuation of the relationships by showing trust. When they find out that their trust has been abused, they lose all respect and banish the partner from business.	The transaction bottom line, quick profits Importance of this year's profits. Parties trust or distrust on the basis of calculated risk and preferences, but the scope of their calculations is no more than the bottom line of the current transaction.
Invest in long-term relations Parties aim to develop lifetime relationships. Not only a transaction's calculated pay-off counts; the resulting relationship is of value by itself. Given the choice, a long-term oriented party would not neglect a proposal from a known relation in order to make a one more attractive one-time deal with a stranger.	Show off, by trading with high status partners Parties are not interested to develop long lasting relationships. They want to make attractive deals as soon as possible. Their preferences in partner selection depend on other cultural dimensions, but they may be interested in doing business with high status partners to show off.
Synthetic thinking Parties will follow a thrifty strategy. They avoid the risk of damaging their relationships. Even if they like to gamble, they will not do it in business. They invest in relationships and will not defect.	Analytical thinking Parties are more opportunistic. They analyze a deal in terms of pay-off (which may include future prospects), rather than a relational network. More than the long term oriented, and depending on other cultural dimensions, they like to show off and are prepared to take risks if this is necessary to save face and meet social demands.
Main work values include learning, honesty, adaptiveness, accountability, and self-discipline.	Main work values include freedom, rights, achievement, and thinking for oneself.
Owner-managers and workers share the same aspirations.	Managers and workers are psychologically in two camps.
Investment in lifelong personal networks, guanxi	Personal loyalties vary with business needs.

Indulgence versus Restraint (IND)

‘Indulgence stands for a tendency to allow relatively free gratification of basic and natural human desires related to enjoying life and having fun. Its opposite pole, restraint, reflects a conviction that such gratification needs to be curbed and regulated by strict social norms’ (Hofstede et al., 2010, p. 281). With regard to trust, there are some essential differences between the two extremes. In indulgent cultures, parties have a perception of personal life control, have less moral discipline, and have a positive attitude. Whereas in restrained cultures, parties have a perception of helplessness, have moral discipline and have a cynical attitude (Hofstede et al., 2010, pp. 291, 297).

Table 96: Indulgence versus Restraint with regard to trust (Hofstede et al., 2010, pp. 291, 297)

Indulgence	Restraint
A perception of personal life control	A perception of helplessness: what happens to me is not my own doing.
Higher importance of having friends	Lower importance of having friends
Less moral discipline	Moral discipline
Positive attitude	Cynicism
Higher optimism	More pessimism
Smiling as a norm	Smiling as suspect

7. Trust: Components for building trust

The following tables summarize and compare five different sources with regard to components of trust. These components consist of (joint) activities and processes that build and sustain trust. The components which are more or less similar are placed on the same row. The exclamation mark in the first column indicates that similar components are found in the different sources which need to be taken into account. Components which build initial trust are distinguished from components which sustain trust during execution.

	(Wong et al., 2008)	(Khalfan et al., 2007)	(Kadefors, 2004)	(Jin & Yng Ling, 2005)	(Wang & Yin, 2013)
BUILDING INITIAL TRUST	! Knowledge to reveal the consistency, competence and integrity of the individual or organization	The organization's financial position		- Seek partner with good record of collaboration experience - Establish good relationship with local partners (also during execution) - Appoint staff with interpersonal skills (also during execution) - Empower staff with authority (also during execution) - Gain support of top management (also during execution)	The organization's reputation and competence of financial and risk management
	! Clear organizational policy in achieving organizational goals	The organization's culture/policy	Social and organizational norms	Seek partner with similar culture	- Organizational policy - Compatibility
	!	Shared goals (=joint understanding of the roles and aims of project work)	Joint goal setting (cost, time, quality, relations and work processes) by initial team-building workshops	- Adhere to mutual goals and objectives (also during execution) - Hold formal workshops for relationship building (also during execution)	Common objectives
	! Clearly defined system of communication procedures and approaches			Maintain efficient communication (also during execution)	Clear and effective communication system
	!		Agreed systems for conflict resolution	Adopt joint problem solving philosophy	Adopt Alternative Dispute Resolution (ADR) to seek win/win resolution
	! Contracts and agreements reduce uncertainties, minimize, share or shift risks among contracting parties	The contract form, equitable contract and distinction between formal and informal agreements in the relationship		- Draft a clear and unambiguous contract - Adhere to defined roles and responsibilities (also during execution)	Contract clause design: e.g. equitable risk allocation
	!		Agreed systems for achieving continuous improvement	Implement a progress evaluation system (also during execution)	
			Economic incentives for cooperation (e.g. risk and reward schemes to encourage open information sharing and perceptions of relative equity)		
				Involve the contractor is the project early	

	(Wong et al., 2008)	(Khalfan et al., 2007)	(Kadefors, 2004)	(Jin & Yng Ling, 2005)	(Wang & Yin, 2013)
SUSTAINING TRUST DURING EXECUTION	! Communication/interaction to impart or exchange information between individuals or organizations	Repeated fulfilment of communications through action and outcome (=gain experience by working together)		Maintain efficient communication	
	!	Problem-solving by mutual satisfaction at point of the problem, rather than referring to superiors or the contract			Friendly resolution of disputes due to engineering changes and claims
	! Emotional investments to reduce defensiveness, unhealthy competitiveness and disruption, to eliminate frictions and to enhance team spirit and morale in the working relationship		Formalized team building workshops	Hold formal workshops for relationship building	Emotional investments to understand the feelings of the other parties
	! Being thoughtful to eliminate unfavourable attitudes and to raise kind awareness of other people's feelings	Reasonable behaviour (=working fairly and professionally with the people in the project team)			
		Reciprocity (=team members supporting and rewarding each other's trusting behaviour)			
				Cultivate learning climate	

8. Trust: Maturity model for relationships in construction (Meng et al., 2011)

Main criteria	Sub criteria	Level 1: Price competition	Level 2: Quality competition	Level 3: Project partnering	Level 4: Strategic partnering/ alliance
Procurement	Selection criteria	The lowest price	Cost and quality	Multi-criteria from short-term perspective	Multi-criteria from long-term perspective
	Procurement route	Single-stage tendering	Two-stage tendering	Negotiation or tendering	Direct negotiation
	Form of contract	JCT	JCT/NEC	NEC/PPC 2000/JCT CE	MEC/TPC 2005/JCT CE/ Bespoke contract
Objectives	Objectives alignment	Only self-objectives	Mainly self-objectives	Mutual objectives in a project	Mutual objectives in the long-term
	Benefits	Win-Lose	Win-Partial win	Win-Win in a single project	Win-Win in the long-term
	Continuity of work	No continuity of work	Prospect of future work through tendering	Preferred suppliers	Guarantee for future work
Trust	Type of trust	Contractual trust	Competence trust	Short-term goodwill trust	Long-term goodwill trust
	Confidence in others' behaviour	Little confidence	Some confidence	Much confidence	Full confidence
	Monitoring others' work	Checking and double checking	Checking somewhat reduced	Checking greatly reduced	Checking almost unnecessary
Collaboration	Working relationship	Confrontation or arm's length	Limited cooperation	Collaboration	Close collaboration
	Culture	Mutual blame	Self defence	Abandon of blame culture	Problem solving focused culture
	Mutual help	No support for the weaker	Support only with the issues related to self-interest	Often support for a weak partner	Always support for a weak partner
Communication	Information exchange	Little information is exchanged openly	Some information is exchanged openly	Much information is exchanged openly	Most information is exchanged openly
	Sharing learning	No sharing learning and innovation	Little sharing learning and innovation	Sharing learning and innovation	Continuous sharing learning and innovation
	Cost data transparency	No cost transparency	Little cost transparency	Open book costing between two parties	Open book costing throughout the whole chain
Problem solving	Early warning	No risk identification, no early warning	Informal risk identification, no early warning	Early warning between two parties	Early warning throughout the whole chain
	Effectiveness	Problems often lead to disputes	Problems sometimes lead to disputes	Many problems are timely resolved at the lowest level	Most problems are timely resolved at the lowest level
	Avoidance of recurrence	Problems often recur	Sometimes problems recur	Few problems are repeated	Rare problems are repeated
Risk allocation	Risk sharing	No risk sharing	Limited risk sharing	Risk sharing greatly increased	Common practice for risk sharing
	Allocation principle	Risk is always allocated to the weak party	Risk is often allocated to the weak party	Risk is allocated to the party best able to manage it in a project	Risk is allocated to the party best able to manage it in the long-term
	Balance of risk and reward	No rewards for the party taking the risk	Some rewards for the party taking the risk	Often appropriate rewards for the party taking the risk	Always appropriate rewards for the party taking the risk
Continuous improvement	Joint effort	No joint effort for improvement	Limited joint effort for improvement	Joint effort for better ways of working	Continuous effort for better ways of working
	Performance measurement and feedback	No common measures; No formal feedback	Limited common measures; Irregular but formal feedback	Common measures; Regular and formal feedback in a project	Common measures; Formal, regular and continuous feedback
	Incentives	No incentive	Informal incentive	Single incentive	Multiple incentives

9. Trust: Customized maturity model for relationships in construction adapted from (Meng et al., 2011)

Criteria	Topic	Sub Topic	Level 1 Low trust relationship	Level 2 Confident trust relationship	Level 3 High/strong trust relationship	Level 4 Complete trust relationship
(1) (2)	TRUSTWORTHINESS DURING PROCUREMENT	Selection criteria	The lowest price	Cost and quality	Multi-criteria from short-term perspective	Multi-criteria from long-term perspective
		Procurement route	Single-stage tendering	Two-stage tendering	Negotiation or tendering	Direct negotiation
		Type of trust	Contractual trust	Competence trust	Short-term goodwill trust	Long-term goodwill trust
(3)	OBJECTIVES	Objectives alignment	Only self-objectives	Mainly self-objectives	Mutual objectives in a project	Mutual objectives in the long-term
		Benefits	Win-Lose	Win-Partial win	Win-Win in a single project	Win-Win in the long- term
(4)	COMMUNICATION SYSTEM	Strategy	There may be an agreed project wide communication strategy, but it is not implemented effectively.	There is a project wide communication strategy, involving agreed systems to be used.	Communication strategy is agreed at the beginning of the project. Communication systems are put in place.	The communication systems provide good process transparency. Good communication makes positive impact on other aspects of the project.
		Method	Communication is done using multiple methods, such as letter, phone, e-mails, fax etc.	Multiple communication methods are still used for different purposes. There is no central repository.	IT based systems are used to provide a central hub for project information exchange.	-
(5)	PROBLEM SOLVING SYSTEM	Early warning	No risk identification, no early warning	Informal risk identification, no early warning	Early warning between two parties	Early warning throughout the whole chain
		Working relationship	Confrontation or arm's length	Limited cooperation	Collaboration	Close collaboration
		Mutual help	No support for the weaker	Support only with the issues related to self- interest	Often support for a weak partner	Always support for a weak partner
(6)	RISK ALLOCATION	Risk sharing	No risk sharing	Limited risk sharing	Risk sharing greatly increased	Common practice for risk sharing
		Allocation principle	Risk is always allocated to the weak party	Risk is often allocated to the weak party	Risk is allocated to the party best able to manage it in a project	Risk is allocated to the party best able to manage it in the long- term
		Balance of risk and reward	No rewards for the party taking the risk	Some rewards for the party taking the risk	Often appropriate rewards for the party taking the risk	Always appropriate rewards for the party taking the risk
(7)	CONTINUOUS IMPROVEMENT SYSTEM	Performance measurement and feedback	No common measures; No formal feedback	Limited common measures; Irregular but formal feedback	Common measures; Regular and formal feedback in a project	Common measures; Formal, regular and continuous feedback
(8)	TRUSTWORTHINESS DURING PROJECT	Confidence in others' behaviour	Little confidence	Some confidence	Much confidence	Full confidence
		Culture	Mutual blame	Self defence	Abandon of blame culture	Problem solving focused culture
		Working relationship	Confrontation or arm's length	Limited cooperation	Collaboration	Close collaboration
(9)	COMMUNICATION DURING PROJECT	Information exchange	Little information is exchanged openly	Some information is exchanged openly	Much information is exchanged openly	Most information is exchanged openly
(10)	PROBLEM SOLVING DURING PROJECT	Effectiveness	Problems often lead to disputes	Problems sometimes lead to disputes	Many problems are timely resolved at the lowest level	Most problems are timely resolved at the lowest level
(11)	CONTINUOUS IMPROVEMENT DURING PROJECT	Joint effort	No joint effort for improvement	Limited joint effort for improvement	Joint effort for better ways of working	Continuous effort for better ways of working
		Sharing learning	No sharing learning and innovation	Little sharing learning and innovation	Sharing learning and innovation	Continuous sharing learning and innovation
		Incentives	No incentive	Informal incentive	Single incentive	Multiple incentives

10. CM: Causes of changes

Level 1	Level 2	Level 3
		(Sun & Meng, 2009, p. 567) (Keane et al., 2010, p. 91 and references therein) (Pishdad-Bozorgi & De la Garza, 2012, pp. 24-30 and references therein)
External causes	Environmental factors	Conservation restrictions
		Weather conditions (wind, temperature, rain, etc.)
		Natural disaster (flood, earthquake, etc.)
		Geological conditions
		Unforeseen ground conditions
	Political factors	Weather conditions
		Conditions beyond the control of either the contractor or the owner
		Unforeseen problems
		Unknown or concealed conditions that affect the extent of the work
		Changes in government policies (environmental protection, sustainability, waste recycle, brown field use, etc.)
	Social factors	Changes in legislations on employment and working conditions
		Safety considerations
		Delays in planning permission approval
		Demography change and its impact on labour demand and supply
		Skill shortage on certain trades
	Economic factors	Opposition of neighbouring community
		Sociocultural factors
		Economic development cycle and its impact on demand
		Inflation impact on material, equipment and labour price fluctuation
		Change in economic conditions
Organisational causes	Process related	Market competition
		New materials
		New construction methods
	People related	Technology complexity
		Organization business strategy
		Business procedures, including payment practice
	Technology related	Quality Assurance procedures
		Competence and skills
		Culture and ethics
		IT and communication systems
		Technical supports

Level 1	Level 2	Level 3		
		(Sun & Meng, 2009, p. 567)	(Keane et al., 2010, p. 91 and references therein)	(Pishdad-Bozorgi & De la Garza, 2012, p. 24 and references therein)
Project internal causes	Client generated	Requirement change and variation	Change of plans or scope Change in specifications by owner Inadequate project objectives	Change of requirements or scope
		Funding change i.e. shortage of funding	Owner's financial problems	
		Slow decision making	Impediment of prompt decision making process Obstinate nature of owner	
		Payment delays		
		Difficulty in site acquisition		
			Replacement of materials or procedures	
			Insufficient planning at the project definition stage or lack of involvement of the owner in the design phase	
	Design consultant generated	Poor, incomplete drawings	Poor working drawing details Poor knowledge of available materials Poor design Ambiguous design details	Ambiguities within the drawings and/or specifications
		Design changes due to poor brief, errors and omissions	Change in design Errors and omissions Change in specifications Lack of required data	Errors and omissions
		Inconsistent site conditions		
			Conflicts among contract documents Poor coordination	
			Technology change	
			Value engineering	
			Design complexity	
	Contractor or subcontractor generated	Poor project plan/schedule	Lack of strategic planning	
		Poor site/project management skills	Skills shortage Lack of experience Lack of communication	
		Delays in appointing subcontractor		
		Delay of subcontractors' work		
		Poor workmanship	Poor workmanship	Non-conforming work
		Low productivity		
		Poor logistic control	Unavailability of Equipment Lack of involvement in design Financial problems	
			Desired profitability	
			Differing site conditions	Differing site conditions
			Fast-track construction	
			Poor procurement process Long-lead procurement	
			Complex design and technology	
	Contract generated			Misinterpretation/misunderstanding of the specifications
				Misunderstanding or differences of opinions with respect to the evaluation of the performance requirements of the delivered project
	Others	Poor interdisciplinary communication		Miscommunication between contractor and designer
		Team instability i.e. disputes, bankruptcy, etc.		
		Inappropriate project organisational structure		

11. CM: Effects of changes

Level 1	Level 2	Level 3 (Sun & Meng, 2009, p. 569) (Keane et al., 2010, p. 92 and references therein)	
Time effect	Time extension	Addition of work	
		Deletion of work	
		Rework/redesign	Rework and demolition
		Work duration extension	Completion schedule delay
	Loss of productivity	Productivity degradation	
		Procurement delays	Procurement delay
		Logistic delays	Logistic delay
		Unbalanced rhythm	
	Increased risk	Acceleration measures	
		Interruption of flow of work	
		Loss of float	
		Increased sensitivity to further delays	
	Payments		Delay in payment
Cost effect	Direct cost increase	Waste on abandoned work	
		Demolition costs	Rework and demolition
		Increase in overheads	Increase in overhead expenses
		Additional equipment and materials	
		Additional payment to contractors	Additional payment for contractor
	Indirect cost increase	Interrupted cash flow	
		Increased retention/contingency sum	
		Overtime costs	
		Litigation costs	
Relationship and people effect	Relationship related	Claim and dispute	Dispute among professionals
		Arbitration and litigation	
		Team change	
		Poor co-ordination	
			Poor professional relations
	Working conditions	Revision to work method	
		Site congestion	
		Poor safety conditions	Poor safety conditions
	Staff related	Loss of learning curve	
		Lower morale	
		Staff turnover	
	Quality	Quality degradation	Quality degradation
		Damage to reputation	Tarnish firm's reputation
Other effect	Progress		Progress affected without delay

12. CM: Components in the change management procedure

The following tables summarize and compare the components of five different change management systems. These components consist of (joint) activities and processes that build and sustain effective change management. The components which are more or less similar are placed on the same row. The exclamation mark in the first column indicates that similar components are found in different change management systems which need to be taken into account. The five or six principles of the change management systems are quite similar, but are named differently. In general, these principles are: 1) anticipate change, 2) recognize change, 3) evaluate change, 4) resolve change, 5) monitor implementation and 6) learn from change. The first and the last principle have a great influence on the efficiency of the system, whereas the other principles have a great influence on the effectiveness of the system.

	(Ibbs et al., 2001)	(Lazarus et al., 2001)	(Sun et al., 2006)	(Arain & Pheng, 2007)	(Egan et al., 2012)
1	Promote a balanced change culture	Promote a balanced change culture	Start up	Identify variation for promoting balanced variation culture	Address potential changes in the contract documents
!	Establish/communicate project goals and objectives		Team building		
	Establish/communicate baseline scope, cost and schedule				
!	Establish/communicate roles and responsibility	- Agree how changes will be valued - Agree change management procedures including time scales and approval processes - Promote and open communications environment	- Clarification of roles and responsibilities - Agreeing on change management procedures and processes		Include well-defined change management and dispute resolution processes in the contract
!	Establish/communicate project philosophy (risk allocation, type of changes and quick processing)	- Agree risk allocation within the project team - Agree what merits recording as change			
	Adapt existing change control for existing project				
!	Identify areas where changes likely occur	Improve the project team's understanding of the likelihood of change occurring by adopting risk management	Set up a change dependency framework to consider the change causes, effects and project characteristics in greater detail	- Identify the nature of variation - Identify the need for variation	
		Encourage change during design development before the project proposals are fixed			

	(ibbs et al., 2001)	(Lazarus et al., 2001)	(Sun et al., 2006)	(Arain & Pheng, 2007)	(Egan et al., 2012)
2	Recognize change	Identify change	Identification and evaluation	Recognize change	Identify the potential change, and create a proposed change order and document the proposed change
!	Identify potential change	- Project discussions to revise proposals should be acknowledged as changes to either the baseline or fixed elements of the project - Recognize that a change is being considered/is being made and initiate the change management process	Identify potential changes at the earliest opportunity by considering whether any of the potential change causes are present at a certain stage of a project	Identify and communicate the potential change to the team in a structured way	- Identify a potential change and correctly classify the type of change according to the contract documents - Early identification is beneficial
!	Assess potential impacts	Use value management and value engineering processes to manage elective changes	Apply the change prediction tool to predict change events and to enable appropriate actions to be taken in order to minimize disruptive effects	- Determine basis for variation (justification, schedule and cost) - Determine frequency of occurrence of variation	Create a proposed change order
!	Post potential change to log				Document the proposed change in a log
3	Evaluate change	Review, evaluate and approve the change	Approval	Conduct the diagnosis	Review and evaluate the proposed change order timely
!	Determine priority of the change			- Determine the nature of variation - Determine frequency of occurrence of variation	
!	Collect data on change options	Limited time scale to report upon change options, change methodologies and impacts	Selection of optimum change options		Reviews and adjustments of the proposed change order by all relevant parties
!	Identify impacts		Use the change prediction tool to assess the likely impact of different change options	Diagnosis of impact of variation	- Assess the impact of the change - Evaluate the contractor's entitlement to recover additional costs or time
	Determine final funding source				
!	Make the decision to approve the change or not	- Involve all affected parties - Include decision makers from client who have the authority to act - Prompt decision making as to whether to accept/reject the change or request further urgent investigations - Approval must be given with due authority	Approval by appropriate member of the team		

	(ibbs et al., 2001)	(Lazarus et al., 2001)	(Sun et al., 2006)	(Arain & Pheng, 2007)	(Egan et al., 2012)
4	Implement change	Implement change	Implementation	Implementation of variation	Execute the change order
!	- Implement change - Communicate final change decision	All the project team members should be aware of current project information	- Communicate change to all team members whose work is affected by it and adjust schedule of work - Apply the workflow tool to control construction processes, to coordinate project members, and to control construction information	Communicate to all parties and share database for prompt decision	Negotiations between the parties in an attempt to execute the change
!	Document authorization	Appropriate documentation must be used to record all decisions within the change process and provide an auditable trail		Record implementation	Create a change order if the parties can agree to the terms of the change
5	Implement change			Implementation of controlling strategies	
				Select controlling strategies	
!	Monitor implementation			Record implementation	
6	Continuously improve from lessons learned	Continuous improvement	Review	Learning form past experiences	Document the executed change
!	- Perform root cause evaluation - Prepare lessons learned throughout project life cycle	Undertake a project review	Review and learn lessons from the change event	Create lessons learned	
!	- Update databases project and corporate - Compare results to initial objectives - Incorporate lessons learned project and corporate	Feedback the results by revision of the project processes and management	Use the knowledge management guide to record the change together with its causes and effects	Share experience by sharing the database	Document the change in a change order log

13. CM: Maturity model for change management (Sun & Oza, 2008)

Main criteria	Level 1 Ad-hoc change management	Level 2 Informal change management	Level 3 Systematic change management	Level 4 Integrated change management	Level 5 Continuous improvement in change management
MANAGEMENT PROCESS	There are no consistent change management procedures or practices. Any change management process, that might exist, is not shared by the whole team. The project team is reactive to changes rather than anticipates them. There is a poor audit trail of the change management process. Changes are rarely reviewed after they occurred.	Change management processes exist, however they are not followed on a consistent basis. Many changes are handled informally without following the correct processes. The project team is still largely reactive to changes rather than anticipates them. Documentation record is poor. Changes are sometimes reviewed after they occurred.	Change management processes are followed on a consistent basis. The whole project team shares the same processes, although each team member may still operate a localized process in parallel. The project team begins to be proactive in anticipating changes. Audit trail is recorded. There is a requirement of review after a change.	Standard change management processes are adopted and followed consistently by the whole team. Processes are efficiently implemented, possibly with the support of an IT tool. Most changes are managed proactively. Change management audit trail is complete using standard documents and forms. Changes are reviewed in various contexts.	Change Management performance evaluation metrics are developed and implemented. Processes are monitored and analysed for potential improvement. The project team takes full advantage of technology support. Learning is regarded as an essential part of Change Management process.
RISK MANAGEMENT	Risk Management procedures are ad-hoc or not present at all. React after a problem occurs. No attempt is made to identify risks or to develop contingency plans. During a crisis, plans are abandoned and changes are made without clear understanding of their consequences. The project team is not aware of key circumstances that may impact the project budget and schedule.	Risk Management is recognized by the project team. However roles and responsibilities are not well defined. Risk reviews are conducted informally and not always effective. There is no systematic plan to deal with risks. Risks are often dealt with through individual initiatives. The project team does not adopt any tools to support the risk management process.	Risk Management is recognized by the project team. All team members are aware of their roles and responsibilities. There is a proactive risk management system in place. The project team adopts appropriate tools to support the risk management process. Decision making process can be easily audited.	Risk management strategy and system are clearly understood by the whole team. All team members are fully aware of their roles and responsibilities. All project risks are managed proactively in a coordinated fashion. The risk management process is supported by IT tools. Risk management effectiveness is regularly measured and corrective actions are taken when required.	Risk management is embedded in the culture and practice of the project team. All team members feel empowered to contribute to the risk management process. The risk management knowledge is captured and reused. Risk management focus is on continuous improvement, through regular reviews and measurement.
COMMUNICATION	There is no agreed project wide communication strategy and standard protocol. Communication is on a 'need to know' basis only and uses multiple mediums, such as letter, phone, e-mails, fax etc. Key decisions are made on the basis of informal communication. There is no audit trail. Communication delay is prevalent. There is no way of knowing the communication effectiveness.	There may be an agreed project wide communication strategy, but it is not implemented effectively. Communication is done using multiple methods, such as letter, phone, e-mails, fax etc. There is no effective communication audit trail. Communication delay is still a common problem. Communication problems are identified by chance, and ad hoc solutions are adopted. The same problem might occur again.	There is a project wide communication strategy, involving agreed systems to be used. Multiple communication methods are still used for different purposes. There is no central repository. There is some kind of record system to provide an audit trail. Communication delay occurs occasionally. Communication problems are identified systematically, and appropriate solutions are developed to prevent the same problem from occurring again.	Communication strategy is agreed at the beginning of the project. Communication systems are put in place. IT based systems are used to provide a central hub for project information exchange. The communication system provides an instant audit trail. Communication delay is rare. Communication problems are anticipated before they occur.	The communication systems provide good process transparency. Good communication makes positive impact on other aspects of the project. The communication effectiveness is reviewed, measured and improvement is sought on an on-going basis.

Main criteria	Level 1 Ad-hoc change management	Level 2 Informal change management	Level 3 Systematic change management	Level 4 Integrated change management	Level 5 Continuous improvement in change management
MANAGEMENT INFORMATION	There is no clearly defined information management strategy. A variety of disparate information management systems are used. Project information is stored in different places; and difficult to retrieve. It is difficult to keep track of different versions of the same document.	There are informal agreements on project information management. However, these are not implemented effectively. Each project partner uses its own information management system. Information exchange is general done through paper. There is no single information storage. Information retrieval is time consuming. It is still difficult to keep track of different versions of the same document.	There are formal agreements on project information management, which is implemented effectively. There is a shared information management system. However, each project partner also maintains its own system. There may be a single project information repository. However, access control relies on manual methods. Project information is managed in a disciplined manner.	There is a clear information management strategy, which is implemented effectively. The team adopts the same information management system; and uses it for all project information. There is a single project information repository, with proper access control support. Update project information is available instantly.	There is a clear information management strategy fully shared by the whole team. The team use the same on-line information management system, integrated with decision making process. There is a common project information server, with proper access control support. Project information is managed as a knowledge asset.
COLLABORATION	The relationship between project partners is adversarial. There is no effective team working. Project risk is allocated to each partner and managed locally. When things go wrong, project partners blame each other.	The relationship between project partners is determined by contract. Team working does not happen on a consistent basis. Collaboration depends on the individuals involved. Project risk is allocated to each partner, but managed in a coordinated fashion. When things go wrong, the party at fault is always identified and blamed.	The relationship between project partners is collaborative. Team working is encouraged. However, it does not always happen because of organizational or culture barriers. The project team works together to manage project risks. When things go wrong, the whole team helps to find a solution.	A collaborative contract is adopted. Team working is expected. Project risks are shared and proactively managed by the whole team. There is a high degree of mutual interest and trust between the project partners.	The project team is a partnership supported by a collaborative contract. Team working is the norm. Knowledge is shared. High level trust is reinforced by appropriate measures, such as open book accounting.
LEADERSHIP OBJECTIVES	There is a lack of common objective in the project team. The senior managers are not closely involved in the event of change or risk occurring. Roles and responsibilities are not clearly understood. There is a weak leadership in the project team.	The common objectives are shared by part of the team. The senior managers are informally involved in the event of change and risk. There is confusion in the roles and responsibilities of team members. Leadership is not consistent.	The team shares a common objective and work towards achieving it in the best possible manner. The project teams have high levels of motivation and senior management involvement. Senior managers take an active role in overseeing the aims and objectives of the project and help to develop necessary skills.	The whole team shares a common objective. Senior Managers provide clear leadership in the event of change and risk. Roles and responsibilities are clearly understood at all levels. 'No blame' culture is promoted.	Continuous improvement is a shared objective. Necessary training at all levels is provided prior to immediate needs. Effectively managing change is the goal of the project team and senior management. Performance measurement is adopted.

14. CM: Customized maturity model for change management adapted from (Sun & Oza, 2008)

Criteria	Topic	Sub Topic	Level 1 Informal change management	Level 2 Systematic change management	Level 3 Integrated change management	Level 4 Continuous improvement in change management
(1)	OBJECTIVES	Objectives alignment	The common objectives are shared by part of the team.	The team shares a common objective and work towards achieving it in the best possible manner.	The whole team shares a common objective.	Continuous improvement is a shared objective
(2)	CHANGE MANAGEMENT PROCEDURE	Process	Change management processes exist, however they are not followed on a consistent basis.	Change management processes are followed on a consistent basis.	Standard change management processes are adopted and followed consistently by the whole team.	Change Management performance evaluation metrics are developed and implemented.
		Sharing process	Many changes are handled informally without following the correct processes.	The whole project team shares the same processes, although each team member may still operate a localized process in parallel.	Processes are efficiently implemented, possibly with the support of an IT tool.	Processes are monitored and analysed for potential improvement.
		Roles and responsibilities	There is confusion in the roles and responsibilities of team members.	All team members are aware of their roles and responsibilities.	Roles and responsibilities are clearly understood at all levels.	All team members feel empowered to contribute to the change management process.
(3)	RISK ALLOCATION	Risk sharing	No risk sharing	Limited risk sharing	Risk sharing greatly increased	Common practice for risk sharing
		Allocation principle	Risk is always allocated to the weak party	Risk is often allocated to the weak party	Risk is allocated to the party best able to manage it in a project	Risk is allocated to the party best able to manage it in the long-term
		Balance of risk and reward	No rewards for the party taking the risk	Some rewards for the party taking the risk	Often appropriate rewards for the party taking the risk	Always appropriate rewards for the party taking the risk
(4)	RISK MANAGEMENT PROCEDURE	Strategy	Risk Management is recognized by the project team.	Risk Management is recognized by the project team.	Risk management strategy and system are clearly understood by the whole team.	Risk management is embedded in the culture and practice of the project team.
		Roles and responsibilities	Roles and responsibilities are not well defined.	All team members are aware of their roles and responsibilities.	All team members are fully aware of their roles and responsibilities.	All team members feel empowered to contribute to the risk management process.
		Approach	There is no systematic plan to deal with risks. Risks are often dealt with through individual initiatives.	There is a proactive risk management system in place.	All project risks are managed proactively in a coordinated fashion.	The project team is 'proactive' towards risk management processes
(5)	CONTINUOUS IMPROVEMENT	Learning	Changes are sometimes reviewed after they occurred.	There is a requirement of review after a change.	Changes are reviewed in various contexts.	Learning is regarded as an essential part of Change Management process.
		Performance measurement	Risk reviews are conducted informally and not always effective.	Decision making process can be easily audited.	Risk management effectiveness is regularly measured and corrective actions are taken when required.	Risk management focus is on continuous improvement, through regular reviews and measurement.
(6)	CONTINUOUS IMPROVEMENT	Communication	Sharing learning	No sharing learning and innovation	Little sharing learning and innovation	Sharing learning and innovation
(7)	CHANGE MANAGEMENT PROCESS	Approach	The project team is still largely reactive to changes rather than anticipates them.	The project team begins to be proactive in anticipating changes. The project team is 'adaptive' to managing changes.	Most changes are managed proactively. The project team is 'supportive' to managing changes.	The project team is 'proactive' towards change management processes
(7-16)	CHANGE MANAGEMENT PROCESS	Process	Change management processes exist, however they are not followed on a consistent basis.	Change management processes are followed on a consistent basis.	Standard change management processes are adopted and followed consistently by the whole team.	Change Management performance evaluation metrics are developed and implemented.
(8) (9) (15) (16)	CHANGE MANAGEMENT PROCESS	Documentation	Documentation record is poor.	Audit trail is recorded.	Change management audit trail is complete using standard documents and forms.	The project team takes full advantage of technology support.

15. UAC-IC 2005: Analysis of the change management clauses

This chapter gives you more insight into the change management procedures in the UAC-IC 2005 for both the Employer's and the Contractor's initiated variations. The UAC-IC 2005 and the Explanatory Notes to it were used to explain the change management procedures by means of flow charts. The grey highlights indicated 'open ends' in the procedure.

15.1 Relevant clauses

- §14 Variations ordered by the Employer
- §15 Variations initiated by the Contractor
- §45 Procedure for settling consequences of Variations ordered by the Employer

15.2 Variations in the UAC-IC 2005

According to the Explanatory Notes to §14, variations cannot be ordered by one single party to the other, but require consensus between the two parties. The UAC-IC 2005 provide strict procedures to ensure consensus between the parties and decisive answers. For §14 and §45 these procedures are clearly illustrated in the form of a flowchart which can be found in the annex of the Explanatory Notes to the UAC-IC 2005, therefore these flowcharts will be used in this research to help with discussing the clauses.

§14 Variations on the client's initiative

One way for the client to get actively involved in the works is by ordering variations. However, since active involvement on the part of the client is diametrically opposed to the nature of the UAC-IC 2005, the general part of the Explanatory Notes to §14 points out that the client must be circumspect in ordering variations because by doing so the client in principle becomes responsible for the ordered variations (§3 (3)) and pursuant to §45, variations could have an effect on the project price and completion date which are determined in Art. 2 of the Basic Contract (Chao-Duivis et al., 2013, pp. 103, 124).

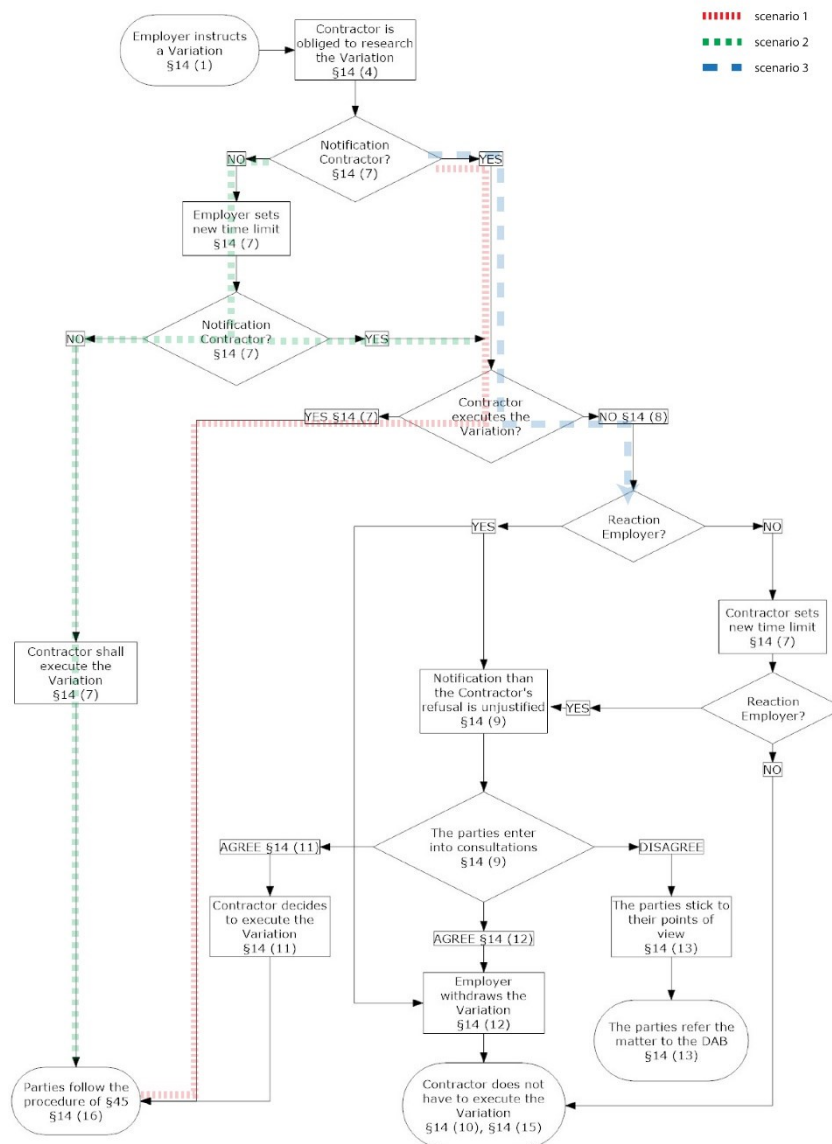


Figure 18: Procedure for variations on the client's initiative stated in §14 (adapted from (CROW, 2005, p. 112))

The flowchart of Figure 18 gives an overview of the procedure for variations initiated by the client and starts with 'client orders a variation'. §14 (1) lays down the type of variations which the client is entitled to order and reads as follows:

1. The client is entitled to order, solely in writing, the contractor to make the following variations:
 - a) variations of the requirements stated in the Employer's Requirements;
 - b) variations in the annexes of the Employer's Requirements;
 - c) variations in the Basic Contract;
 - d) variations of choices made by the contractor when carrying out work insofar as the contractor in doing so was free to interpret the requirements stated in the Employer's Requirements;
 - e) variations in accepted documents;
 - f) variations of accepted lawful representatives or independent auxiliary persons;
 - g) variations of accepted work;
 - h) and variations of accepted results of work.

The Explanatory Notes mention some reasons for the client to order such variations. For example, the client may have created some fresh ideas while the Employer's Requirements have already been drawn up (1a) or the client is not satisfied with the contractor's design, even though this design meets the requirements stated in the Employer's Requirements (1a and 1d). If this design has to be submitted for approval according to the acceptance plan and the design also meets the criteria of this acceptance plan, then the client may order a variation in accepted documents (1e). Pursuant to sub section (3), the variations in (1) also include the variations which have become necessary as a result of a circumstance for which the client is responsible by law, the contract or opinions prevailing in society, for example the failure to obtain a permit or to obtain it on time.

According to sub section (4), the contractor is obliged to carry out a research and to inform the client of the extent to which the ordered variation pursuant to sub section (1) implies a deviation of the requirements, the choices, the documents, the lawful representatives, the independent auxiliary persons, the Work or the results of the Work. The contractor has a duty to warn the client in writing immediately in case the ordered variation contains errors or displays defects that are clearly such that it would be inconsistent with the requirements of reasonableness and fairness for the contractor to proceed with carrying out the variation on this basis without giving a warning (§4 (7h)). The research will help the Contractor decide whether he should refuse to carry out the ordered variation or not and that he already gets an impression of the financial consequences and the consequences for the programme. Subsequently, the contractor has three ways to react to the ordered variation: he may notify the client in writing that he will carry out the variation or that he will not carry out the variation or he may not notify the client at all (7). The following steps in the procedure are dependent on the reaction of the contractor, therefore different scenarios are possible:

Scenario 1 - The contractor notifies the client that he will carry out the variation

This is the easiest scenario. If the parties agree on that the contractor will carry out the variation (7), pursuant to sub section (16) they shall follow the procedure for valuation of variations referred to in §45 before the contractor proceeds to carry out the variation.

Scenario 2 - The contractor does not notify the client at all

In this scenario the contractor fails to send the notification with all due dispatch and is therefore in default. The client shall set a time limit within which the contractor may still give a notification. The contractor has two ways to react to the notice of default. If the contractor does not react to the notice of default, then pursuant to sub section (7) he is in principle obliged to carry out the variation, subject to the provisions of sub section (16), which means that the parties shall follow the procedure for valuation of variations referred to in §45 before the contractor proceeds to carry out the variation. But if the contractor does react to the notice of default, then according to sub section (7) the procedure continues at the point where the contractor has to decide to carry out the variation or not and for the remaining part it will be similar to parts of other scenarios.

Scenario 3 - The contractor notifies the client that he will not carry out the variation

Sub section (8) sets out a rule that if the contractor refuses to carry out the ordered variation, he has to state his reasons in the notification, referring to one or more ground(s) for refusal which are laid down in sub section (6). §14 (6) reads as follows:

6. The contractor shall not be under an obligation to carry out a variation ordered by the client if:
 - a) the variation is not ordered in writing; or
 - b) carrying out the variation results in an unacceptable disruption of work, according to reasonableness and fairness; or
 - c) carrying out the variation results in the contractor being forced to carry out Work beyond his technical knowhow and/or capacity; or
 - d) carrying out the variation is unacceptable to the contractor, according to reasonableness and fairness, given the mutual interests of the parties.

These grounds for refusal can be interpreted in different ways and therefore they need to be assessed from case to case to determine whether the refusal is reasonable. The ground for refusal stated in sub section (6d) should be considered as a safety net in case the contractor cannot apply one of the other grounds for refusal. Subsequently, the client has three ways to react to the contractor's notice: he may notify the contractor in writing that he withdraws the variation, he may not notify the contractor at all, or he may notify the contractor in writing that in his opinion the contractor's refusal to implement the variation is not justified. The following steps in this scenario are dependent on the reaction of the client, therefore different sub scenarios are possible:

- i. if the client decides to withdraw the variation, as a result the contractor is not obliged to carry out the variation (12);
- ii. if the client does not notify the contractor at all, then the contractor shall set a time limit within which the client may still do so. Thereafter, the client has the same three ways to react. If the client still fails to send the notification, the contractor is not obliged to carry out the variation (10). According to sub section (17a), if the procedure stated in §14 is delayed due to this failure on the

- part of the client, then the contractor is entitled to a cost compensation and/or extension of time, since the delay is caused by a circumstance that cannot be attributed to the contractor (§44 (1a));
- iii. if the client is of the opinion that the contractor's refusal to implement the variation is not justified, the parties will immediately enter into consultations on, inter alia, the effect of the variation on the project price and completion date in order to overcome the deadlock (9). The consultations could lead to three different outcomes:
- First, if the parties agree on that the contractor will carry out the variation (11), then the provisions of sub section (16) shall apply and they shall follow the procedure for valuation of variations referred to in §45 before the contractor proceeds to carry out the variation.
 - Second, if the client decides to withdraw the variation, the contractor is not obliged to carry out the variation (12). According to sub section (17b), if the procedure stated in §14 is delayed due to the consultations and the client has withdrawn the variation as a result of these, then the contractor is entitled to a cost compensation and/or extension of time, since the delay is caused by a circumstance that cannot be attributed to the contractor (§44 (1a)).
 - Third, if the parties cannot come to an agreement on whether the contractor should carry out the variation, then the dispute will be brought before the Dispute Adjudication Board (DAB), provided that the parties have authorized this board in the Basic Contract (article 18) to settle disputes (13). If the parties have not authorized the DAB, the dispute can be brought before the Court of Arbitration (§47 (2) and (5)). If the DAB is of the opinion that the contractor's refusal to carry out the variation is not justified, then pursuant to sub section (14) he is obliged to carry out the variation subject to the provisions of sub section (16). However, if the DAB is of the opinion that the contractor's refusal to carry out the variation is justified based on the grounds for refusal of sub section (6), then according to sub section (15) he is not obliged to carry out the variation. According to sub section (17c), if the procedure stated in §14 is delayed due to calling in the DAB and the DAB decides that the contractor's refusal to carry out the variation is justified, then the contractor is entitled to a cost compensation and/or extension of time, since the delay is caused by a circumstance that cannot be attributed to the contractor (§44 (1a)).

§45 Resolution procedure as a result of variations on the client's initiative

The flowchart of Figure 19 gives an overview of the resolution procedure due to variations on the client's initiative which is stated in §45. Pursuant to §14 (16) the parties shall follow this procedure before the contractor proceeds to carry out the variation. It is important to note that this clause also sets out that the contractor is not obliged to carry out the variation in case the parties are not able to agree in the procedure of §45 on how to divide the financial consequences and the consequences for the programme, inherent to the variation, among them.

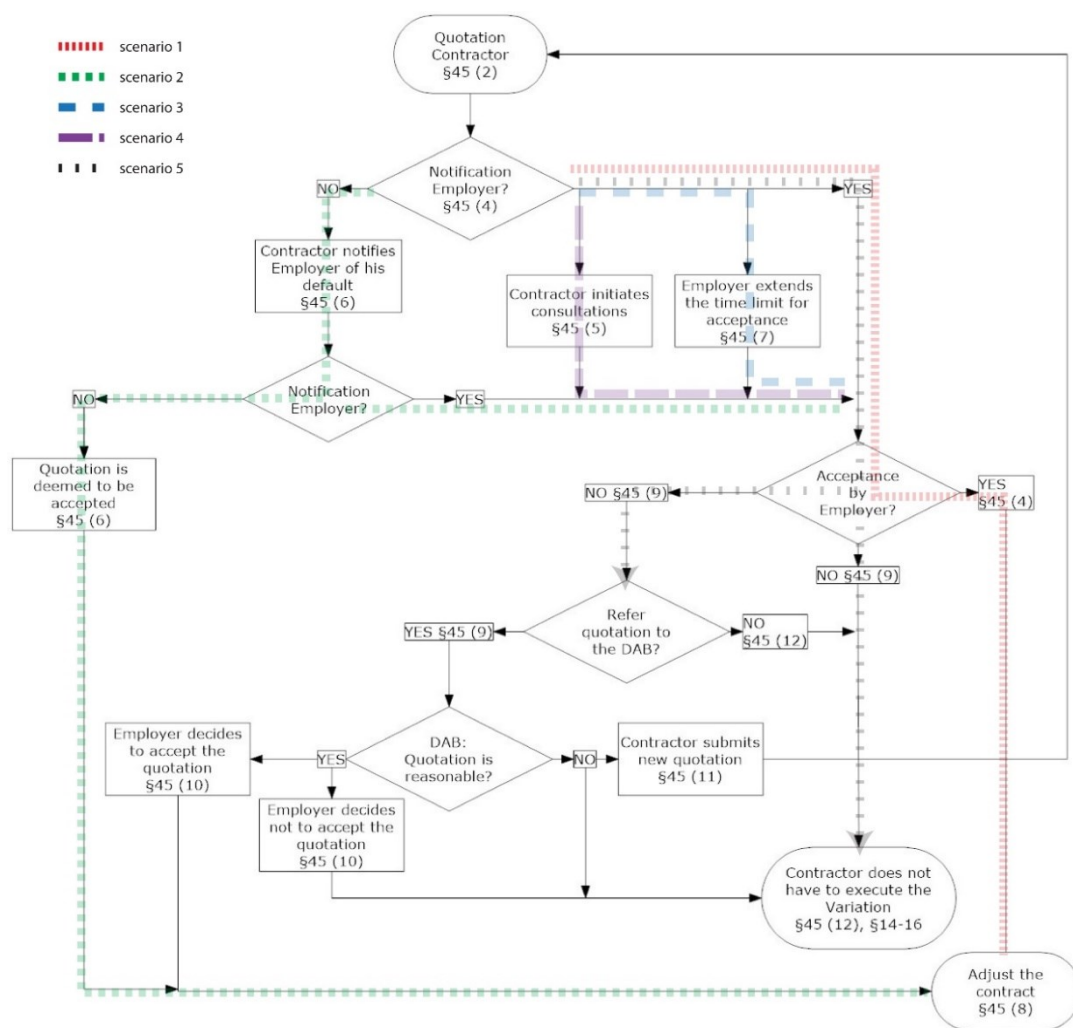


Figure 19: Resolution procedure as a result of variations on the client's initiative §45 (adapted from (CROW, 2005, p. 115))

The first step in this procedure is that the contractor shall send the client a written quotation with all due dispatch, stating the financial consequences and the consequences for the programme inherent to the variation. More specifically, the contractor will have to state the balance (comprising of all costs related to the execution of the variation less the costs for reduced work as a result of the execution of the variation), the adjustment of the time schedule in the annex of the Employer's Requirement, the agreed milestones and the completion date in the Basic Contract, and the adjustment of the payment schedule (2). Regardless of whether the parties will agree on that quotation, the contractor is entitled to a reasonable compensation of the costs for drawing up the quotation (3). Subsequently, the client has five ways to react to the quotation: he may notify the contractor in writing to accept or not to accept the quotation, he may not notify the contractor at all, he may invite the contractor in writing to consultations about the submitted quotation, or he may notify the contractor in writing to extend the time limit for within which the client can decide on accepting the quotation or not. The following steps in the procedure are dependent on the reaction of the client, therefore different scenarios are possible:

Scenario 1 - The client accepts the quotation

This is the easiest scenario. If the client decides to accept the quotation, the contract will be adjusted according to the content of the quotation and the contractor will carry out the variation (8).

Scenario 2 - The client does not notify the contractor at all

In this scenario the client fails to send the notification with all due dispatch and is therefore in default. The contractor shall set a time limit within which the client may still give a notification, while referring to the possibility for the client to extend the time limit which is stated in sub section (7). The client has two ways to react to the notice of default. If the client does not react to the notice of default, then pursuant to sub section (6) the quotation shall be deemed to have been accepted by the client from the moment the further time lapses and in that event the provisions of sub section (8) shall apply, which means that the contract will be adjusted according to the content of the quotation and the contractor will carry out the variation. However, if the client does react to the notice of default, the procedure continues at the point where the client decides on whether to go for consultations, time limit extension or acceptance of the quotation and for the remaining part it will be similar to parts of other scenarios. According to sub section (13a), if the procedure stated in §45 is delayed due to the failure to send the notification on the part of the client, then the contractor is entitled to a cost compensation and/or extension of time, since the delay is caused by a circumstance that cannot be attributed to the contractor (§44 (1a));

Scenario 3 - The client extends the time limit for acceptance of the quotation

Pursuant to sub section (7) the client may extend the time limit for within which he can decide on accepting the quotation or not. In case the client wants to use this option, he shall immediately notify the contractor in writing within which term he will reach that decision and his reasons for this choice. According to sub section (13b), if the procedure stated in §45 is delayed due to this time limit extension by the client, the contractor is entitled to a cost compensation and/or extension of time, since the delay is caused by a circumstance that cannot be attributed to the contractor (§44 (1a)). After the decision to extend the time limit, the procedure continues at the point where the client has to decide on the acceptance of the quotation and for the remaining part it will be similar to parts of other scenarios.

Scenario 4 - The client invites the contractor to consultations about the submitted quotation

In this scenario, the client invites the contractor in writing to consultations about the submitted quotation. According to sub section (5) the contractor is obliged to accept this invitation within the bounds of reasonableness and fairness. During the consultations, the client may ask the contractor to further explain the quotation. The consultations could lead to an adjustment of the quotation, which should be put in writing by the contractor. After the consultations, the procedure continues at the point where the client has to decide on the acceptance of the quotation and for the remaining part it will be similar to parts of other scenarios.

Scenario 5 - The client does not accept the quotation

Sub section (9) sets out a rule that if the client decides to reject the quotation, he shall include a written motivation to his notification to the contractor. After that, the client has to decide whether he wants to submit the quotation (and any other further agreements made during consultations) to the Dispute Adjudication Board (DAB) or not to have this Board determine whether the quotation qualifies as reasonable, provided that the parties have authorized this board in the Basic Contract (article 18) to settle disputes. If the parties have not authorized the DAB, the dispute can be brought before the Court of Arbitration (§47 (2) and (5)). If the client decides not to submit the quotation to the DAB, pursuant to sub section (12) the provisions of §14 (16), second sentence, shall apply, which states that the contractor is not obliged to carry out the variation in case the parties are not able to agree in the procedure of §45 on how to divide the financial consequences and the consequences for the programme, inherent to the variation, among them. However, if the client decides to submit the quotation to the DAB, the DAB will determine whether the quotation is reasonable or not, but the Board is not authorized to make adjustments to the quotation. Different outcomes are possible:

- First, pursuant to sub section (10), if the DAB is of the opinion that the quotation is reasonable, the client can either accept or reject the quotation. In the former case the provisions of sub section (8) shall apply, which means that the contract will be adjusted according to the content of the quotation and the contractor will carry out the variation, whereas in the latter case the provisions of §14 (16), second sentence, shall apply. According to sub section (13c), if the procedure stated in §45 is delayed due to calling in the DAB and the DAB decides that the quotation qualifies as reasonable, then the contractor is entitled to a cost compensation and/or extension of time, since the delay is caused by a circumstance that cannot be attributed to the contractor (§44 (1a)).
- Second, pursuant to sub section (11), if the DAB is of the opinion that the quotation is not reasonable, the contractor must submit a new quotation with due dispatch. In this case the procedure stated in §45 has to start all over again. Therefore, the client may request the DAB to determine that the contractor shall already start the execution of the variation while drawing up the new quotation. If the DAB honors this request, which is more likely when the Board expects the client will accept the revised quotation, then the contractor is obliged to carry out the variation.

§15 Variations on the contractor's initiative

Sub section (1) lays down the types of variations which the contractor is entitled to initiate. An approval from the client is in principle not required for these types of variations when these are variations to earlier made decisions of the contractor of which the client has not been informed. This sub section reads as follows:

1. Provided that work, the works and the long-term maintenance are in accordance with the provisions of the Contract, the Contractor shall be entitled to carry out:
 - a) variations of choices made by the contractor when carrying out work insofar as the contractor in doing so was free to interpret the requirements stated in the Employer's Requirements;
 - b) variations of documents;
 - c) variations of lawful representatives or independent auxiliary persons;
 - d) variations of work;
 - e) and variations of results of work.

These variations shall only be allowed, if such choices, documents, lawful representatives, independent auxiliary persons, work and results of work have not yet been tested or accepted by the client in the event that such test or acceptance is stated in the design work test plan, the construction work inspection plan, the maintenance work inspection plan or the acceptance plan, or insofar as the client has not yet been informed otherwise.

The Explanatory Notes mention some reasons for the contractor to make such variations. For example, the contractor discovers errors in the documents, work, and results of work, or a risk event materializes (or this is about to happen), as a result an unchanged proceeding of the work is no longer possible, or the contractor may have a way to execute the work or maintenance better (i.e. cheaper, faster and/or more quality).

Sub section (2) sets out a rule that if the variations as referred to in sub section (1) have already been tested or accepted by the client, then the contractor shall only be entitled to carry out the variations insofar as he has submitted the variations for testing to the client with due observance of the provisions of §20 (testing design work) and §21 (testing construction work and maintenance work) and that work, the works and the long-term maintenance shall be in accordance with the provisions of the contract.

Pursuant to sub section (3), the contractor is obliged to submit his proposal for acceptance for the following variations and shall follow the acceptance procedure stated in §23 for these variations: variations of the requirements stated in the Employer's Requirements, variations of lawful representatives or variations referred to in sub section (1) that have already been accepted by the client on the basis of the acceptance plan. The client may reject the contractor's proposal if it does not meet the criteria of the acceptance plan. Pursuant to sub section (4), a variation of the requirements stated in the Employer's Requirements may always be rejected by the client without giving the reasons. The idea behind this provision is that the client should not be forced upon a performance that does not meet the requirements he has set.

16. NEC3 ECC: Analysis of the change clauses

This chapter gives you more insight into the change management procedure in the NEC3 ECC. The NEC3 ECC, the Guidance Notes to it and the Flowcharts to it were used to explain the change management procedure by means of flow charts. The grey highlights indicated ‘open ends’ in the procedure.

16.1 Relevant clauses

- §60 Compensation events
- §61 Notifying compensation events
- §62 Quotations for compensation events
- §63 Assessing compensation events
- §64 The Project Manager’s assessments
- §65 Implementing compensation events

16.2 Variations in the NEC3 ECC

The NEC3 ECC does not have a separate procedure for dealing with variations. Variations are dealt with through the Compensation Events procedure (i.e. the claims procedure). A variation is a Compensation Event (CE), but not all CEs are variations. The CEs procedure for consists of several steps: identification, notification, quotation, assessment, and implementation. The procedure is illustrated in the form of several flowcharts in order to discuss the clauses on CEs more clearly. I only discussed the CEs which constitute variations.

§60 Determine whether the variation is a compensation event

The flowchart of Figure 20 starts with ‘A potential variation has been identified’. The first step in the procedure is to determine whether the variation constitutes a compensation event. In §60 (1), 19 events are listed which constitute a compensation event. The Secondary Option clauses also contain some compensation events. The following compensation events may arise from a variation:

- Compensation events arising from an instruction or changed decision by Project Manager or Supervisor:
 - §60 (1.1) change to the Works Information
 - §60 (1.8) previous decision changed
 - §60 (6) correcting a mistake in the bill of quantities (only for Options B and D)
 - §X12 (3.6) change to the partnering information
 - §X12 (3.7) change to the partners’ timetable
 - §Z other compensation events
- Other compensation events:
 - §Z other compensation events

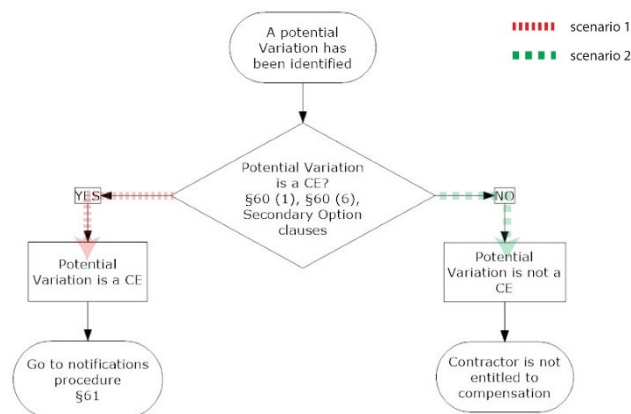


Figure 20: Procedure for determining whether the variation is a compensation event in §60

Two different scenarios are possible here:

Scenario 1 – The variation constitutes a compensation event

If the variation constitutes a CE, the procedure continues with the notification of the CE.

Scenario 2 – The variation does not constitutes a compensation event

If the variation does not constitute a CE, then the procedure is finished and the Contractor is not entitled to compensation.

§61 Notification of the occurrence of a CE by either the Project Manager or the Contractor

According to §13 (1) and §13 (7), a notification must be communicated separately from other communications, must be communicated in a form which can be read, copied and recorded, and the writing must be in the language of the contract. Pursuant to §61 (7), compensation events can only be notified before the defects date has occurred. Therefore, the parties should check this prior to notifying a compensation event. The defects date should be determined by the Employer in the Contract Data Part One and is a period of time after Completion of the whole of the works for which the defects procedure will apply. According to (Rowlinson, 2011, p. 68), this period of time is often called the maintenance period, the defects liability period or the rectification period in other forms of contract and in the construction industry.

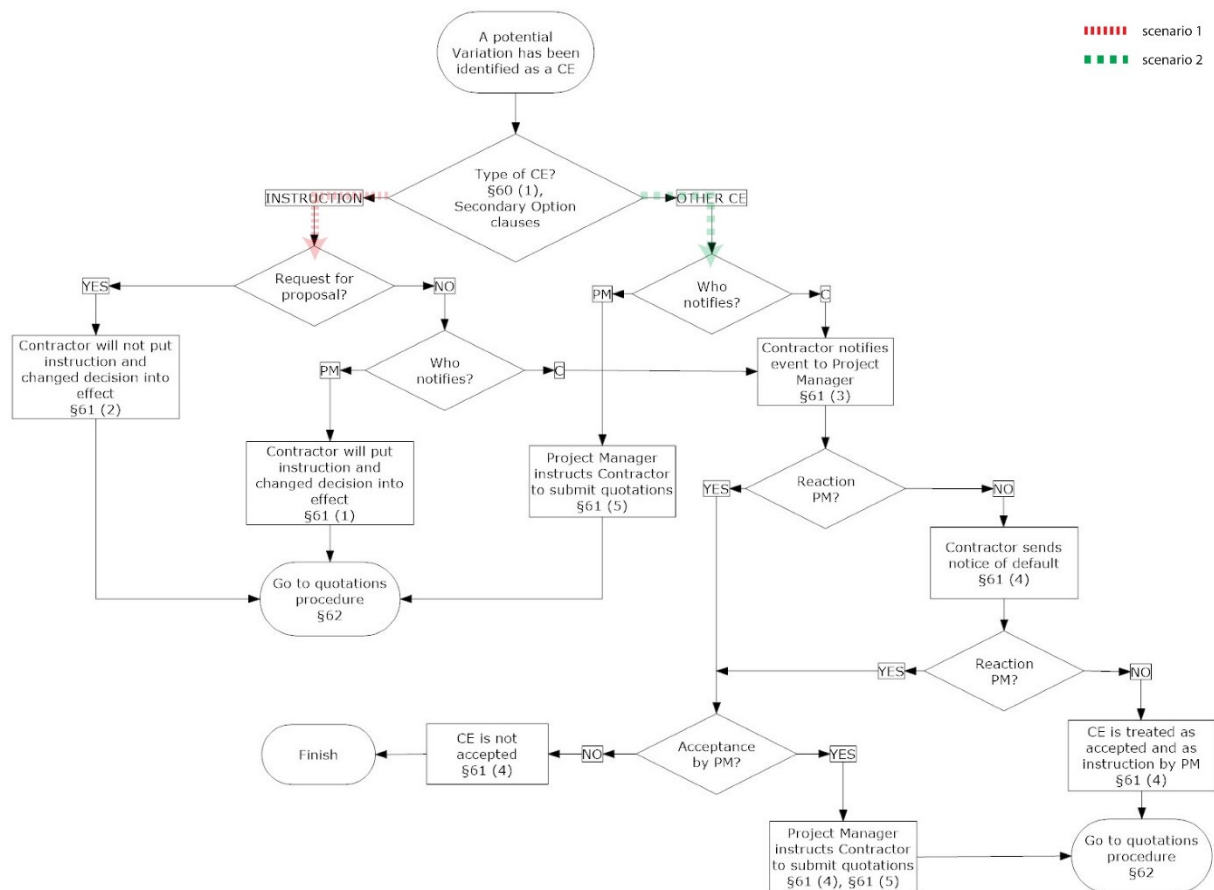


Figure 21: Procedure for notifying the occurrence of a CE in §61

The next steps in the procedure are dependent on the type of compensation event, therefore two scenarios can be distinguished:

Scenario 1 - Compensation events arising from an instruction or changed decision by Project Manager or Supervisor

Pursuant to §61 (1), compensation events which arise from the Project Manager or the Supervisor giving an instruction, issuing a certificate, changing an earlier decision or correcting an assumption should be notified by Project Manager to the Contractor at the time of that communication. In addition, if the event does not arise from a fault of the Contractor or if quotations have not already been submitted, then the Project Manager instructs the Contractor to submit quotations. According to the Guidance Notes to §61 (1), it is advisable for the Project Manager to give his reasons for not instructing quotations in the notification in order to avoid misunderstanding. Three sub scenarios can be distinguished, dependent on whether the instruction or the decision change is final or proposed and on who notifies the CE:

- i. If the Project Manager instructs the Contractor to submit quotations for a proposed instruction or a proposed decision change, then pursuant to §61 (2), the Contractor will not put the instruction and changed decision into effect. **The procedure continues with the quotation of the CE.**
- ii. If the Project Manager notifies the CE concerning an instruction or a changed decision and instructs the Contractor to submit quotations for it, then pursuant to §61 (1) the Contractor will put the instruction and changed decision into effect and the procedure continues with the quotation of the CE.
- iii. If the Project Manager does not notify the CE concerning an instruction or a changed decision and does not instruct the Contractor to submit quotations for it, then pursuant to §61 (3) the Contractor may notify the event to the Project Manager. **Subsequently, the procedure continues at the point where the Project Manager has to decide to reply to this notification or not.**

Scenario 2 - Other compensation events

Compensation events which do not arise from an instruction or changed decision by Project Manager or Supervisor could be notified by either the Project Manager or the Contractor. Two sub scenarios can be distinguished, dependent on who notifies the compensation event:

- i. If the Project Manager notifies the CE, then he instructs the Contractor to submit quotations and the procedure continues with the quotation of the CE. If according to the Project Manager the Contractor did not give an early warning of an event which an experienced contractor could have given, then pursuant to §61 (5) the Project Manager should mention this in his instruction. Both the Contractor and the Project Manager have the obligation to notify the other as soon as one becomes aware of a matter which could increase the total of the Prices, delay Completion, delay meeting a Key Date or impair the performance of the works in use. The Contractor may also give an early warning in case a matter could increase his total cost (§16 (1)).

- ii. If the Contractor believes that an event which has happened or which he expects to happen constitutes a compensation event, then pursuant to §61 (3) the Contractor must notify the Project Manager. In doing so, the Contractor and the event itself have to meet certain requirements before he is entitled to compensation:

- the Project Manager has not notified the event to the Contractor;
- the notification should be within eight weeks of becoming aware of the event.

Subsequently, the Project Manager has three ways to react to the Contractor's notification:

- First, the Project Manager may decide not to accept the compensation event and notifies the Contractor of his decision. Reasons for not accepting the compensation event are listed in §61 (4). The first paragraph of this sub section reads as follows:

4. If the Project Manager decides that an event notified by the Contractor

- arises from a fault of the Contractor,
- has not happened and is not expected to happen,
- has no effect upon Defined Cost, Completion or meeting a Key Date or
- is not one of the compensation events stated in this contract

he notifies the Contractor of his decision that the Prices, the Completion Date and the Key Dates are not to be changed.

According to the Guidance Notes to §61 (4), the Contractor may dispute the Project Manager's decision and refer it to the Adjudicator.

- Second, the Project Manager may decide to accept the compensation event. Then according to §61 (4) he must notify the Contractor of his decision and instructs him to submit quotations within one week or if agreed a longer period after the Contractor's notification. If according to the Project Manager, the Contractor did not give an early warning of an event which an experienced contractor could have given, then pursuant to §61 (5) the Project Manager must mention this in his instruction. **The procedure continues with the quotation of the CE.**
- Third, the Project Manager may not give a reaction at all. In this case the Contractor may notify the Project Manager of his failure (§61 (4)). If the Project Manager does not react to the notice of default within two weeks, then pursuant to §61 (4) the compensation event is treated as accepted by the Project Manager and as an instruction to submit quotations. In addition, no reply from the Project Manager to a communication from the Contractor within the period required by the contract constitutes a new compensation event (CE #6 in §60 (1)). **The procedure continues with the quotation of the CE. However, if the Project Manager does react to the notice of default, the procedure continues at the point where the Project Manager has to decide to accept the compensation event or not.**

The following applies for both scenarios: if the Project Manager decides that the effects of a compensation event are too uncertain to be forecast reasonably, then according to §61 (6) the Contractor will base the quotation on assumptions which are to be stated by the Project Manager in his instruction to the Contractor. If these assumptions turn out to be wrong, the Project Manager will notify a correction. Such a correction constitutes a new compensation event (CE #17 in §60 (1)).

§62 and §63 Contractor submits quotations for the compensation event

According to §62 (2) the quotations consist of proposed changes to the Prices, to the Completion Date, and to the Key Dates, and must be detailed in the manner prescribed by §63 (1) and §63 (3). If the compensation events alters the programme for remaining work, the Contractor should also include the changes to the Accepted Programme. He may include risk allowances for cost and time for matters which have a significant probability of occurring and are at his risk (§63 (3)). The Contractor is expected to react competently and promptly to the compensation event (§63 (7)). Pursuant to §63 (4), if the Employer and the Contractor want to make changes to the Prices, to the Completion Date, and to the Key Dates, they can only do this by following the compensation event procedure.

§63 (8) sets out a rule that if a CE concerns a change to the Works Information in order to resolve an ambiguity or inconsistency, then the Prices, the Completion Date and the Key Dates will be interpreted least favourable to the Party which was responsible for drafting the Works Information.

Changes to the Prices

§63 (1) lays down how the changes to the Prices must be assessed which according to the Guidance Notes to §63 (1) is different from other standard forms of contract where variations are valued using the rates and prices in the contract as a basis. This sub section reads as follows:

1. The changes to the Prices are assessed as the effect of the compensation event upon
 - the actual Defined Cost of the work already done,
 - the forecast Defined Cost of the work not yet done and
 - the resulting Fee.

If the compensation event arose from the Project Manager or the Supervisor giving an instruction, issuing a certificate, changing an earlier decision or correcting an assumption, the date which divides the work already done from the work not yet done is the date of that communication. In all other cases, the date is the date of the notification of the compensation event.

Table 97: Rules set out in §63 (10) to §63 (15) concerning the assessments for changed Prices for compensation events

	§63 (10)	§63 (11)	§63 (12)	§63 (13)	§63 (14)	§63 (15)
A	x		x		x	
B	x			x		
C		x	x			x
D		x		x		x
E						x
F						

§63 (10) to §63 (15) set out rules concerning the assessments for changed Prices for compensation events. The applicability of these sub sections is dependent on which main Option was chosen. The table above gives an overview of this.

Depending on the chosen main Option, the Defined Cost is based on either the cost of the components in the Schedule of Cost Components (Options C, D and E) or in the Shorter Schedule of Cost Components (Options A and B) (§11 (2)). §63 (15), which is applicable to Options C, D and E, sets out a rule that if the Project Manager and the Contractor agree, the Contractor must and the Project Manager may assess the compensation event using the Shorter Schedule of Cost Components. The cost components of both schedules are subdivided in seven categories: people, equipment, plant and materials, charges, manufacture and fabrication, design, and insurance.

For the Options C, D and E the fee percentages are determined in the Contract Data part two, whereas for the Options A and B the fee is determined in §11 (2) and is 'the sum of the amounts calculated by applying the subcontracted fee percentage to the Defined Cost of subcontracted work and the direct fee percentage to the Defined Cost of other work'.

§63 (2) sets out a rule that if the effect of a compensation event is to reduce the total Defined Cost, the Prices are not reduced except as stated in the contract. According to the Guidance Notes to §63 (2), such exceptions are laid down in several sub clauses and are dependent on the chosen main Option (Table 98):

Table 98: The exceptions stated in §63 (2) in the NEC3 ECC

Sub clause	Description	Applicable to
§60 (4)	If the Defined Cost per unit of quantity is reduced due to a difference in quantities, the affected rate is reduced.	B, D
§60 (6)	Correcting a mistake in the Bill of Quantities may lead to reduced Prices.	B, D
§63 (10)	If the event is a change to the Works Information or a correction of an assumption stated by the Project Manager for assessing an earlier compensation event, the Prices are reduced.	A, B
§63 (11)	If the event is a change to the Works Information, other than a change to the Works Information provided by the Employer which the Contractor proposed and the Project Manager has accepted or a correction of an assumption stated by the Project Manager for assessing an earlier compensation event, the Prices are reduced.	C, D
X2	If the effect of a compensation event which is a change in the law is to reduce the total Defined Cost, the Prices are reduced.	All
Z	Additional compensation events may be included in the Contract Data by using Option Z which specifically states that these can lead to reduced Prices.	All

§63 (12) and §63 (13) set out rules that assessments for changed Prices for CEs are in the form of changes to the Activity Schedule and the Bill of Quantities (BOQ) respectively. The changes to the BOQ are determined by whether the work is already done or not and whether the work has an item in the BOQ or not. The last paragraph of §63 (13) sets out a rule that if the Project Manager and the Contractor agree, rates and lump sums may be used to assess a compensation event. The same rule is stated in §63 (14).

Changes to the Completion Date and Key Dates

§63 (3) lays down how the changes to the Completion Date and Key Dates must be assessed and reads as follows:

3. A delay to the Completion Date is assessed as the length of time that, due to the compensation event, planned Completion is later than planned Completion as shown on the Accepted Programme. A delay to a Key Date is assessed as the length of time that, due to the compensation event, the planned date when the Condition stated for a Key Date will be met is later than the date shown on the Accepted Programme.

The Guidance Notes to §63 (3) mention that no compensation event can result in a reduction in the time for carrying out the works. An earlier Completion Date and Key Date can only be achieved by an agreed acceleration (§36).

§63 (9) sets out a rule that if a CE concerning a change to the Works Information makes the description of the Condition for a Key Date incorrect, then the Project Manager must correct the description and such correction is taken into account in assessing the CE.

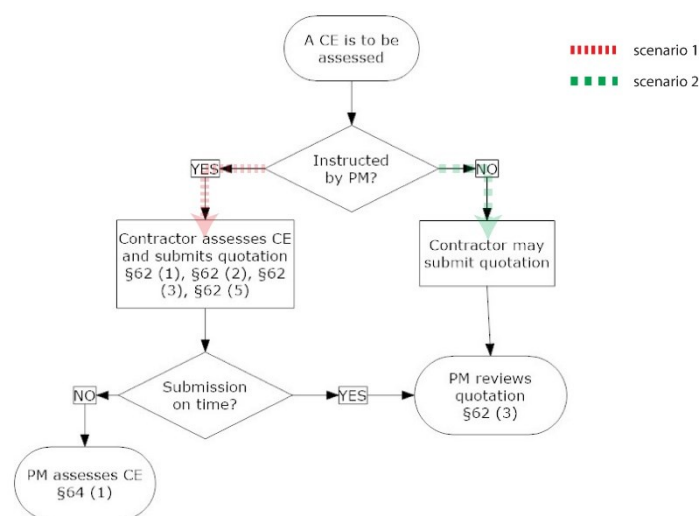


Figure 22: Procedure for submitting the quotation for the CE by the Contractor in §62 and §63

Two scenarios can be distinguished here: the Contractor may submit quotations after or without being instructed to do so by the Project Manager.

Scenario 1 - The Contractor submits quotations after being instructed to do so by the Project Manager

If the Project Manager has instructed the Contractor to submit quotations for a compensation event, the Contractor is obliged to submit these within three weeks after the instruction. An extension of this period of time is possible according to §62 (5) if the Project Manager and the Contractor agree on this prior to the deadline for submission. Such an agreement should be notified by Project Manager to the Contractor. Prior to the giving the instruction, the Project Manager is required to discuss possible ways of dealing with the CE with the Contractor in order to exclude impracticable methods. As a result of such discussions the Project Manager may instruct the Contractor to submit alternative quotations and the Contractor may also do this without being instructed (§62 (1)). Alternative quotations may take more time to draft for the Contractor, therefore it could be one of the reasons to extend the period for submission. According to the Guidance Notes to §62 (1), the Contractor may include the costs for preparing quotations in Defined Cost when main Option C, D, E or F is selected. When main Option A or B is selected, the Contractor should include such costs in his tendered fee percentages.

If the Contractor submits the quotations on time, pursuant to §62 (3) the procedure continues with the reviewing of the quotations by the Project Manager, otherwise pursuant to §64 (1) the procedure continues with assessment by the Project Manager.

Scenario 2 - The Contractor submits quotations without being instructed to do so by the Project Manager

In this scenario, the procedure continues with the reviewing of the quotations by the Project Manager.

§62, §63 and §64 Project Manager reviews submitted quotations for the compensation event

The Project Manager must reply within two weeks of the submission (§62 (3)). An extension of this period of time is possible according to §62 (5) if the Project Manager and the Contractor agree on this prior to the deadline for reply. Such an agreement should be notified by Project Manager to the Contractor.

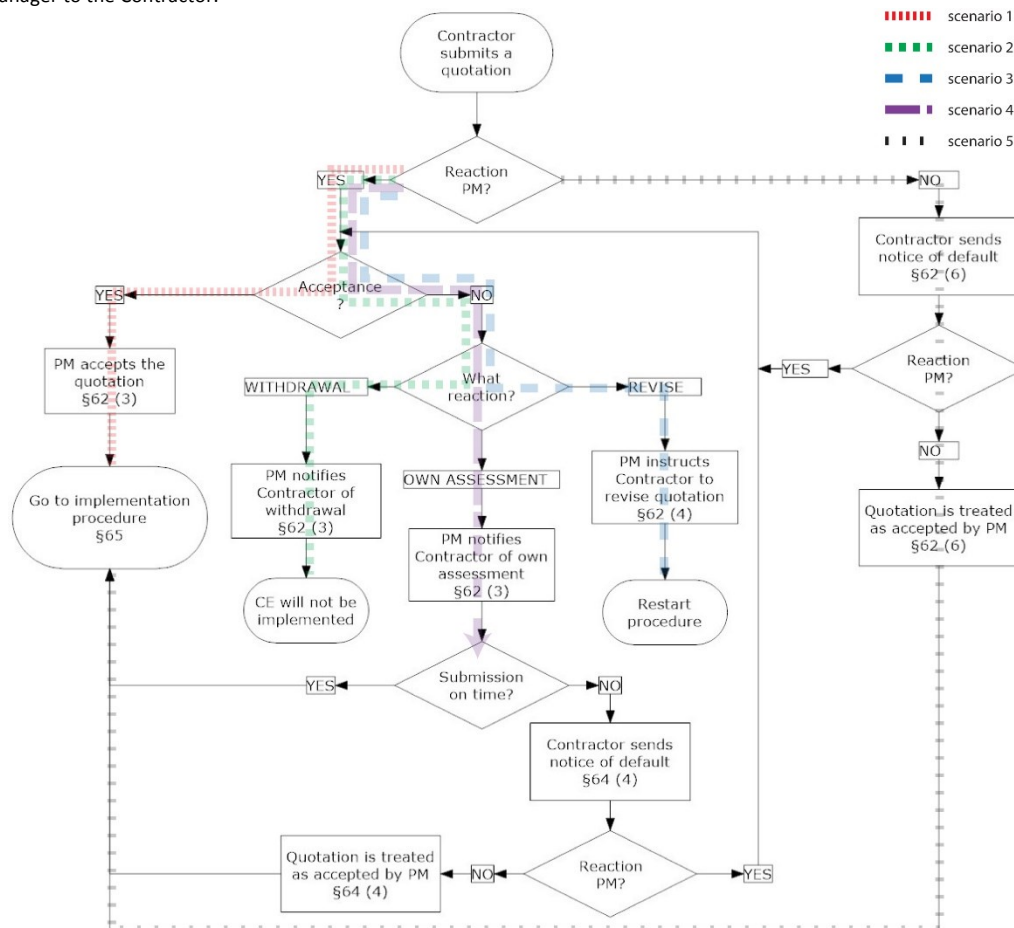


Figure 23: Procedure for reviewing the submitted quotation for the CE by the Project Manager in §62-64

Five different scenarios can be distinguished, dependent on the Project Manager's reaction to the submitted quotation. The following applies to all scenarios: As mentioned earlier in this chapter, if according to the Project Manager the Contractor did not give an early warning of an event which an experienced contractor could have given, then pursuant to §61 (5) he should mention this in his instruction to the Contractor to submit the quotations. §63 (5) lays down the sanction for the Contractor for not giving such early warning, which is that the event is assessed as if the Contractor had given early warning.

Scenario 1 - The Project Manager accepts the submitted quotation

This is the easiest scenario. If the Project Manager's reply is an acceptance of the submitted quotation, the procedure continues with the implementation of the CE (§62 (3) and §65 (1)).

Scenario 2 - The Project Manager withdraws the proposed instruction or proposed decision change

This scenario is only possible if the CE arose from an instruction or changed decision by Project Manager or Supervisor. If the Project Manager decides that a proposed instruction or a proposed decision change will not be made, then pursuant to §62 (3) he must send a notification to the Contractor of this decision.

Scenario 3 - The Project Manager gives an instruction to submit a revised quotation

If the Project Manager instructs the Contractor to submit a revised quotation, he must explain his reasons for doing so to the Contractor. After the instruction, the Contractor must submit the revised quotation within three weeks. If the quotation was based on assumptions, the Project Manager may alter or add to these in his new instruction (§62 (4)). Subsequently, the procedure restarts.

Scenario 4 - The Project Manager will make his own assessment

If the Project Manager decides to make his own assessment, then according to §62 (3) he must notify the Contractor of this decision. §64 (1) and §64 (2) lay down when the Project Manager must make his own assessment and read as follows:

1. The Project Manager assesses a compensation event
 - if the Contractor has not submitted a quotation and details of his assessment within the time allowed,
 - if the Project Manager decides that the Contractor has not assessed the compensation event correctly in a quotation and he does not instruct the Contractor to submit a revised quotation,
 - if, when the Contractor submits quotations for a compensation event, he has not submitted a programme or alterations to a programme which this contract requires him to submit or
 - if, when the Contractor submits quotations for a compensation event, the Project Manager has not accepted the Contractor's latest programme for one of the reasons stated in this contract.
2. The Project Manager assesses a compensation event using his own assessment of the programme for the remaining work if
 - there is no Accepted Programme or
 - the Contractor has not submitted a programme or alterations to a programme for acceptance as required by this contract.

If the Contractor does not agree with the Project Manager's assessment of the programme, then according to the Guidance Notes to §64 (2) he may refer this matter to the Adjudicator who may change the assessment. After the need for the Project Manager's quotations becomes apparent, pursuant to §64 (3) he is obliged to submit the quotations within the same period for submission as the Contractor, which is by default three weeks and if extended a bit longer. Dependent on whether the Project Manager submits his quotations on time, two different sub scenarios are possible:

- i. if the Project Manager submits his quotations on time, the procedure continues with the implementation of the CE (§65 (1)).
- ii. if the Project Manager does not submit his quotations on time, then according to §64 (4) the Contractor may notify the Project Manager of his failure. In case the Contractor has submitted more than one quotation, he must state in his notification which quotation he proposes to be accepted. On the one hand, if the Project Manager does not react to the notice of default within two weeks, then pursuant to §64 (4) the quotation is treated as accepted by the Project Manager. In addition, no reply from the Project Manager to a communication from the Contractor within the period required by the contract constitutes a new compensation event (CE #6 in §60 (1)). The procedure continues with the implementation of the CE (§65 (1)). According to the Guidance Notes to §64 (4), the Employer may refer the matter to the Adjudicator if he does not agree with the acceptance of the quotation. On the other hand, if the Project Manager does react to the notice of default, the procedure continues at the point where the Project Manager has to decide to accept the Contractor's quotation or not.

Scenario 5 - The Project Manager does not give a reaction at all

If the Project Manager does not reply to the submitted quotations within the time allowed, then according to §62 (6) the Contractor may notify the Project Manager of his failure. In case the Contractor has submitted more than one quotation, he must state in his notification which quotation he proposes to be accepted. On the one hand, if the Project Manager does not react to the notice of default within two weeks, then pursuant to §62 (6) the quotation is treated as accepted by the Project Manager, unless the quotations were for a proposed instruction or a proposed decision change. In addition, no reply from the Project Manager to a communication from the Contractor within the period required by the contract constitutes a new compensation event (CE #6 in §60 (1)). The procedure continues with the implementation of the CE (§65 (1)). According to the Guidance Notes to §62 (6), the Employer may refer the matter to the Adjudicator if he does not agree with the acceptance of the quotation. On the other hand, if the Project Manager does react to the notice of default, the procedure continues at the point where the Project Manager has to decide to accept the Contractor's quotation or not.

§65 Implementation of the compensation event

§65 (1) summarizes when a compensation event is implemented and reads as follows:

1. A compensation event is implemented when
 - the Project Manager notifies his acceptance of the Contractor's quotation,
 - the Project Manager notifies the Contractor of his own assessment or
 - a Contractor's quotation is treated as having been accepted by the Project Manager.

§65 (2) sets out a rule that an assessment of a compensation event will not be revised if it turns out to be wrong. If the assessment was based on wrong assumptions, these assumptions may be corrected by a separate compensation event (CE #17 in §60 (1)).

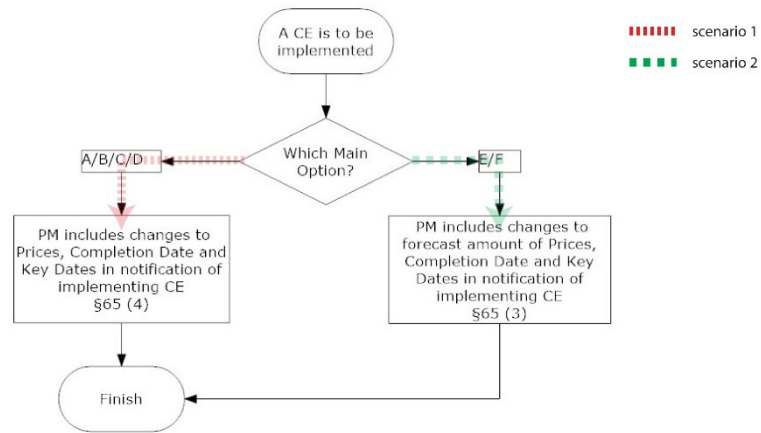


Figure 24: Procedure for implementing the CE in §65

Two different scenarios are possible, dependent on the chosen main Option:

Scenario 1 - Main Option A, B, C or D was chosen

If either one of these main Options was chosen, then pursuant to §65 (4) the Project Manager must include the changes to the Prices, the Completion Date and the Key Dates in the notification implementing the compensation event.

Scenario 2 - Main Option E or F was chosen

If either one of these main Options was chosen, then pursuant to §65 (3) the Project Manager must include the changes to the forecast amount of the Prices, the Completion Date and the Key Dates in the notification implementing the compensation event.

17. FIDIC YB: Analysis of the change clauses

This chapter gives you more insight into the change management procedures in the FIDIC YB for both the Engineer's and the Contractor's initiated variations. The FIDIC YB, the Contracts Guide to it, and (Jaeger & Høk, 2010) were used to explain the change management procedures by means of flow charts. The grey highlights indicated 'open ends' in the procedure.

17.1 Relevant clauses

- §3 The Engineer
- §13 Variations and adjustments

17.2 Variations in the FIDIC YB

Variations can be initiated by any of three ways: an instruction of the Engineer, a proposal of the Contractor or a request for a proposal of the Engineer. The procedure for dealing with Variations depends on the way the Variation was initiated, therefore three different procedures can be distinguished. The procedures are illustrated in the form of flowcharts, which are used in this research to help discuss the clause on Variations.

Variation initiated by an instruction of the Engineer

The flowchart of Figure 25 gives an overview of the procedure for Variations initiated by an instruction of the Engineer and starts with 'Engineer instructs a Variation'. §3 (3) lays down the Engineer's right to issue instructions to the Contractor at any time and sets out a rule to apply §13 if an instruction constitutes a Variation. According to §13 (1), a Variation ordered by the Engineer has to meet two requirements: the Variation must be ordered prior to issuing the Taking-Over Certificate for Works and the Variation does not comprise the omission of any work which is to be carried out by others. The FIDIC yellow book does not include a list of possible Variations which the Engineer is entitled to order. In §1 (1) a Variation is defined as 'any change to the Employer's Requirements or the Works, which is instructed or approved as a variation under §13'.

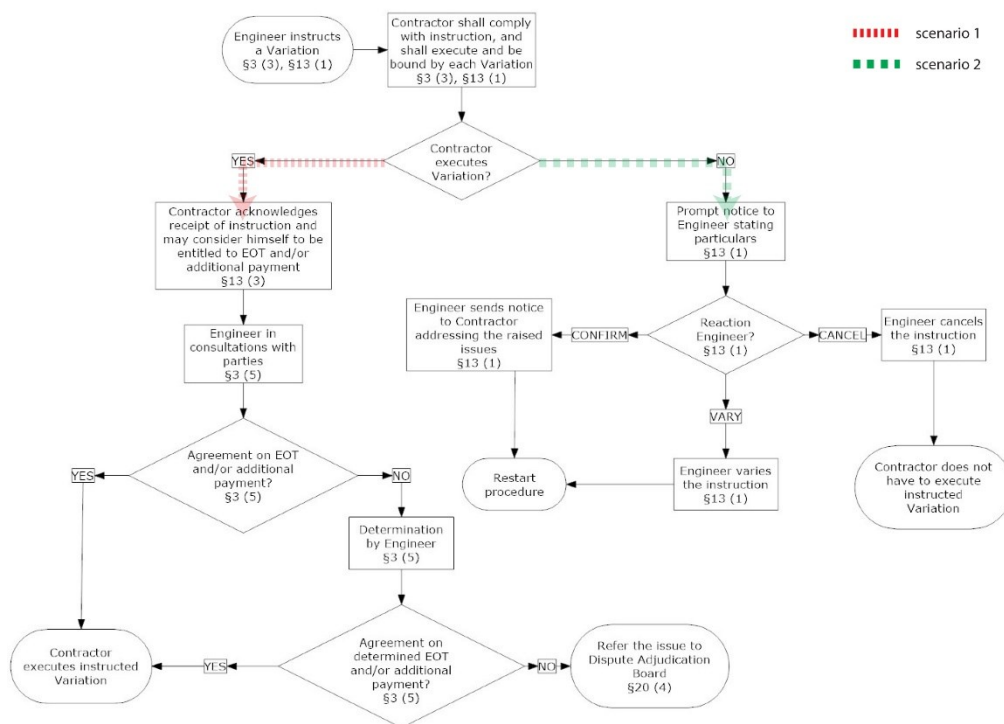


Figure 25: Procedure for a variation initiated by an instruction of the Engineer

Pursuant to §3 (3) and §13 (1), the Contractor is obliged to comply with the instructions given by the Engineer and to execute and be bound by each Variation, unless he has valid reasons for refusal. Therefore, the Contractor has two ways to react to the instructed variation: he may decide to carry out the Variation or not to carry out the Variation. The following steps in the procedure are dependent on the reaction of the Contractor, therefore different scenarios are possible:

Scenario 1 - The Contractor decides to carry out the Variation

If the Contractor decides to carry out the Variation, pursuant to §13 (3) he has to acknowledge receipt of the instruction. Dependent on the type of Variation the Contractor may be entitled to an extension of time and/or additional payment. The procedure of §3 (5) should be followed to agree or determine the adjustments to the Contract Price and the Schedule of Payments. §3 (5) reads as follows:

5. Whenever these Conditions provide that the Engineer shall proceed in accordance with this Sub-Clause 3.5 to agree or determine any matter, the Engineer shall consult with each Party in an endeavour to reach agreement. If agreement is not

achieved, the Engineer shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.

The Engineer shall give notice to both Parties of each agreement or determination, with supporting particulars. Each Party shall give effect to each agreement or determination unless and until revised under Clause 20 [Claims, Disputes and Arbitration].

So dependent on whether or not the parties can come to an agreement on this, different sub scenarios are possible:

- i. this is the easiest scenario. If the parties come to an agreement by consultations with the Engineer, then the Engineer will notify both parties of the agreement, the Contract Price and the Schedule of Payments will be adjusted according to the agreement, and the Contractor will execute the Variation;
- ii. if the parties do not come to an agreement by consultations with the Engineer, then the Engineer will make a fair determination of the adjustments to the Contract Price and the Schedule of Payments and each party is obliged to give effect to this determination;
- iii. if the parties still do not come to an agreement after the fair determination by the Engineer, then pursuant to §20 (4) either party may refer the dispute in writing to the Dispute Adjudication Board (DAB) for its decision. According to §20 (2), the DAB comprises one or three members who are appointed either before the Contractor commences executing the Works or only if and when a particular dispute arises. If either party is dissatisfied with the DAB's decision, then after following a certain procedure either party may commence arbitration of a dispute (§20 (4)).

Scenario 2 - The Contractor decides not carry out the Variation

§13 (1) sets out a rule that if the contractor refuses to carry out the ordered variation, he has to promptly give notice to the Engineer stating his reasons. The second paragraph of §13 (1) lays down possible grounds for refusal and reads as follows:

1. The Contractor shall execute and be bound by each Variation, unless the Contractor promptly gives notice to the Engineer stating (with supporting particulars) that (i) the Contractor cannot readily obtain the Goods required for the Variation, (ii) it will reduce the safety or suitability of the Works, or (iii) it will have an adverse impact on the achievement of the Schedule of Guarantees. Upon receiving this notice, the Engineer shall cancel, confirm or vary the instruction.

Subsequently, the Engineer has three ways to react to the contractor's notice: he may cancel, confirm or vary the instructed variation. The following steps in this scenario are dependent on the reaction of the Engineer, therefore different sub scenarios are possible:

- i. if the Engineer decides to cancel the instructed Variation, as a result the Contractor is not obliged to carry out the variation;
- ii. if the Engineer decides to confirm the instructed Variation, then the confirmation must be in writing and address the issues raised in the Contractor's notice. This may result in a restart of the procedure;
- iii. if the Engineer decides to vary the instructed Variation, this may result in a new Variation and a restart of the procedure.

Variation initiated by a request of the Engineer

Instead of an instruction, the Engineer may also request the Contractor to submit a proposal for a Variation. This way the Engineer and Contractor could reach prior agreement on the Variation's effect and thereby minimize dispute. The request for proposal does not constitute a Variation, but the proposal may be approved as a Variation.

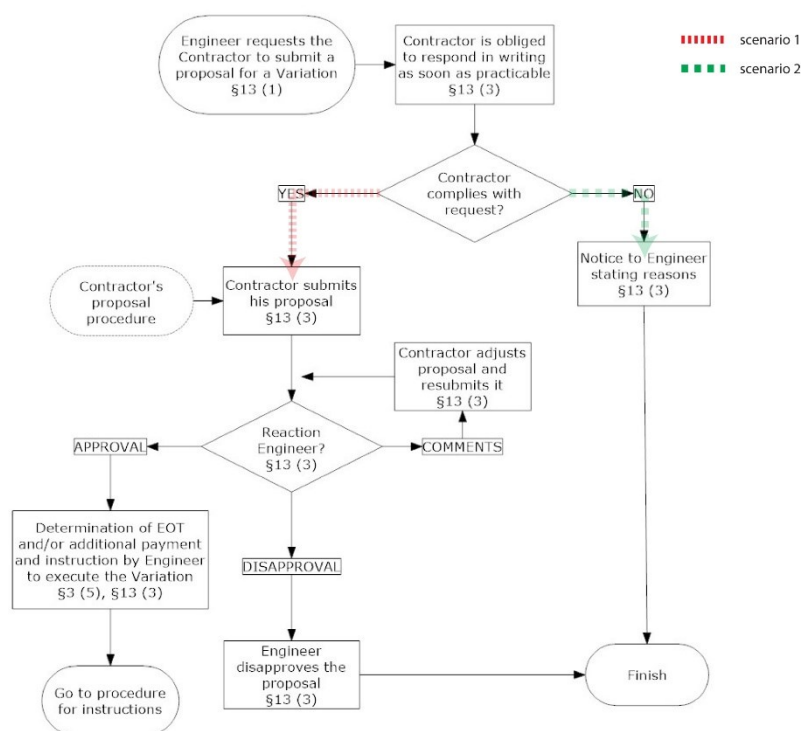


Figure 26: Procedure for a variation initiated by a request of the Engineer

The flowchart of Figure 26 gives an overview of the procedure for Variations initiated by a request for proposal of the Engineer and starts with 'Engineer requests the Contractor to submit a proposal for a Variation'. According to §13 (1), such a request by the Engineer has to meet the same requirements as an instruction: it should be ordered prior to issuing the Taking-Over Certificate for Works and it does not comprise the omission of any work which is to be carried out by others.

Pursuant to §13 (3), the contractor is obliged to respond in writing as soon as practicable. The contractor has two ways to react to the request for proposal: he may decide to comply with the request for proposal or not to comply with the request for proposal. The following steps in the procedure are dependent on the reaction of the Contractor, therefore different scenarios are possible:

Scenario 1 - The Contractor decides to comply with the request for proposal

§13 (3) lays down the documents the Contractor has to submit if he decides to comply with the request for proposal. The first paragraph of §13 (3) reads as follows:

1. If the Engineer requests a proposal, prior to instructing a Variation, the Contractor shall respond in writing as soon as practicable, either by giving reasons why he cannot comply (if this is the case) or by submitting:
 - (a) a description of the proposed design and/or work to be performed and a programme for its execution,
 - (b) the Contractor's proposal for any necessary modifications to the programme according to Sub-Clause 8.3 [Programme] and to the Time for Completion, and
 - (c) the Contractor's proposal for adjustment to the Contract Price.

Subsequently, the Engineer is obliged to respond as soon as practicable after receiving such proposal. He has three ways to react to the contractor's proposal: he may approve, disapprove or comment the proposal. The following steps in this scenario are dependent on the reaction of the Engineer, therefore different sub scenarios are possible:

- i. if the Engineer decides to approve the proposal, the procedure of §3 (5) should be followed to agree or determine the adjustments to the Contract Price and the Schedule of Payments. After agreement on this the Contractor will execute the Variation.
- ii. if the Engineer decides to disapprove the proposal, the Contractor will not execute the Variation. The Engineer may still instruct the Variation though.
- iii. if the Engineer has comments on the proposal, the Contractor could adjust his proposal and submit for approval.

Scenario 2 - The Contractor decides not to comply with the request for proposal

§13 (3) sets out a rule that if the contractor cannot comply with the request for proposal, he has to state his reasons in his notification to the Engineer. The Explanatory Notes to §13 (3) in (FIDIC, 2000) mention that the Contractor is required to respond to the request, but is not obliged to comply with it. In addition, the Contractor is not entitled to payment to prepare the proposal. This may be a reason for the Contractor not to comply with the request in case the Engineer for example requests detailed design drawings of a potential major Variation. The Engineer may still instruct the Variation though.

Variation initiated by a proposal of the Contractor

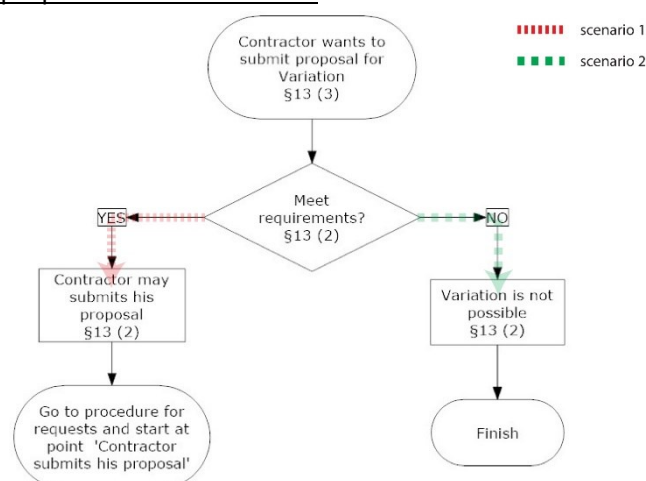


Figure 27: Procedure for a variation initiated by a proposal of the Contractor

At any time, a Variation may also be initiated by a proposal of the Contractor. The first paragraph of §13 (2) lays down the requirements such a Variation has to meet and reads as follows:

1. The Contractor may, at any time, submit to the Engineer a written proposal which (in the Contractor's opinion) will, if adopted,
 - (i) accelerate completion, (ii) reduce the cost to the Employer of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Employer of the completed Works, or (iv) otherwise be of benefit to the Employer.

The Variation could either meet or not meet the requirements, therefore two scenarios are possible:

Scenario 1 - The Variation meets the requirements stated in §13 (2)

If a Variation initiated by a proposal of the Contractor does meet the requirements stated in §13 (2), then the Contractor may proceed with submitting his proposal. From this moment on, the procedure will overlap with the procedure for Variations initiated by a request for proposal of the Engineer. Pursuant to the second paragraph of §13 (2), the Contractor is not entitled to payment for preparing the proposal and likewise as in the procedure of a requested proposal he has to include the items listed in §13 (3) in his proposal.

Scenario 2 - The Variation does not meet the requirements stated in §13 (2)

If a Variation initiated by a proposal of the Contractor does not meet the requirements stated in §13 (2), then the Variation will not be accepted by the Engineer.

18. Comparison contracts: Overview of trust building aspects

N/A = not applicable; ↓ = could be better to create trust; ↓↓ = creating distrust

Trust criteria	UAC-IC 2005	NEC3 ECC	FIDIC YB
(1) Trustworthiness of organization and the person during procurement: Track record, reputation, competences (financial, technical)	(1) Procurement Act 2012: Apply the MEAT award criterion. The criteria may only be related to the contract that is being rewarded ↓	N/A	N/A
(2) Trustworthiness during procurement: Culture, policy	(1) Public Works Procurement Regulations 2012: The 'open procedure' and the 'restricted procedure' may be used freely, the use of the other procedures is restricted ↓	N/A	N/A
(3) Joint goal setting	(1) Public Works Procurement Regulations 2012: Grounds for exclusion and minimum and/or suitability requirements merely lead to competence trust ↓	N/A	N/A
	(3) Good faith in Art. 6:2 and Art. 6:248 in the DCC: The parties have to take each other's reasonable interests into account	(3) Good faith in the NEC3 ECC: The parties have to take each other's reasonable interests into account	(3) No requirement in the FIDIC YB to take each other's reasonable interests into account promotes adversarial behaviours ↓↓
	N/A	(3) Option for partnering	N/A
	N/A	(3) Option for limiting the Contractor's standard of care	N/A
	(3) No other mutual objectives besides fitness for purpose ↓	(3) The fitness for purpose requirement is not explicitly stated in the NEC3 ECC ↓	(3) No other mutual objectives besides fitness for purpose ↓
(4) Clearly defined communication system	(4) Limited communication requirements and no communication system. The Employer may be reluctant to provide information ↓↓	(4) Extensive communication requirements, but no communication system ↓	(4) Some communication requirements, but no communication system ↓
(5) Joint problem-solving	(5) Mutual warning obligation for errors in Contractor's and Employer's documents, but no early warning for risks. The sanctions for both parties are unclear though ↓↓	(5) Mutual early warning for risks	(5) Warning obligation for errors in Employer's documents, but only early warning for risks by the Contractor. There is no sanction for failure though. ↓
	(5) Limited requirements to collaborate and to help resolve problems. Depending on the case, the principle of good faith in the DCC may lay down requirements on the parties to do so ↓	(5) Risk reduction meetings to resolve problems together	(5) Option to management meetings to solve problems together (5) The parties are fully responsible for their risks (i.e. find solutions or bear the consequences) ↓
	N/A	(5) Open book regarding the Contractor's cost data in Main Options C-F	N/A
	(5) Clear claims procedure, but the types of claims are not fully clear ↓	(5) The CE's procedure is too extensive and complicated ↓	(5) Clear Employer's and Contractor's claims procedures
	N/A	(5) The Project Manager's dual role (i.e. as the Employer's agent and as a certifier) in the CE's procedure ↓↓	(5) The Engineer's dual role (i.e. as the Employer's agent and as a certifier) in the claims procedures ↓↓
(6) Equitable risk allocation	(6) To a large extent the risks are allocated to the party best able to manage them	(6) Many risks are not allocated to the party best able to manage them as the Contractor's risks are too broadly formulated ↓	(6) To a large extent the risks are allocated to the party best able to manage them, except for the geotechnical conditions ↓
	(6) No risk sharing ↓↓	(6) Option to share the financial risk by means of a pain/gain share mechanism	(6) No risk sharing ↓↓
	(6) Ultimate risk allocation is unclear ↓	(6) Ultimate risk allocation is unclear due to the CE's ↓	(6) Ultimate risk allocation is unclear due to broad formulations ↓
(7) System for continuous improvement of the relationship (11) Emotional investments	N/A	(7+11) Option to measure the Contractor's performance by means of KPIs and incentives	N/A
(8) Reasonable behaviour	(8) Good faith in Art. 6:2 and Art. 6:248 in the DCC has three functions: interpretation, supplementation, and correction and limitation. The principle may not be fully effective as the UAC-IC 2005 do not refer to the DCC ↓	(8) The requirement for all parties to act as stated in the contract and in a spirit of mutual trust and co-operation	(8) No good faith requirement promotes adversarial behaviours ↓↓
	(8) The Employer may only instruct the Contractor to remove their representatives from the project, but not any member of their team ↓	(8) The Project Manager may instruct the Contractor to remove members of his team from the project	(8) The Engineer may instruct the Contractor to remove members of his team from the project
(10) Problem-solving at the lower levels	(10) By default, the Court of Arbitration is authorized to settle disputes. Option to authorize the DAB to settle disputes, but generally, employers do not apply this option ↓	(10) By default, the DAB is authorized to settle disputes. The board has to be set up before the starting date. Generally, parties often delete the DAB provisions	(10) By default, the DAB is authorized to settle disputes. The board may be set up from the outset or post-dispute. Generally, parties often delete the DAB provisions ↓
	N/A	(10) The Contractor loses his entitlement to compensation if he does not give a CE notification in time ↓↓	(10) Unequal treatment between the Employer and the Contractor regarding claims. The Contractor loses his entitlement to compensation if he does not give a claims notice in time ↓↓
	N/A	(10) Several deemed acceptances in the CE's procedure if the Project Manager does not reply in time ↓↓	N/A
Indecisive (no score)			
	-	(1+2) Trustworthiness (ability, integrity and predictability)	(1+2) Trustworthiness (ability, integrity and predictability)
	(7) Continuous improvement (system)	-	(7) Continuous improvement (system)
	(9) Communication (repeated fulfilment)	(9) Communication (repeated fulfilment)	(9) Communication (repeated fulfilment)
	(11) Continuous improvement (emotional investments)	-	(11) Continuous improvement (emotional investments)

19. Comparison contracts: Overview of efficiency and effectiveness creating aspects

N/A = not applicable

↓ = could be better to create an efficient and effective change management process

↓↓ = creating an efficient and effective change management process

CM criteria	UAC-IC 2005	NEC3 ECC	FIDIC YB
(2) Clearly defined change management procedure and roles or responsibilities therein	(2) Clear change management procedure and roles therein	(2) The change management procedure is too extensive and complicated ↓	(2) The change management procedure is open-ended sometimes ↓
	(2) Option to use provisional sums	N/A	(2) Option to use provisional sums
	N/A	(2) Open book regarding the Contractor's cost data in Main Options C-F	N/A
(3) Equitable risk allocation	N/A	(2) The Project Manager's dual role (i.e. as the Employer's agent and as a certifier) ↓↓	(2) The Engineer's dual role (i.e. as the Employer's agent and as a certifier) ↓↓
	(3) To a large extent the risks are allocated to the party best able to manage them	(3) Many risks are not allocated to the party best able to manage them as the Contractor's risks are too broadly formulated ↓	(3) To a large extent the risks are allocated to the party best able to manage them, except for the geotechnical conditions ↓
	(3) No risk sharing ↓↓	(3) Option to share the financial risk by means of a pain/gain share mechanism	(3) No risk sharing ↓↓
(4) Risk management system	(3) Ultimate risk allocation is unclear ↓	(3) Ultimate risk allocation is unclear due to the CEs ↓	(3) Ultimate risk allocation is unclear due to broad formulations ↓
	N/A	(4) The risk management procedure is open-ended ↓	(4) Very limited risk management procedure ↓↓
	N/A	(4) The NEC3 ECC promotes a proactive risk management approach	(4) The FIDIC YB promotes a reactive risk management approach ↓↓
(7) Early warning	(7) Early identification of variations due to errors, ambiguities etc. in the ER or an incomplete ER, but not due to risks ↓	(7) Early warning obligation for variations due to ambiguities in the contract documents and due to risks.	(7) Early identification of variations due to errors, ambiguities etc. in the ER or an incomplete ER, but ineffective early identification requirement of variations due to risks because there is no sanction for it ↓
(7-16) Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.	(7-16) Some standard change management processes are not explicitly stated in the UAC-IC 2005 ↓	(7-16) Some standard change management processes are not explicitly stated in the NEC3 ECC ↓	(7-16) Some standard change management processes are not explicitly stated in the FIDIC YB ↓
(8-9+15-16) Appropriate documentation of the change process	(8-9+15-16) Limited requirements to record all decisions in the change management process ↓	(8-9+15-16) Extensive requirements to record all decisions in the change management process, which may increase the administrative burden for all parties ↓	(8-9+15-16) Limited requirements to record all decisions in the change management process ↓
Indecisive (no score)			
	(1) Objectives	(1) Objectives	(1) Objectives
	(4) Risk management	N/A	N/A
	(5) Continuous improvement (review)	(5) Continuous improvement (review)	(5) Continuous improvement (review)
	(6) Continuous improvement (share knowledge)	(6) Continuous improvement (share knowledge)	(6) Continuous improvement (share knowledge)

20. Overview NEC2 ECC versus NEC3 ECC

This overview concerns the significant amendments between the two editions for this research. The provisions **highlighted in grey** are added and the ones in **BOLD** are amended. The following references were used for this overview: (Gerrard, 2005; Rowlinson, 2005a, 2005b, 2006).

Clause 16: EW obligation for increase Contractor's total cost and risk register added

EW also for matters which increase the Contractor's total cost.

- NEC3 ECC §16.1. 'The Contractor and the Project Manager give an early warning by notifying the other as soon as either becomes aware of any matter which could increase the total of the Prices, delay Completion, delay meeting a Key Date or impair the performance of the works in use. The Contractor may give an early warning by notifying the Project Manager of any other matter which could increase his total cost. The Project Manager enters early warning matters in the Risk Register. Early warning of a matter for which a compensation event has previously been notified is not required'.

The risk register is a new project management tool in the third edition.

- NEC3 ECC §16.4. 'The Project Manager **revises the Risk Register to record the decisions made at each risk reduction meeting and issues the revised Risk Register to the Contractor. If a decision needs a change to the Works Information, the Project Manager instructs the change at the same time as he issues the revised Risk Register**'.
- NEC3 ECC §11.2 (14). 'The Risk Register is a register of the risks which are listed in the Contract Data and the risks which the Project Manager or the Contractor has notified as an early warning matter. It includes a description of the risk and a description of the actions which are to be taken to avoid or reduce the risk'.

Clause 19: Force majeure provisions and a CE for such events added

Force majeure provisions are new.

- NEC3 ECC §19.1. 'If an event occurs which stops the Contractor completing the works or stops the Contractor completing the works by the date shown on the Accepted Programme, and which neither Party could prevent and an experienced contractor would have judged at the Contract Date to have such a small chance of occurring that it would have been unreasonable for him to have allowed for it, the Project Manager gives an instruction to the Contractor stating how he is to deal with the event.'

Force majeure events will be compensated by means of CEs.

- NEC3 ECC §60.1 (19). 'An event which stops the Contractor completing the works or stops the Contractor completing the works by the date shown on the Accepted Programme, and which neither Party could prevent, an experienced contractor would have judged at the Contract Date to have such a small chance of occurring that it would have been unreasonable for him to have allowed for it and is not one of the other compensation events stated in this contract.'

Option X20: New Secondary Option 'Key Performance Indicators'

Key performance indicators to measure the Contractor's performance during the project.

- NEC3 ECC §X20.1. 'A Key Performance Indicator is an aspect of performance by the Contractor for which a target is stated in the Incentive Schedule. The Incentive Schedule is the incentive schedule unless later changed in accordance with this contract'.
- NEC3 ECC §X20.2. 'From the starting date until the Defects Certificate has been issued, the Contractor reports to the Project Manager his performance against each of the Key Performance Indicators. Reports are provided at the intervals stated in the Contract Data and include the forecast final measurement against each indicator'.
- NEC3 ECC §X20.3. 'If the Contractor's forecast final measurement against a Key Performance Indicator will not achieve the target stated in the Incentive Schedule, he submits to the Project Manager his proposals for improving performance'.
- NEC3 ECC §X20.4. 'The Contractor is paid the amount stated in the Incentive Schedule if the target stated for a Key Performance Indicator is improved upon or achieved. Payment of the amount is due when the target has been improved upon or achieved'.
- NEC3 ECC §X20.5. 'The Employer may add a Key Performance Indicator and associated payment to the Incentive Schedule but may not delete or reduce a payment stated in the Incentive Schedule'.

Clauses 60-65: CEs for physical conditions and weather conditions clarified, time bar amended and deemed acceptances added

Compensation sum for physical conditions clarified.

- NEC3 ECC §60.1 (12). 'The Contractor encounters physical conditions which are within the Site, are not weather conditions and an experienced contractor would have judged at the Contract Date to have such a small chance of occurring that it would have been unreasonable for him to have allowed for them. **Only the difference between the physical conditions encountered and those for which it would have been reasonable to have allowed is taken into account in assessing a compensation event**'.

Compensation sum for weather conditions clarified.

- NEC3 ECC §60.1 (13). 'A weather measurement is recorded within a calendar month, before the Completion Date for the whole of the works and at the place stated in the Contract Data the value of which, by comparison with the weather data, is shown to occur on average less frequently than once in ten years. **Only the difference between the weather measurement and the weather which the weather data show to occur on average less frequently than once in ten years is taken into account in assessing a compensation event**'.

Time bar extended from two weeks to eight weeks and sanction added.

- NEC3 ECC §61.3. 'The Contractor notifies the Project Manager of an event which has happened or which he expects to happen as a compensation event if the Contractor believes that the event is a compensation event and the Project Manager has not notified the event to the Contractor. **If the Contractor does not notify a compensation event within eight weeks of becoming aware of the event, he is not entitled to a change in the Prices, the Completion Date or a Key Date unless the event arises from the Project Manager or the Supervisor giving an instruction, issuing a certificate, changing an earlier decision or correcting an assumption.**'

Deemed acceptance added for the notification.

- NEC3 ECC §61.4. 'If the Project Manager decides that an event notified by the Contractor arises from a fault of the Contractor, has not happened and is not expected to happen, has no effect upon Defined Cost, Completion or meeting a Key Date or is not one of the compensation events stated in this contract he notifies the Contractor of his decision that the Prices, the Completion Date and the Key Dates are not to be changed. If the Project Manager decides otherwise, he notifies the Contractor accordingly and instructs him to submit quotations. The Project Manager notifies his decision to the Contractor and, if his decision is that the Prices, the Completion Date or the Key Dates are to be changed, instructs him to submit quotations before the end of either one week after the Contractor's notification or a longer period to which the Contractor has agreed. If the Project Manager does not notify his decision, the Contractor may notify the Project Manager of his failure. A failure by the Project Manager to reply within two weeks of this notification is treated as acceptance by the Project Manager that the event is a compensation event and an instruction to submit quotations.'

Deemed acceptance added for the submitted quotation.

- NEC3 ECC §62.6. 'If the Project Manager does not reply to a quotation within the time allowed, the Contractor may notify the Project Manager of his failure. If the Contractor submitted more than one quotation for the compensation event, he states in his notification which quotation he proposes is to be accepted. If the Project Manager does not reply to the notification within two weeks, and unless the quotation is for a proposed instruction or a proposed changed decision, the Contractor's notification is treated as acceptance of the quotation by the Project Manager'.

Deemed acceptance added for the submitted quotation if the Project Manager fails to assess a CE within time.

- NEC3 ECC §64.4. 'If the Project Manager does not assess a compensation event within the time allowed, the Contractor may notify the Project Manager of his failure. If the Contractor submitted more than one quotation for the compensation event, he states in his notification which quotation he proposes is to be accepted. If the Project Manager does not reply within two weeks of this notification the notification is treated as acceptance of the Contractor's quotation by the Project Manager'.

Requirement added to look for different ways to deal with the CE jointly.

- NEC3 ECC §62.1. '**After discussing with the Contractor different ways of dealing with the compensation event which are practicable,** the Project Manager may instruct the Contractor to submit alternative quotations. The Contractor submits the required quotations to the Project Manager and may submit quotations for other methods of dealing with the compensation event which he considers practicable.

Options W1 and W2: Dispute resolution provisions revised

Dispute resolution was dealt with under Core Clause 9 in the NEC2, but this aspect is covered by Options W1 and W2 in the NEC3.

21. List of interviewees

Project	#	Interviewee/Participant	Role	Company
Bijlmerweide	1E	Martin van den Berg	Project manager	Stadsdeel Zuidoost
	2E	Peter Berkhout	Contract manager	Stadsdeel Zuidoost
	3P	Reinoud Hanlo	Project leader	RHDHV
	4C	Erwin Stuart	Project manager	KWS
		Wilbert Hogewij	Project manager	Hofmeijer
		Chiel Hofmeijer	Design manager	Hofmeijer
Drachtsterweg	1E	Sieds Hoitinga	Program manager	Provincie Fryslân
	2E	Edward Herzog	Assistant project manager	Provincie Fryslân
	3E	Thedo Mienstra	Assistant technical project leader	Provincie Fryslân
	4P	Jörgen Kleinheerenbrink	Technical project leader/ Contract manager	RHDHV
	5P	Michael Freerks	Process manager	RHDHV
	6P	Rob Tomasouw	Risk manager	RHDHV
	7C	André Plagmeijer	Project manager	Heijmans
	8C	Rolf Drijfhout van Hooff	Process manager	Heijmans
	9C	Jaap Springelkamp	Variations manager	Heijmans
	10C	René Rozendal	Contract specialist	Heijmans
Forres	1E	David Gowans	Project Director	The Moray Council
	2P	Barbara Hellett	ECC project manager	The Moray Council/RHDHV
	3P	Briony Hall	ECC supervisor	The Moray Council/RHDHV
	4I	Neil Mackay	Cost consultant	EC Harris
	5C	Ian Mackay	Construction manager	Morrison Construction
	6C	Ryan Main	Commercial manager	Morrison Construction
Dikkowita	1P	Herald Vervoorn	FIDIC engineer	RHDHV
	2P	Andrew Cook	Contract specialist	RHDHV
	-	Sarath Kumara de Silva	Project director PIU	MFARD Sri Lanka
FIDIC control group	1	Geert Hendriks	FIDIC expert / FIDIC engineer	RHDHV
	2	Berend van Bon	FIDIC expert / FIDIC engineer	RHDHV
	3	Rob Brouwer	FIDIC expert / FIDIC engineer	RHDHV
	4	Arco van der Toorn	FIDIC expert / FIDIC engineer	RHDHV
	5	René van Voorst	FIDIC expert	RHDHV

E = Employer's team

P = Project Manager's team

I = Independent Cost Consultant's team

C = Contractor's team

- = no co-operation

22. Example of an interview agenda

INTERVIEW AGENDA

Interview:	Project Forres (River Findhorn & Pilmuir) Flood Alleviation Scheme
Date of interview (DD/MM/YYYY):	29-10-2014
Time:	09.00 – 11.00h
Location:	Site Compound (29 West Road, Forres)
Interview planned by:	Lonneke Cheung

1. Interview objective

The Master Thesis research concerns the comparison of the UAC-IC 2005 contract (Dutch contract) with the two international construction contracts NEC3 ECC and FIDIC yellow book with regard to the subjects ‘trust’ and ‘changes’. I have selected one case study project for each contract (for the Dutch contract two):

- UAC-IC: Project Bijlmerweide, Amsterdam, The Netherlands
- UAC-IC: Project Drachtsterweg, Leeuwarden, The Netherlands
- FIDIC: Project Dikkowita Fishery Harbour, Dikkowita, Sri Lanka
- NEC: Project Forres Flood Alleviation Scheme, Forres, Scotland

Prior to the interview, I analyzed the standard forms of contract and the project records on the basis of an assessment model. The objective of the interviews with the Employer and the Contractor is to validate this theoretical analysis by researching how certain contract clauses and project management processes work in practice. The next step of the research is to compare the 4 case study results and to draw conclusions and recommendations from these.

2. Attendees

Initials	Name	Role/Function	Company	Email
LC	Lonneke Cheung	Graduate Intern	TU Delft/RHDHV	###@###
BH	Barbara Hellett	‘The Project Manager’	RHDHV	###@###

3. Interview agenda

Subject	Owner	Time	
a. Opening:	LC	09.00	–
▪ Introduction (role/function)		09.15h	
▪ Explain research (subject, case study design)			
▪ Explain interview setup (goal, duration, question setup)			
b. Interview questions concerning aspects related to ‘trust’:	LC	09.15	–
▪ Trustworthiness (during procurement), project objectives, communication, problem-solving, risk allocation, continuous improvement		10.00h	
c. Interview questions concerning aspects related to ‘changes’:	LC	10.00	–
▪ Project objectives, change management procedure, risk allocation, risk management, learning from changes		10.45h	
d. Additional interview questions about ‘trust’ and ‘changes’	LC	10.45	–
		10.55h	
e. Closing:	LC	10.55	–
▪ Data analysis, report, validation, anonymity		11.00h	
▪ Questions by email			

4. Preparation

Description	Prepared by
Questionnaire	LC

23. Bijlmerweide: Interview questionnaire

Opening (09.00 – 09.15u)

- Kennismaken (rol/functie)
- Uitleg onderzoek (onderwerp, case study opzet)
- Uitleg interview opzet (doel, duur, opzet vragen, data analyse)

Vragen trust (09.15 – 10.00u)

Q1.Q2.Trustworthiness

Trustworthiness	(1) Seek partner with good track record, reputation and competence of financial and risk management
	(2) Seek partner with similar culture/policy
	(8) Reasonable behaviour (=working fairly and professionally)

De eerste vragen gaan over de aanbesteding. Was u zelf betrokken bij de aanbestedingsfase? (verder als JA)

09.15 (1)+(2) Volgens de Inschrijvings- en Gunningsleidraad was de aanbestedingsprocedure meervoudig-onderhands, waarbij de OG drie tot en met 5 aannemers uitnodigt om een inschrijving te doen (ARW 2012). OG heeft een aantal facultatieve uitsluitingsgronden toegepast, zoals omkoping, witwassen van geld, faillissement en belastingschuld. Verder zijn er geen geschiktheidseisen gesteld met betrekking tot bijvoorbeeld financiële en economische draagkracht en technische bekwaamheid. De Economisch Meest Voordelige Inschrijving (EMVI) werd bepaald aan de hand van kwalitatieve en financiële gunningscriteria. Voor het kwalitatieve deel werd het Plan van Aanpak beoordeeld op de aspecten project planning, werken in een kwetsbaar gebied, werkzaamheden in de meerjaren onderhoudsperiode en uitwerking grondkerende oeverbeschoeiing. Het financiële deel bestond uit de inschrijfsommen voor het ontwerp, de realisatie en de opleverdossiers.

1. OG: Welke factoren waren van belang bij het selecteren van de aannemers?
2. OG: Waren de uitsluitingsgronden en het Plan van Aanpak voldoende om te bepalen hoe betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) de aannemers zijn om het werk uit te voeren?
3. ON: Waren de uitsluitingsgronden en het Plan van Aanpak voldoende om aan te tonen dat de aannemer betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) is om het werk uit te voeren? (Proportioneel aan het werk dat uitgevoerd moet worden)
4. De uitsluitingsgronden en de eisen m.b.t. het Plan van Aanpak werden gesteld aan de organisatie. Is er ook op persoonlijk niveau onderzocht door de OG in hoeverre de vertegenwoordigers van de ON betrouwbaar zijn?

>eerst naar Q3 objectives

09.25 (8) Deze vraag gaat over redelijk gedrag. OG en ON worden beschermd tegen opportunistisch gedrag van de ander door 'redelijkheid en billijkheid' uit het Burgerlijk Wetboek (BW). Daarnaast komt het aspect ook terug in de doelstellingen die geformuleerd zijn door de OG met betrekking tot de samenwerking tussen OG en ON. Het gaat onder andere om 'open houding, flexibiliteit', 'inlevingsvermogen/empathie' en 'goede samenwerking'.

1. Heeft 'redelijkheid en billijkheid' uit het BW invloed op het gedrag van OG en ON?
2. Hebben de samenwerkingsdoelstellingen invloed op het gedrag van OG en ON?

Q3. Objectives

Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)

09.20 (3) Deze vraag gaat over de projectdoelen. Tijdens het overleg tussen OG en RHDHV van 10 maart 2014 zijn doelstellingen geformuleerd met betrekking tot de samenwerking tussen OG en ON. Het gaat onder andere om 'open houding, flexibiliteit', 'heldere communicatielijnen', 'inlevingsvermogen/empathie', 'elkaars ambities en concrete doelen kennen', 'elkaar vroegtijdig informeren' en 'aantal escalaties naar management minimaal'. Deze doelstellingen zouden tijdens het startoverleg met de ON nader besproken en uitgewerkt worden. In het verslag van het startoverleg vind ik echter alleen doelstellingen met betrekking tot het projectresultaat (hanteren kwaliteitsmanagement, omgevingsmanagement en techniek) en mis ik concrete samenwerkingsafspraken tussen OG en ON.

1. Zijn deze samenwerkingsafspraken tussen OG en ON wel gemaakt? Worden deze nagekomen door beide partijen?
2. Worden de afspraken met betrekking tot het project resultaat nagekomen door OG en ON?

>terug naar Q1 trustworthiness

Q4.Q5. Communication

Communication	(4) Clearly defined system of communication procedures and approaches
	(9) Repeated fulfilment of communications/interactions

09.30 (4) De volgende twee vragen gaan over communicatie tussen OG en ON. In de Vraagspecificatie zijn eisen (2, 18, 24, 30) opgesteld met betrekking tot communicatie en informatie tussen OG en ON. Deze eisen zijn vervolgens uitgewerkt tot concrete plannen door de ON in het Projectkwaliteitsplan. Het gaat onder andere om een overlegschema, voortgangrapportages en documentensysteem.

1. Houden OG en ON zich aan deze communicatie- en informatieplannen tijdens het project? (Problemen?)

09.35 (9) Naast formele communicatie is informele communicatie ook erg belangrijk in een project.

1. Is er naast de formele vergaderingen ook informeel contact tussen OG en ON?

Q6. Problem solving

Problem solving	(5) Adopt joint problem-solving philosophy
	(10) Problem-solving to mutual satisfaction at the lower levels

09.40 (5) + (10) Deze vraag gaat over problemen oplossen. Volgens de Basisovereenkomst art. 18 worden geschillen niet ter beslechting voorgelegd aan de Raad van Deskundigen. In plaats daarvan is een artikel opgenomen waarin staat dat geschillen beslecht worden door de rechtelijke macht te Amsterdam. Daarnaast had de OG een aantal doelstellingen met betrekking tot problemen oplossen: 'elkaar vroegtijdig informeren', 'geen verassingen' en 'aantal escalaties naar management minimaal'.

1. Waarom is ervoor gekozen om de Raad van Deskundigen niet in schakelen voor geschillenbeslechting? Welke problemen worden hiermee opgelost of vermeden?
2. Wat wordt er tijdens het project gedaan om problemen op te lossen op het eerste niveau, dus zonder te escaleren naar management? (vroegtijdig informeren?/risk management?/hulp?)
3. Zijn tot nu toe alle problemen op het eerste niveau opgelost?

Q7. Risk allocation

Risk allocation	(6) Draft a clear, unambiguous and equitable contract

09.45 (6) Deze vraag gaat over risicoverdeling. §13 en §41 uit het UAC-IC 2005 behandelen de risicoverdeling met betrekking tot respectievelijk de bodemaspecten en schade aan het werk. De complete risicoverdeling tussen OG en ON is opgenomen in het risicodossier van de OG. De OG lijkt de meeste risico's te dragen, de ON de grootste risico's en ongeveer 1/3 van het aantal risico's wordt gedragen door OG/ON.

1. Hoe is bepaald wie de risicodragers is? Worden risico's zoveel mogelijk doorgeschoven naar de andere partij? Worden risico's toebedeeld aan de partij die het beste in staat is om deze te beheren?
2. Bij heel veel risico's staat dat de risicodragers OG/ON is. Betekent dit dat de risico's gedeeld worden door OG en ON qua aansprakelijkheid? (delen van de verliezen en de winsten)
3. xWordt de partij beloond voor het dragen van een risico?

Q8. Continuous improvement

Continuous improvement	(7) Agreed system for achieving continuous improvement of the relationship
	(11) Emotional investments (e.g. by formalized team building workshops)

09.50 (7)+(11) Deze vraag gaat over het continu verbeteren van de relatie tussen OG en ON. In het UAC-IC 2005 en de project documenten heb ik niks kunnen vinden over dit onderwerp.

1. Zijn er meetings of workshops geweest ten behoeve van het verbeteren van de relatie tussen OG en ON? (Deed iedereen serieus mee?/Worden gemaakte afspraken nagekomen?)
2. Is er een systeem of zijn er maatregelen afgesproken tussen OG en ON ten behoeve van het verbeteren van de relatie?

Q9. Other systems or processes

09.55 De gestelde vragen over vertrouwen hadden allemaal betrekking op systemen en processen die volgens de literatuur relevant zijn voor het creëren en behouden van vertrouwen tussen de partijen. (Zie 1.4 voor lijst componenten)

1. Zijn er overige systemen of processen in het project die relevant zijn voor het creëren en behouden van vertrouwen tussen OG en ON?

Vragen change management (10.00– 10.35u)

Q1. Objectives

Anticipate change	(1) Align project goals and objectives

10.00 (1) De eerste vraag gaat over de doelstellingen met betrekking tot wijzigingenbeheer. Eén van de doelstellingen van de OG met betrekking tot de samenwerking met ON was 'heldere afspraken over vtw's/meerwerk'. In de project documenten heb ik niks kunnen vinden hierover.

1. Zijn er afspraken gemaakt tussen OG en ON met betrekking tot vtw's/meerwerk? Worden deze afspraken nagekomen?
2. Zijn er afspraken gemaakt tussen OG en ON met betrekking tot risk management? Worden deze afspraken nagekomen?

Q2. Risk allocation

Anticipate change	(3) Agree on project philosophy with regard to risk allocation and type of changes to consider

Zie Q5 van trust.

Q3. Risk management

Anticipate change	(4) Prior identification of areas where changes likely occur (e.g. by risk management)

10.05 (4) Deze vraag gaat over risk management. In de Vraagspecificatie zijn eisen (10-12, 28) opgesteld voor risk management uit te voeren door de ON tijdens het project. Deze eisen zijn vervolgens uitgewerkt tot concrete plannen door de ON in het Projectkwaliteitsplan. Het gaat onder andere om het opstellen en bijhouden van een risicoregister, het analyseren van risico's, beheersmaatregelen treffen en bespreking van risico's tijdens voortgangsoverleg. Daarnaast houdt OG een eigen risicoregister bij.

1. Houden OG en ON zich aan deze risk management plannen tijdens het project?
2. In hoeverre worden risico's proactief aangepakt? (geheel reactief, grotendeels reactief, half reactief/half proactief, grotendeels proactief, geheel proactief)

Q4.Q5.Q6. Change management procedure

Anticipate change	(2) Clearly defined change management procedures and processes and roles and responsibilities therein (3) Agree on project philosophy with regard to risk allocation and type of changes to consider
Recognize change	(8) Early identification of potential changes (9) Standard change management process: Assess potential impact (e.g. by value engineering) and create a proposed change order (10) Standard change management process: Document the proposed change in a log
Evaluate change	(11) Standard change management process: Determine priority of the change (12) Standard change management process: Selection of optimum change options by consulting all relevant parties (13) Standard change management process: Identify the likely impacts of different change options (14) Standard change management process: Prompt decision making with due authority as to whether to accept/reject the change
Resolve change	(15) Standard change management process: Communicate final change decision to all team members whose work is affected by it (16) Appropriate documentation to record all decisions within the change process
Monitor implementation	(5) Monitor and record implementation

10.10 (2) + (3) De komende vragen gaan over de wijzigingsprocedure. In het Projectkwaliteitsplan en het Organisatieschema SCB is de procedure voor Verzoek Tot Wijziging (VTW) opgenomen: OG/ON dient VTW formulier in bij projectleider ON, berekening van de consequenties, opnemen in wijzigingsoverzicht, indienen bij OG, accepteren of afwijzen, besluit opnemen in wijzigingsoverzicht. Deze VTW-procedure lijkt af te wijken van de wijzigingsprocedure die is opgenomen in §14, §15 en §45 van het UAC-IC 2005. De VTW-procedure begint bijvoorbeeld al gelijk met het indienen van een prijsaanbieding in plaats van dat er eerst bepaald wordt of de ON überhaupt verplicht is de wijziging uit te voeren.

1. Waarom is ervoor gekozen om af te wijken van de wijzigingsprocedure in het UAC-IC 2005? Welke problemen worden hiermee opgelost of vermeden?
2. Welke sub clausules van §14, §15 en §45 van het UAC-IC 2005 zijn nog wel van toepassing?
3. Houden OG en ON zich aan deze VTW-procedure tijdens het project?
4. xHoe efficiënt en effectief werkt deze VTW-procedure tijdens het project? (Zijn er problemen?/Zijn alle rollen en verantwoordelijkheden duidelijk?)

10.15 (8) Volgens het UAC-IC 2005 §4 (7) is de ON verplicht de OG te waarschuwen voor klaarblijkelijke fouten in onder andere de Vraagspecificatie, de Basisovereenkomst, ter beschikking gestelde informatie en goederen van de OG, en opgedragen wijzigingen door de OG. Daarnaast had de OG de doelstelling 'elkaar vroegtijdig informeren'.

1. In hoeverre worden wijzigingen proactief aangepakt? (geheel reactief, grotendeels reactief, half reactief/half proactief, grotendeels proactief, geheel proactief)

10.20 (5) + (9-16) De VTW-procedure geeft niet de gedetailleerde stappen weer. Daarom volgt nu een vraag hierover.

1. Zijn de volgende activiteiten onderdeel van de VTW-procedure?

Recognize change	8.	Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	x
	9.	Het wijzigingsvoorstel opnemen in een logboek	x
Evaluate change	10.	De prioriteit van de wijziging bepalen	-
	11.	Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	-
	12.	De impacts van de verschillende wijzigingsopties bepalen	x
	13.	Snelle besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	x
Resolve change	14.	Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	-
	15.	Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	x
Monitor implementation	5.	De uitvoering van de wijziging monitoren en documenteren.	-

Q7. Continuous improvement

Learn from change	(6) Conduct a review and create lessons learned from the change event
	(7) Update shared databases and incorporate lessons learned for project and organization

10.25 (6)+(7) Deze vraag gaat over leren van de wijziging. In het UAC-IC 2005 en de project documenten heb ik niks kunnen vinden over het leren van wijzigingen en het delen van deze kennis.

- Worden tijdens het project 'lessons learned' gecreëerd van wijzigingen en wordt deze kennis gedeeld tussen OG en ON?
- xWordt de effectiviteit van de risk management processen tijdens het project gemeten en bijgestuurd?

Q8. Other systems or processes

10.30 De gestelde vragen over wijzigingen hadden allemaal betrekking op systemen en processen die volgens de literatuur relevant zijn voor het een efficiënt en effectief wijzigingsproces. (Zie 1.4 voor lijst componenten)

1. Zijn er overige systemen of processen in het project die relevant zijn voor de efficiëntie en effectiviteit van het wijzigingsproces?

Extra vragen losstaand van het project (10.35 – 10.50u)

10.35 TRUST:

1.	Betrouwbaarheid organisatie: Track record, reputatie, competenties (financieel, technisch)
2.	Betrouwbaarheid persoon: Track record, reputatie, competenties (financieel, technisch)
3.	Betrouwbaarheid: Cultuur, beleid
4.	Gedeelde projectdoelen
5.	Duidelijk communicatiesysteem
6.	Samen problemen oplossen
7.	Eerlijke/proportionele risicoverdeling
8.	Systeem voor continu verbeteren van de relatie
9.	Veel communicatie en interacties
10.	Problemen oplossen op het eerste niveau
11.	Emotionele investeringen
12.	Redelijk gedrag

Q11. Effectiveness of the systems or processes

1. Welke systemen of processen zijn het meest effectief geweest voor het creëren en behouden van vertrouwen tussen OG en ON? (Ranking maken met de besproken aspecten in de vorm van kaartjes, extra blanco kaartjes voor eventuele aanvulling)

Q12. Trust clauses in contracts

1. Welke systemen of processen zou u opnemen in het contract met betrekking tot vertrouwen tussen OG en ON? (Kiezen uit de besproken aspecten en eventuele aangevulde aspecten)

10.40 CHANGE MANAGEMENT:

1. Gedeelde projectdoelen voor wijzigingenbeheer & risicomanagement
2. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
3. Eerlijke/proportionele risicoverdeling
4. Risicomanagement systeem
5. Leren van wijzigingen en kennis hiervan delen
6. Vroegtijdige waarschuwingsplicht
7. Adequate documentatie van de wijziging
8. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren

Q9. Importance of the systems or processes

1. Welke systemen of processen zijn het belangrijkste voor de efficiëntie en effectiviteit van het wijzigingenproces? (Ranking maken met de besproken aspecten in de vorm van kaartjes, extra blanco kaartjes voor eventuele aanvulling)

Q10. Change clauses in contracts

1. Welke systemen of processen zou u opnemen in het contract met betrekking tot wijzigingen? (Kiezen uit de besproken aspecten en eventuele aangevulde aspecten)

10.45 INVLOED

Q11. Influence of trust on effectiveness and efficiency of change management process

De onderwerpen 'vertrouwen' en 'wijzigingen' zijn bewust gekozen voor dit afstudeeronderzoek en staan niet los van elkaar. Het hoofddoel van het onderzoek is om te onderzoeken hoeveel invloed het vertrouwensniveau tussen OG en ON heeft op de effectiviteit en efficiëntie van het wijzigingenproces.

Effectiviteit (=doeltreffendheid) is een indicator voor de mate dat het doel bereikt is = $\frac{\text{werkelijke prestatie}}{\text{normatieve prestatie}}$

Efficiëntie (=doelmatigheid) is een indicator voor de hoeveelheid middelen die ingezet zijn om het doel te bereiken = $\frac{\text{feitelijke inspanning}}{\text{normatieve inspanning}}$

1. Voor hoeveel % wordt de effectiviteit van het wijzigingenproces beïnvloed/bepaald door het vertrouwensniveau tussen OG en ON?
2. Voor hoeveel % wordt de efficiëntie van het wijzigingenproces beïnvloed/bepaald door het vertrouwensniveau tussen OG en ON?

(0% geen invloed, 25% weinig invloed, 50% veel invloed, 75% heel veel invloed of 100% compleet beïnvloed)

Afsluiting (10.50 – 11.00u)

- Verslag en validatie
- Anonimiteit?
- Eventueel overige vragen per mail
- Verbeteringen interview?
- Onderzoeksrapport opsturen

24. Bijlmerweide: Interview reports

INTERVIEW VERSLAG #1E

Interview:	Project Bijlmerweide t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	26-09-2014
Tijd:	10.00 – 12.00u
Locatie:	Stadsdeelkantoor Zuidoost (Anton de Komplein 150)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	24-11-2014
Gevalideerd (DD/MM/JJJJ):	27-11-2014

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
MB	Martin van den Berg	Projectmanager	Stadsdeel Zuidoost	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
- De factoren die van belang waren bij het selecteren van de aannemers: werkervaring met groenwerkzaamheden, eerder mee samengewerkt. - De betrouwbaarheid van de aannemers wordt in eerste instantie getoetst bij de voorselectie. De uitsluitingsgronden en het Plan van Aanpak waren hiernaast voldoende om te bepalen hoe betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) de aannemers waren om het werk uit te voeren. De eisen voor het PvA waren o.a. gericht opgesteld om de betrouwbaarheid te toetsen. - Het bepalen van de fictieve korting voor het PvA was belangrijk om een goede prijs-kwaliteitverhouding te krijgen van de aannemers. Aannemers zijn hierdoor gedwongen om naast prijs kwaliteit te leveren. - In het contract zijn hiernaast eisen gesteld aan de werknemers van de ON die buiten zouden werken. Deze moesten ervaring hebben met groenwerkzaamheden.	
Redelijk gedrag	
Redelijkheid en billijkheid heeft invloed op het gedrag van de partijen vooral als het gaat om meerwerk of veiligheid, omdat je niet alles vast kan leggen in het contract. Hierdoor is er vaak een grijs gebied waarover de partijen in discussie moeten gaan. Als de ON redelijk gedrag en goodwill vertoont, zal de OG dit ook doen door bijvoorbeeld meer flexibel om te gaan met meerwerk.	
Projectdoelen	
- Ik was niet betrokken bij de Project Start Up met de aannemer. Het zou kunnen dat er <u>geen</u> concrete samenwerkingsafspraken zijn vastgelegd tijdens de PSU, dit zou ik moeten navragen bij de projectleider (Peter Berkhout). Ik weet wel dat de communicatie een open structuur heeft, hierdoor is het makkelijk om problemen met elkaar te bespreken. - Tot nu toe worden de afspraken die tijdens de PSU zijn gemaakt m.b.t. het projectresultaat nagekomen door de ON. De auditresultaten m.b.t. het kwaliteitsmanagement systeem van ON waren positief.	
Communicatie	
- De partijen houden zich aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Tot nu toe worden alle documenten op tijd aangeleverd, deze worden ook altijd besproken tijdens de vergaderingen. Het documentensysteem VISI is opgezet en werkt goed. - Er is veel informeel contact tussen OG en ON. Dit is efficiënt als er even snel iets geregeld moet worden zoals notulen schrijven of behandelen van een klacht van een bewoner.	
Problemen oplossen	
- Ik weet niet waarom ervoor gekozen is om de Raad van Deskundigen niet in te schakelen voor geschillenbeslechting. De rechtbank van Amsterdam is gekozen omdat dit wordt geadviseerd door afdeling Juridische Zaken. - Het oplossen van problemen op het eerste niveau gebeurt door ze snel bespreekbaar te maken via de telefoon / mail of tijdens bouwvergaderingen. Tijdens de bespreking staan de partijen open voor elkaars argumenten en wordt er samen gezocht naar een oplossing. - De stap naar de rechter is heel groot vanwege tijd en geld. Daarom zal deze stap alleen genomen worden wanneer we er echt niet gezamenlijk uitkomen en / of bij conflicten die om veel geld (relatief t.o.v. projectomvang) gaan. - Tot nu toe zijn alle problemen op het eerste niveau opgelost. Er zijn wel risico's geëscaleerd naar RWS, zoals het risico m.b.t. de kwel.	
Risicoverdeling	
- Bij het bepalen van de risicodragers worden zoveel mogelijk risico's doorgeschoven naar de ON, maar hierbij wordt wel gekeken of de ON de risico's kan beheeren. Als OG het risico zelf het beste kan beheeren, dan houdt OG deze voor zichzelf. - Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. Er zijn wel Top-risico's te bedenken waarvan bepaalde taken en verantwoordelijkheden verdeeld zijn onder de opdrachtgever en opdrachtnemer. Ieder is verantwoordelijk voor zijn eigen onderdeel. De verantwoordelijkheid hangt af van de projectfase en wie de plannen heeft uitgewerkt. - De ON wordt beloond voor het dragen van risico's via een risicoservering in de inschrijfsom die logischerwijs van te voren bekend dienen te zijn. Aanvullende werkzaamheden en daarmee gepaard gaande risico's dienen als Voorstel Tot Wijziging (VTW) tijdens het project door de ON te worden afgeprijsd.	
Continu verbeteren van de relatie	
Tijdens het project zijn <u>geen</u> meetings of workshops geweest en er zijn ook <u>geen</u> maatregelen afgesproken tussen OG en ON ten behoeve van het verbeteren van de relatie. Deze zijn ook niet nodig vanwege de open communicatie structuur. Problemen m.b.t.	

de relatie worden besproken. Wanneer de communicatie volgens de opdrachtgever niet loopt zoals gewenst kunnen hier aanvullende afspraken over worden gemaakt. ▪ Aan het einde van het project is er een eindevaluatie gepland. Dit is een eigen proces van het Stadsdeel en staat los van de tevredenheidsverklaring. Voor de evaluatie gaan OG en ON in gesprek met elkaar over mogelijke verbeterpunten vooral over de interne procedures en de soft skills. Bevindingen worden gebruikt voor toekomstige projecten, maar worden (nog) niet gedeeld binnen de organisatie.
Overige systemen of processen
▪ Er zijn voor zover ik weet <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON. ▪ Aanvulling op 'betrouwbaarheid: cultuur en beleid': Sinds de bouwfraude is de relatie tussen OG en ON formeler geworden.

3. Antwoorden op de interviewvragen over 'wijzigingen'	
Projectdoelen	
▪ De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn <u>niet</u> afgestemd op elkaar. Het is vanzelfsprekend dat OG geen VTW's en meerwerk wil. Het minimaliseren of limiteren van het aantal VTW's is niet mogelijk als doelstelling omdat de opkomst van een wijziging afhangt van hoe goed het contract is opgesteld en / of aanvullend werk wordt gevraagd van de opdrachtnemer. Als iets niet is voorzien in het contract, is een wijziging noodzakelijk om tot het projectresultaat te komen. Het afwijzen van een VTW vanwege een quotum is daarom niet mogelijk. ▪ Bij de beoordeling van VTW's speelt redelijkheid en billijkheid een rol. Er wordt gekeken naar of de ON de wijziging tijdens de aanbestedingsfase had kunnen zien aankomen of niet.	
Risico management	
▪ In de voorbereidingsfase ben ik actief betrokken geweest bij het risicomanagement. Het risicodossier van de OG wordt gedurende de uitvoering regelmatig bijgehouden door de projectleider (Peter Berkhout). De toprisco's van de opdrachtnemer worden opgenomen in de bouwverslagen. ▪ De toprisco's worden proactief aangepakt.	
Wijzigingsprocedure	
▪ De gebruikte VTW-procedure wijkt gedurende de uitvoering iets af van de wijzigingsprocedure uit het UAV-GC 2005 (par. 14, 15 en 45). Reden hiervoor is omdat de UAV-GC soms wat omslachtig kan zijn wanneer het gaat om het goedkeuren van een VTW. Wanneer de exacte lijnen van goedkeuring worden doorlopen kost dit (veel) tijd. Om deze reden wordt voorafgaand aan de offerte de potentiële VTW eerst met OG overlegd. ▪ Ik weet niet welke sub clausules par. 14, 15 en 45 uit het UAV-GC 2005 dan nog wel gebruikt worden. ▪ Wijzigingen worden proactief gesignaleerd en aangepakt. ▪ De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:	
9. Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10. Het wijzigingsvoorstel opnemen in een logboek	X
11. De prioriteit van de wijziging bepalen	X
12. Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	X
13. De impacts van de verschillende wijzigingsopties bepalen	X
14. (Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15. Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16. Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	X
6. De uitvoering van de wijziging monitoren en documenteren.	X
Opmerkingen: Bij 12, met de bewoners en beheerders.	
Continu verbeteren	
▪ Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Deze zouden wel meegenomen kunnen worden tijdens de eindevaluatie indien dit nodig is.	
Overige systemen of processen	
▪ Er zijn voor zover ik weet <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingsproces. ▪ Aanvulling op 'adequate documentatie van de wijziging': Het gebruik van VISI (=DMS) ▪ Aanvulling op 'het leren van wijzigingen en kennis hiervan delen': De eindevaluatie	

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)	
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):	
C	1. Betrouwbaarheid: cultuur, beleid
C	2. Redelijk gedrag
C	3. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
C	4. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
C	5. Samen problemen oplossen
C	6. Eerlijke/proportionele risicoverdeling
C	7. Gedeelde projectdoelen
C	8. Problemen oplossen op het eerste niveau
C	9. Duidelijk communicatiesysteem
	10. Systeem voor continu verbeteren van de relatie
	11. Emotionele investeringen
C	12. Veel communicatie en interacties
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):	
C	1. Risico management systeem
C	2. Vroegtijdige waarschuwingsplicht
C	3. Eerlijke/proportionele risicoverdeling
C	4. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
C	5. Leren van wijzigingen en kennis hiervan delen
C	6. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
C	7. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
C	8. Adequate documentatie van de wijziging
Invloed vertrouwen op wijzigingenproces	
De effectiviteit en de efficiëntie van het wijzigingenproces wordt voor <u>75%</u> bepaald door het vertrouwensniveau tussen OG en ON.	

INTERVIEW VERSLAG #2E

Interview:	Project Bijlmerweide t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	30-09-2014
Tijd:	15.30 – 17.30u
Locatie:	Stadsdeelkantoor Zuidoost (Anton de Komplein 150)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	24-11-2014
Gevalideerd (DD/MM/JJJJ):	26-11-2014

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
PB	Peter Berkhout	Contractmanager	Stadsdeel Zuidoost	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
- Ik was <u>niet</u> betrokken bij het selecteren van de aannemers voor de meervoudig-onderhandse aanbesteding. - Het Plan van Aanpak was voldoende om te bepalen hoe betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) de aannemers waren om het werk uit te voeren. De focus lag op de technische bekwaamheid met betrekking tot het werken met groen. - Op persoonlijk niveau zijn er tijdens de aanbesteding <u>geen</u> eisen gesteld aan de werknemers van de ON. Er werd alleen gevraagd om een Verklaring Omtrent Gedrag van de bestuurder.	
Redelijk gedrag	
Redelijkheid en billijkheid uit het BW heeft <u>geen</u> invloed op het gedrag van de partijen. Dit zijn principes die de mensen in dit project zelf hebben. OG en ON hebben een open relatie met elkaar en er is veel vertrouwen. Daarnaast blijkt dat de ON veel passie heeft in zijn werk en niet enkel uit is op geld. Het ontstaan van vertrouwen tussen OG en ON hangt echt af van de betrokken mensen. Zo is de OG bezig met een andere project (bruggen) op dezelfde locatie, maar met een andere aannemer. In dit project heeft de OG weinig vertrouwen in de aannemer, omdat deze steeds probeert de OG op te lichten.	
Projectdoelen	
- Er zijn <u>geen</u> concrete samenwerkingsafspraken vastgelegd tijdens de PSU. Er is wel nagevraagd of de ON ervaring heeft met het UAV-GC 2005 of er problemen mee heeft. - Tot nu toe worden de afspraken die tijdens de PSU zijn gemaakt m.b.t. het projectresultaat nagekomen door de ON, maar ik merk dat de ON soms moeite heeft om dingen aan te tonen. Eventuele problemen worden meestal informeel besproken.	
Communicatie	
- De partijen houden zich aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Aan het begin van het project waren er enkel problemen met het documentensysteem VISI. Het was te complex, te omslachtig en er waren te veel keuzemogelijkheden. - Er is heel veel informeel contact tussen OG en ON via de telefoon, de mail of meetings. Eventuele problemen worden eerst informeel besproken en opgelost. VISI wordt enkel gebruikt om dingen formeel vast te leggen. Deze werkwijze is tussen partijen afgesproken.	
Problemen oplossen	
- Er is gekozen om de Raad van Deskundigen (RvD) <u>niet</u> in te schakelen voor geschillenbeslechting, omdat dit een centraal besluit is vanuit de politiek (i.e. het bestuur van het Stadsdeel). Het is een onderdeel van het algemene beleid van het Stadsdeel. Volgens de OG zijn de besluiten van de RvD bijna altijd ten gunste van de aannemer. - Problemen worden langs minnelijke weg opgelost door: elkaar snel te informeren (a.d.h.v. foto's, bellen en mailen), snel afspreken voor overleg en problemen te bespreken tijdens informele overleggen. - Tot nu toe zijn alle problemen langs minnelijke weg opgelost.	
Risicoverdeling	
- Ik was <u>niet</u> betrokken bij het verdelen van de risico's tussen OG en ON. Dit zal Reinoud weten. - Het risicodossier is <u>niet</u> duidelijk m.b.t. de risicodrager, want soms staat er OG/ON. Voor alle risico's moet het duidelijk zijn bij wie het risico ligt. - Er is één risico dat gedeeld wordt qua aansprakelijkheid door OG en ON: het risico van de kwel. - De ON wordt beloond voor het dragen van risico's via een risicoreservering in de inschrijfsom. Dit bedrag was echter heel laag. De beheersmaatregelen van nieuwe risico's worden door de ON afgeprijsd.	
Continu verbeteren van de relatie	
Tijdens het project zijn er <u>geen</u> meetings of workshops geweest en er zijn ook <u>geen</u> maatregelen afgesproken tussen OG en ON ten behoeve van het verbeteren van de relatie.	
Overige systemen of processen	
Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON: burgerparticipatie als gemeenschappelijke vijand voor OG en ON.	

3. Antwoorden op de interviewvragen over 'wijzigingen'	
Projectdoelen	
- De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn enkel afgestemd betreft de procedures, niet betreft het resultaat. Tijdens het project worden eerst informeel afspraken gemaakt over de mogelijke wijziging, vervolgens wordt een VTW opgesteld en in VISI gezet. - De doelstellingen van OG en ON m.b.t. risico management zijn enkel afgestemd betreft de procedures, niet betreft het resultaat. Het risicodossier moet up-to-date gehouden worden door de ON.	

Risico management	
- De ON houdt zich aan de opgestelde risico management plannen tijdens het project. Ik weet <u>niet</u> welke risico management werkzaamheden Reinoud uitvoert voor de OG. - Het gemeenschappelijke risicodossier wordt door de ON bijgehouden. - De aanpak van risico's door de ON is half reactief/half proactief. De ON heeft vaak hulp nodig van de OG (Reinoud en Peter) bij de aanpak.	
Wijzigingsprocedure	
- De gebruikte VTW-procedure wijkt waarschijnlijk af van de wijzigingsprocedure uit het UAV-GC 2005 (par. 14, 15 en 45) vanwege administratieve redenen. Reinoud zal de precieze reden weten. Deze afwijking komt vaker voor in projecten. De wijzigingsprocedure uit het UAV-GC 2005 is te omslachtig en te belastend. Het voordeel van het UAV-GC 2005 is wel dat wijzigingen zonder financiële consequenties ook worden vastgelegd. - Alle sub clausules van par. 14, 15 en 45 uit het UAV-GC 2005 worden <u>niet</u> gebruikt tijdens het project. - De OG en de ON houden zich aan de opgestelde VTW-procedure tijdens het project. - De aanpak van wijzigingen door de ON is grotendeels proactief, want met de meeste VTW's valt geld te verdienen. - De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:	
9. Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	-
10. Het wijzigingsvoorstel opnemen in een logboek	X
11. De prioriteit van de wijziging bepalen	X
12. Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	X
13. De impacts van de verschillende wijzigingsopties bepalen	X
14. (Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15. Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16. Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	-
5. De uitvoering van de wijziging monitoren en documenteren.	1/2
Opmerkingen: Bij 9, 80% van de VTW's wordt pas achteraf opgesteld nadat wijziging al is uitgevoerd omdat de meeste wijzigingen klein zijn. Ze worden wel eerst gemeld, maar er is geen tijd om het werk stil te leggen om eerst het administratieve werk te doen. Redelijkheid en billijkheid en vertrouwen spelen hierin een grote rol. Bij 5, bij kleine wijzigingen is monitoren niet mogelijk doordat de uitvoering van de wijziging voorafgaat aan de VTW. Grote wijzigingen voor dit project zijn wijzigingen vanaf 10.000 euro.	
Continu verbeteren	
- Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Leren van wijzigingen en het delen van de kennis hiervan gebeurt op een informele wijze. - De performance van de risico management processen worden tijdens het project <u>niet</u> gemeten en bijgestuurd.	
Overige systemen of processen	
Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingenproces.	

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)	
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):	
C	1. Betrouwbaarheid: cultuur, beleid
C	2. Samen problemen oplossen
C	3. Gedeelde projectdoelen
C	4. Redelijk gedrag
C	5. Veel communicatie en interacties
C	6. Problemen oplossen op het eerste niveau
C	7. Emotionele investeringen
C	8. Eerlijke/proportionele risicoverdeling
C	9. Duidelijk communicatiesysteem
	10. Systeem voor continu verbeteren van de relatie
	11. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
	12. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):	
C	1. Vroegtijdige waarschuwingsplicht
C	2. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
C	3. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
C	4. Eerlijke/proportionele risicoverdeling
C	5. Risico management systeem
	6. Leren van wijzigingen en kennis hiervan delen
C	7. Adequate documentatie van de wijziging
	8. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
Invloed vertrouwen op wijzigingenproces	
- De efficiëntie van het wijzigingenproces wordt voor <u>75%</u> bepaald door het vertrouwensniveau tussen OG en ON. Veel vertrouwen is gunstig voor de planning van het project. Als er veel vertrouwen in de ON is, weet de OG dat de ON focus heeft op het doel en kan bijvoorbeeld een VTW zelfs pas gemeld worden nadat de wijziging is uitgevoerd. - De effectiviteit van het wijzigingenproces wordt voor <u>0%</u> bepaald door het vertrouwensniveau tussen OG en ON. Onafhankelijk van vertrouwen moeten de partijen aan de eisen voldoen om de wijziging door te voeren.	

INTERVIEW VERSLAG #3P

Interview:	Project Bijlmerweide t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	30-09-2014
Tijd:	09.00 – 11.00u
Locatie:	Kantoor RHDHV Amsterdam
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	24-11-2014
Gevalideerd (DD/MM/JJJJ):	05-12-2014

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
RH	Reinoud Hanlo	Projectleider	RHDHV	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
- De aanbestedingsmethode 'meervoudig onderhands' kon gekozen worden omdat uit een raming bleek dat de opdrachtsom onder een bepaalde drempel bleef. Deze methode heeft de voorkeur van de OG, want dan mag de OG zelf een aantal opdrachtnemers uitnodigen. - Ik was <u>niet</u> direct betrokken bij het selecteren van de opdrachtnemers. Dit deel van de aanbesteding vond intern plaats bij de OG. De factoren die van belang waren bij het selecteren van de opdrachtnemers: weinig risico lopen door opdrachtnemers te kiezen waarmee eerder goed is samengewerkt (o.a. belangrijk vanwege ecologisch gebied) en weinig tijd om een goede opdrachtnemer te kiezen. - De geselecteerde opdrachtnemers waren echter geen 'groen' opdrachtnemers. De kans bestond dus dat de opdrachtnemer het werk zou uitbesteden aan een specialistische onderaannemer. Dit is ook gebeurd in dit project. - De uitsluitingsgronden zijn niet concreet uitgeschreven. Dit omdat de OG zelf de opdrachtnemers had geselecteerd. - De verplichting tot het contract en het Plan van Aanpak (PvA) ten aanzien van meerwaarde waren voldoende om te bepalen hoe betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) de opdrachtnemers waren om het werk uit te voeren. Vooral de competenties van de opdrachtnemers en de inzet van specialistische onderaannemers bleken hieruit. - Op persoonlijk niveau zijn er tijdens de aanbesteding <u>geen</u> aanvullende eisen gesteld aan de werknemers van de ON naast de reeds vigerende eisen/ voorwaarden conform de ISO9001 certificering. Het zou wel beter zijn geweest. Echter, in dit project was het tenderteam (opstellers van het PvA) hetzelfde als het uitvoeringsteam omdat het onderaannemersbedrijf relatief klein is.	
Redelijk gedrag	
Redelijkheid en billijkheid heeft heel veel invloed op het gedrag van de partijen, omdat je bij dit soort kleine projecten niet alleen kan vasthouden aan de theoretische kaders van het UAV-GC 2005. Efficiëntie is essentieel in dit project vanwege de doorlooptijd en de locatie. Vaak worden bijvoorbeeld wijzigingen uitgevoerd na een akkoord van de OG, maar voorafgaand aan een VTW. Redelijk en billijkheid van beide partijen is dan belangrijk. De ON moet niet ineens veel hogere kosten claimen en de OG moet zich aan de afspraak houden en de VTW uitbetalen.	
Projectdoelen	
- Er zijn <u>geen</u> concrete samenwerkingsafspraken vastgelegd tijdens de PSU. Ik had wel een lijstje met punten die belangrijk waren voor de OG m.b.t. de samenwerking, maar het was niet nodig geweest om deze punten aan te stippen omdat de ON tijdens het bespreken van zijn eigen agendapunten de OG reeds had gerustgesteld ten aanzien van het te hanteren kwaliteitsmanagementsysteem. Hierdoor was er tijdens deze meeting gelijk al veel vertrouwen ontstaan in de ON. - Voor de ON is dit project echt een prestige project. Daarom gaan ze er 100% voor. Dit heeft invloed op het vertrouwen in de ON. - Tot nu toe worden de afspraken die tijdens de PSU zijn gemaakt m.b.t. het projectresultaat nagekomen door de ON, want de ON voldoet aan de eisen in het contract.	
Communicatie	
- De partijen houden zich aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Het documentensysteem VISI is opgezet en werkt goed, de bouwvergaderingen zijn ingepland en de voortgangsrapportages worden maandelijks aangeleverd. - Er is evenveel formeel als informeel contact tussen OG en ON. Veel informeel contact is belangrijk in dit soort kleine projecten omdat er vaak snel gehandeld moet worden vanwege de doorlooptijd en de vele stakeholders in het binnenstedelijke gebied.	
Problemen oplossen	
- Er is gekozen om de Raad van Deskundigen (RvD) niet in te schakelen voor geschillenbeslechting, omdat dit een inkooprichtlijn is van het Stadsdeel. Bij het opstellen van het contract is deze richtlijn aangehouden. - Over het algemeen kan een ON hier commentaar op leveren, omdat deze liever wel een RvD inschakelt. Een RvD heeft immers meer kennis over de bouw dan een rechter. In dit project was de ON niet betrokken bij het opstellen van het contract en de ON had ook geen commentaar erop tijdens de Nota van Inlichtingen. - Problemen worden langs minnelijke weg opgelost door: het toepassen van risico management, elkaar vroegtijdig te informeren, samen problemen op te lossen en escalatie van problemen. - Het oplossen van problemen op het eerste niveau gebeurt door Reinoud (PL) en Peter (CM) samen met de ON. Opgeloste problemen waarbij veel veranderd moet worden, kunnen geëscaleerd worden naar Martin (PM). De lijnen tussen deze twee niveaus zijn echter niet zo formeel (i.e. de PM wordt goed op de hoogte gehouden van de problemen op het eerste niveau). - Tot nu toe zijn alle problemen langs minnelijke weg opgelost. Enkele problemen (e.g. het kwel probleem) zijn wel geëscaleerd naar Martin.	
Risicoverdeling	
- Door middel van een risicosessie werd er bepaald welke risico's bij de ON gelegd konden worden en welke risico's de OG zelf kon houden. Er is rekening gehouden met of de ON het risico kon dragen. - De risicoverdeling tussen de OG en de ON bepaalt de contractkeuze.	

- Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. Er zijn wel risico's waarvoor zowel OG als ON verantwoordelijk voor zijn, maar ieder voor een bepaald deel van het risico. - De ON wordt beloofd voor het dragen van risico's via een risicoreservering in de inschrijfsom.
Continu verbeteren van de relatie
Tijdens het project zijn er <u>geen</u> meetings of workshops geweest en er zijn ook <u>geen</u> maatregelen afgesproken tussen OG en ON ten behoeve van het verbeteren van de relatie. Dit is niet nodig geweest, want de relatie is goed. Als er toch problemen zijn, dan wordt dit informeel besproken.
Overige systemen of processen
- Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON. - Aanvulling op 'gedeelde projectdoelen': elkaars belangen (publieke verantwoording OG en winst ON) begrijpen.

3. Antwoorden op de interviewvragen over 'wijzigingen'

Projectdoelen

- De doelstellingen van OG en ON m.b.t. VTW's zijn enkel afgestemd betreft de procedures, niet betreft het resultaat. De opkomst van VTW's is afhankelijk van of er gaten er in het contract zitten en of er scopewijzigingen volgen vanuit OG. De OG kan dus alleen het aantal VTW's minimaliseren door een goed contract op te stellen, te sturen op basis van ISO normen en een duidelijk vastgestelde scope te hebben.
- Tijdens het project is de VTW-procedure iets aangepast. Oorspronkelijk zou de ON een VTW in VISI zetten, waarna de OG hierop kon reageren. Dit werkte niet goed, omdat het te statisch was. Nu worden er eerst via de mail en telefoon afspraken gemaakt over de mogelijke wijziging, vervolgens wordt een VTW opgesteld en in VISI gezet.
- De doelstellingen van OG en ON m.b.t. risico management zijn enkel afgestemd betreft de procedures, niet betreft het resultaat. OG en ON zijn zelf verantwoordelijk voor het beheren van hun eigen risico's.
- De risico's van de OG m.b.t. het proces en de risico's van de ON m.b.t. de uitvoering hebben wel raakvlakken met elkaar. Daarom worden deze weleens naast elkaar gelegd en besproken. De top 10 risico's van de ON wordt opgenomen in de voortgangsrapportages.

Risico management

- De partijen houden zich aan de opgestelde risico management plannen tijdens het project. Over het algemeen werken deze goed, alleen aan het begin van het project moest de format van beide risicoregisters afgestemd worden met elkaar.
- De aanpak van risico's door de OG en ON is grotendeels proactief. Het 'kwel' probleem werd bijvoorbeeld aangekaart door de OG, vervolgens had de ON direct een derde partij ingehuurd om het probleem te onderzoeken. De aanpak zou geheel proactief zijn geweest als de ON zelf het probleem had geconstateerd.

Wijzigingsprocedure

- De gebruikte VTW-procedure wijkt af van de wijzigingsprocedure uit het UAV-GC 2005 (par. 14, 15 en 45) vanwege de omvang en de korte doorlooptijd van het project. De wijzigingsprocedure uit het UAV-GC 2005 is te omslachtig voor dit soort kleine projecten. Om de vaart erin te houden is het belangrijk om VTW's snel te bespreken, daarom is het essentieel dat de kosten al gelijk bekend zijn. Bovendien gaat het vaak om relatief kleine (scope)wijzigingen vanuit de OG.
- Alle sub clausules van par. 14, 15 en 45 uit het UAV-GC 2005 zijn van toepassing, maar ze worden over het algemeen niet gebruikt tijdens het project omdat de partijen een andere VTW-procedure toepassen. De partijen kunnen wel altijd terugvallen op deze clausules. De clausules zijn niet geschrapt omdat het geen risico (e.g. juridisch conflict met de ON) met zich meebracht om ze te laten staan.
- De OG en de ON houden zich aan de opgestelde VTW-procedure tijdens het project.
- De opgestelde VTW-procedure is net zo effectief, maar efficiënter dan die uit het UAV-GC 2005.
- De aanpak van wijzigingen door de OG en ON is grotendeels proactief. De mogelijke wijziging wordt altijd eerst informeel gemeld door de ON, daarna wordt pas een VTW opgemaakt in VISI. Sommige wijzigingen waren niet goed aangepakt door de ON, vooral aan het begin van het project ging er nog weleens iets mis. Daarnaast is de impact van de VTW niet altijd correct.
- De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:

9.	Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10.	Het wijzigingsvoorstel opnemen in een logboek	X
11.	De prioriteit van de wijziging bepalen	X
12.	Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	1/2
13.	De impacts van de verschillende wijzigingsopties bepalen	X
14.	(Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15.	Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16.	Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	-
5.	De uitvoering van de wijziging monitoren en documenteren.	X

- Opmerkingen:
Bij 11, prioriteit wordt onbewust bepaald.
Bij 12, de OG en de stakeholders zijn er niet altijd bij betrokken. De OG vaak alleen vanwege de financiële consequenties betrokken.
Bij 14, besluitvorming is essentieel omdat de ON dit moet verifiëren.
Bij 5, de ON moet de eis verifiëren.

Continu verbeteren

- Tijdens het project worden er geen 'lessons learned' gecreëerd voor wijzigingen. Als er een VTW binnen komt bij de OG wordt er wel even gekeken en besproken waar deze wijziging vandaan komt, maar tot nu toe zijn er geen grote wijzigingen geweest. De wijzigingsprocedure wordt tijdens het project wel verbeterd als het nodig is (bijvoorbeeld het gebruik van VISI).
- De performance van de risicomangement processen van de OG worden tijdens het project gemeten en door middel van de systeem audits. Indien nodig, kan de OG naar aanleiding van de audit een tekortkoming opleggen aan de ON. Vervolgens is het aan de ON om te bepalen hoe hij hiermee omgaat.

Overige systemen of processen

- Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingenproces: kwaliteitsmanagement systeem (ISO 9001) en issue management.

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)

Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):

C	1. Gedeelde projectdoelen
	2. Eerlijke/proportionele risicoverdeling
	3. Samen problemen oplossen
	4. Redelijk gedrag
C	5. Duidelijk communicatiesysteem
C	6. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
C	7. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
	8. Veel communicatie en interacties
	9. Betrouwbaarheid: cultuur, beleid
	10. Emotionele investeringen
	11. Systeem voor continu verbeteren van de relatie
	12. Problemen oplossen op het eerste niveau

Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):

C	1. Kwaliteitsmanagement ISO 9001
C	2. Risico management systeem
	3. Eerlijke/proportionele risicoverdeling
	4. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
C	5. Vroegtijdige waarschuwingsplicht
	6. Issue management
C	7. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
C	8. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
	9. Leren van wijzigingen en kennis hiervan delen
C	10. Adequate documentatie van de wijziging

Invloed vertrouwen op wijzigingenproces

- De efficiëntie van het wijzigingenproces wordt voor 80% bepaald door het vertrouwensniveau tussen OG en ON. Als er geen of weinig vertrouwen is, moeten er meer middelen (tijd, geld etc.) worden ingezet voor controle van een wijziging en impact.
- De effectiviteit van het wijzigingenproces wordt voor 0% bepaald door het vertrouwensniveau tussen OG en ON. Een wijziging wordt doorgevoerd volgens de wijzigingsprocedure, hier is geen vertrouwen voor nodig.

INTERVIEW VERSLAG #4C

Interview:	Project Bijlmerweide t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	02-10-2014
Tijd:	09.30 – 11.30u
Locatie:	Directieketen nabij Kinderboerderij Bijlmerweide
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	24-11-2014
Gevalideerd (DD/MM/JJJJ):	08-12-2014 (automatisch)

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
ES	Erwin Stuart	Projectleider	KWS	-
WH	Wilbert Hogeweij	Projectleider	Hofmeijer	-
CH	Chiel Hofmeijer	Ontwerpleider	Hofmeijer	-
Opmerking: Erwin was aanwezig tot 10.50u.				

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
- De aanbestedingsmethode was 'meervoudig onderhands', waarbij de OG zelf kon kiezen welke aannemers hij wilde uitnodigen. De OG zal dan aannemers kiezen waarvan hij weet dat ze het werk kunnen uitvoeren, betrouwbaar zijn en kwalitatief goed werk afleveren. Daarom was het bij de aanbesteding <u>niet</u> nodig om referentieprojecten te laten zien. - Het Plan van Aanpak (PvA) was voldoende om aan te tonen hoe betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) de ON was om het werk uit te voeren. Er was veel ruimte voor eigen ideeën, waardoor we ons konden onderscheiden van de andere aannemers. We hadden destijds rondgelopen in het gebied en met de enkele bewoners gepraat. Hieruit bleek hoe betrokken de bewoners zijn, dit aandachtspunt hadden we daarom meegenomen in ons PvA. De omgeving was ook belangrijk voor de OG, daarom hadden we hier hoog op gescoord. - Op persoonlijk niveau zijn er tijdens de aanbesteding <u>geen</u> eisen gesteld aan de werknemers van de ON. Daarom was dit aspect <u>niet</u> opgenomen in ons PvA.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW heeft <u>geen</u> invloed op het gedrag van de partijen. Vertrouwen en respect naar elkaar zijn algemene principes van de mensen in dit project zelf en deze hebben zeker invloed op het gedrag van de partijen. Flexibiliteit (i.e. geen stugge houding) van beide partijen is essentieel voor het oplossen van problemen en om uiteindelijk het project goed op te leveren. - Redelijk en billijk gedrag van de ON in dit project is ook belangrijk vanwege mogelijk toekomstig werk. Een goede samenwerking vergroot de kans om geselecteerd te worden voor toekomstig werk bij dezelfde OG.	
Projectdoelen	
- Er zijn <u>geen</u> concrete samenwerkingsafspraken vastgelegd tijdens de PSU. De OG heeft van tevoren (i.e. niet opgenomen als agendapunt) en tijdens het overleg <u>niet</u> aangegeven dit te willen doen. - Tot nu toe worden de afspraken die tijdens de PSU zijn gemaakt m.b.t. het projectresultaat nagekomen door de ON. Sommige bewust, andere onbewust.	
Communicatie	
- De partijen houden zich aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Het gebruik van VISI (=DMS) is echter aangepast en efficiënter gemaakt. Een VTW wordt pas ingevoerd als er een akkoord is. - Er is veel informeel contact tussen OG en ON via de telefoon en de mail. Daarnaast is Adel als opzichter regelmatig op de bouwplaats aanwezig. Echter, volgens het UAV-GC 2005 hoort zijn rol op de bouwplaats minimaler te zijn. De voortgang van het project wordt door Peter vooral op papier gevolgd.	
Problemen oplossen	
- Er is waarschijnlijk gekozen om de Raad van Deskundigen (RvD) <u>niet</u> in te schakelen voor geschillenbeslechting, omdat de OG door de meervoudig onderhandse aanbesteding te maken heeft met een bekende aannemer. De ON had <u>geen</u> invloed op deze keuze. - Problemen worden langs minnelijke weg opgelost door: goed en tijdig overleg, openstaan voor elkaars argumenten en samen problemen oplossen (e.g. het kwel probleem). - Tot nu toe zijn alle problemen langs minnelijke weg opgelost.	
Risicoverdeling	
- De ON was <u>niet</u> betrokken bij het verdelen van de risico's die bij de aanbesteding bekend waren. Dit risicodossier van de OG heeft de ON na de aanbesteding <u>noot</u> meer teruggezien. - De ON heeft zelf een risicodossier opgesteld voor algemene risico's en ook de risicodragers hiervoor bepaald. Dit dossier was doorgestuurd naar de OG en er was <u>geen</u> commentaar op. De ON gaat er dus vanuit dat de OG akkoord is met de risicoverdeling. - De ON geeft regelmatig een top 10 risico's door aan de OG, deze worden dan besproken. - De risicodossiers van de ON en OG worden <u>niet</u> met elkaar vergeleken. - Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. Er zijn wel risico's waarvoor zowel OG als ON verantwoordelijk voor zijn, maar ieder voor een bepaald deel van het risico. Voor een bepaald risico kan de OG bijvoorbeeld verantwoordelijk zijn voor het financiële deel, terwijl de ON verantwoordelijk is voor de uitvoering. - De ON wordt beloofd voor het dragen van het risico via een risicoservering in de inschrijfsom. Als beheersmaatregelen tot een wijziging leiden, dan wordt de ON betaald voor de VTW.	
Continu verbeteren van de relatie	

Tijdens het project zijn er <u>geen</u> meetings of workshops geweest en er zijn ook <u>geen</u> maatregelen afgesproken tussen OG en ON ten behoeve van het verbeteren van de relatie. Het verbeteren van de relatie met de OG is een continu proces via formeel en informeel contact. Een goed product neerzetten helpt hierbij.
Overige systemen of processen
Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON: de omgang met de bewoners en stakeholders.

3. Antwoorden op de interviewvragen over 'wijzigingen'	
Projectdoelen	
- De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn enkel afgestemd betreft de procedures, niet betreft het resultaat. VTW's zijn contractwijzigingen die de partijen bespreekbaar maken met elkaar, zowel als het om meer- als minderwerk gaat. Het aankaarten van minderwerk helpt de ON om vertrouwen te winnen van de OG. - De doelstellingen van OG en ON m.b.t. risico management zijn enkel afgestemd betreft de procedures, niet betreft het resultaat. Er staan <u>geen</u> afspraken op papier. De OG heeft alleen tips gegeven voor verbetering en een akkoord gegeven voor het risicodossier.	
Risico management	
- De partijen houden zich aan de opgestelde risico management plannen tijdens het project. Over het algemeen werken deze goed. Beheersmaatregelen worden uitgevoerd en het risicodossier wordt actueel gehouden. - De aanpak van risico's door de OG en ON is half reactief/half proactief. De aanpak van risico's die bij de aanbesteding bekend waren, gaat goed. Voor sommige kleine risico's zijn de beheersmaatregelen onvoldoende.	
Wijzigingsprocedure	
- De gebruikte VTW-procedure wijkt af van de wijzigingsprocedure uit het UAV-GC 2005 (par. 14, 15 en 45) omdat de wijzigingsprocedure uit het UAV-GC 2005 te omslachtig is voor dit kleine project. De wijzigingen in dit project zijn meestal klein. Het direct aangeven van de impact van de wijziging komt vanuit de RAW-systematiek voor meerwerk. Hierbij is het belangrijk dat er eerst een akkoord is over de impact voordat het meerwerk wordt uitgevoerd. 9/10 Keer wordt een wijziging informeel gemeld bij de OG. Vervolgens wordt dit schriftelijk vastgelegd en 9/10 keer worden de consequenties hierbij aangegeven. - Alle sub clausules van par. 14, 15 en 45 uit het UAV-GC 2005 worden <u>niet</u> gebruikt tijdens het project. Als er een potentiële wijziging is, wordt er door de ON gekeken wie er verantwoordelijk is voor de kosten volgens het contract. - Een goede verstandhouding met de OG helpt in de wijzigingsprocedure. De OG geeft dan namelijk makkelijker een akkoord voor een VTW. - De OG en de ON houden zich aan de opgestelde VTW-procedure tijdens het project. - De aanpak van wijzigingen door de ON is grotendeels proactief. Tijdens de aanbesteding bijvoorbeeld voorzag de ON een probleem met het te verwijderen asfalt bij de bruggen en had hier vragen over gesteld. De OG had hier echter niks mee gedaan, dus de ON had dit niet opgenomen in zijn inschrijfsom. Het probleem kwam echter tijdens het project weer naar boven. Bovendien worden VTW's gemeld en besproken tijdens de bouwvergaderingen. - De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:	
9. Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10. Het wijzigingsvoorstel opnemen in een logboek	X
11. De prioriteit van de wijziging bepalen	-
12. Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	1/2
13. De impacts van de verschillende wijzigingsopties bepalen	-
14. (Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15. Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16. Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	X
5. De uitvoering van de wijziging monitoren en documenteren.	X
Opmerkingen: Bij 12, de ON komt met een voorstel en als het nodig is worden alternatieven besproken met de OG. Bij 13, dit wordt bij de vorige stap al gedaan. Meestal wordt de impact van één optie berekend. Bij 14, de snelheid van de besluitvorming hangt af van de prioriteit en grootte van de VTW, of er apart VTW overleg is en of de OG de VTW moet escaleren. Aan het begin waren er onduidelijkheden over de acceptatiemethode in VISI en over de acceptatiebevoegdheid bij de OG, daarom wordt er nu buiten VISI om een beoordeling gegeven. Dit gaat goed. Bij 16, documentatie gebeurt in de vorm van de VTW's. Bij 5, het monitoren hangt af van de wijziging. Documentatie gebeurt in de vorm van verificatie van een eis.	
Continu verbeteren	
- Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Leren van wijzigingen gebeurt onbewust en wordt <u>niet</u> gerapporteerd. - De performance van de risico management processen worden tijdens het project <u>niet</u> gemeten en bijgestuurd. Dit gebeurt onbewust.	
Overige systemen of processen	
Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingsproces: vertrouwen tussen OG en ON.	

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)			
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):			
	Wilbert		Chiel
C	1. Veel communicatie en interacties	C	1. Redelijk gedrag
	2. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)		2. Veel communicatie en interacties
	3. Samen problemen oplossen		3. Samen problemen oplossen
	4. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)	C	4. Problemen oplossen op het eerste niveau
	5. Eerlijke/proportionele risicoverdeling		5. Gedeelde projectdoelen
	6. Betrouwbaarheid: cultuur, beleid		6. Duidelijk communicatiesysteem
	7. Gedeelde projectdoelen		7. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
	8. Problemen oplossen op het eerste niveau		8. Betrouwbaarheid: cultuur, beleid
	9. Redelijk gedrag		9. Eerlijke/proportionele risicoverdeling
C	10. Emotionele investeringen		10. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
C	11. Systeem voor continu verbeteren van de relatie		11. Emotionele investeringen
C	12. Duidelijk communicatiesysteem		12. Systeem voor continu verbeteren van de relatie
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingsproces (C = in contract opnemen):			
	Wilbert		Chiel
C	1. Vroegtijdige waarschuwingsplicht	C	1. Adequate documentatie van de wijziging
	2. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin		2. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
	3. Vertrouwen tussen OG en ON	C	3. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
C	4. Eerlijke/proportionele risicoverdeling	C	4. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
	5. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren		5. Vroegtijdige waarschuwingsplicht
C	6. Adequate documentatie van de wijziging	C	6. Risico management systeem
	7. Gedeelde projectdoelen voor wijzigingenbeheer en risico management		7. Eerlijke/proportionele risicoverdeling
	8. Leren van wijzigingen en kennis hiervan delen		8. Vertrouwen tussen OG en ON
C	9. Risico management systeem		9. Leren van wijzigingen en kennis hiervan delen
Invloed vertrouwen op wijzigingsproces			
- De efficiëntie van het wijzigingsproces wordt voor <u>50%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er veel vertrouwen is, zal het proces sneller zijn omdat de OG dan sneller gelooft dat de ON niet zomaar met iets komt aanzetten. Met andere woorden, de OG hoeft minder tijd te nemen om iets te checken. - De effectiviteit van het wijzigingsproces wordt voor <u>20%</u> bepaald door het vertrouwensniveau tussen OG en ON. De OG moet vertrouwen hebben in de kennis van de ON dat hij weet wat ie doet en met een goed wijzigingsvoorstel komt.			

25. Bijlmerweide: Assessment data

25.1 The Dutch culture

Power Distance Index (PDI) score 38 (L)

In small power distance cultures, all should have equal rights, parties will always negotiate, parties treat all business partners and potential business partners equally, decisions to deceive, trust, and forgive are not influenced by the other party's status, and trust is equally important in every relationship, regardless of the other party's status (Hofstede et al., 2010, pp. 72, 76, 83; Verwaart, 2011, pp. 19, 114, 118).

Individualism versus Collectivism (IDV) score 80 (VH)

In individualistic cultures, parties feel free to do business with any party, negotiate prior to the formation of a relationship, only pursue their own personal interests, depend on their personal judgment and will be more careful to trust, and show distrust as it is. The thresholds for opportunistic behaviour, trust and forgiveness are based on personal relations and the personal interests in these relations (Hofstede et al., 2010, pp. 113, 124, 130; Verwaart, 2011, pp. 19, 104-108).

Masculinity versus Femininity (MAS) score 14 (VL)

In feminine/co-operation oriented cultures, building relationships is important, focus is on good intentions rather than on performance, trust implies intrinsic trust (i.e. trust that accepts vulnerability), implicit trust is high and cheaters are looked down upon (Hofstede et al., 2010, pp. 155, 170, 180; Verwaart, 2011, pp. 18, 90-91).

Uncertainty Avoidance Index (UAI) score 53 (M)

In uncertainty avoiding cultures, parties express their emotions and aggression, only take known risks, need rules to trust, are hesitant to do business with new partners and do not trust them, and have a low deceit threshold towards strangers. Whereas in uncertainty tolerant cultures, parties suppress their emotions and aggression, are willing to take unknown risks, do not need rules to trust, are not hesitant to do business with new partners and do not particularly distrust them, and may be tempted to do deceit in order to make extra profit (Hofstede et al., 2010, pp. 203, 208, 217, 223; Verwaart, 2011, pp. 20, 132-135).

Long-Term Orientation versus Short-Term Normative Orientation (LTO) score 67 (H)

In long-term oriented cultures, parties will not put a relationship with a business partner at stake by deceiving, value their relationships, focus on building a strong market position, and avoid the risk of damaging their relationships (Hofstede et al., 2010, pp. 203, 208, 217, 223; Verwaart, 2011, pp. 20, 132-135).

Indulgence versus Restraint (IND) score 68 (H)

In indulgent cultures, parties have a perception of personal life control, have less moral discipline, and have a positive attitude (Hofstede et al., 2010, pp. 291, 297).

25.2 Assessment of trust in the project

Table 99: Assessment model for trust on project Bijlmerweide

Objective	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)	
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	2.5
			(2) Seek party with similar culture/policy	3	2.5
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2.5
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	3
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	2.5
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	2
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	1
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	3
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	3
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	3.5
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	1
TOTAL LEVEL OF TRUST RELATIONSHIP			2.91	2.41	

(1+2) Trustworthiness (ability, integrity and predictability)

Main findings:

- A. According to the Selection and Tender Guideline (Gemeente Amsterdam Stadsdeel Zuidoost, 2014c, p. 2), the contract was put out to National tender and the Employer chose the direct agreement procedure conforming the Public Works Procurement Regulations 2012 (ARW 2012), which implies that he has to select 3 to 5 contractors of his own choice for the procurement.

- Conforming to interviewee #3P, this procedure was allowed because the contract value did not exceed the €1,500,000.
- 1/4 interviewees (#1E) was directly involved in the selection process which was held internally in the Employer's organization and another interviewee (#3P) was indirectly involved. The factors which determined the selection were good past co-operation, experience in ecological works and little time for the selection. #3P mentions that none of the selected contractors was a specialist in ecological works, so it was likely that the winning contractor subcontracts the works to a specialist, which actually happened on this project.
- B. Pursuant to the Selection and Tender Guideline (Gemeente Amsterdam Stadsdeel Zuidoost, 2014c, pp. 7-14, annex 16), the Employer applied some facultative grounds for refusal, like bribery, money laundering, bankruptcy and tax debt, but did not have any requirements in terms of finances or technology. The Most Economically Advantageous Tender was determined on the basis of qualitative and financial award criteria. The qualitative part consisted of the contractor's proposal which was assessed on the programme, working in a fragile ecological area, the works during the maintenance period, and the elaboration of the soil retaining water bank protection and kingfisher wall. The financial part encompassed the tender prices for the design, the construction, the as built files, and the maintenance.
 - 4/4 interviewees were involved in this phase of the procurement process.
 - On the one hand, according to the Employer's team the grounds for refusal and the contractors' proposals were sufficient to determine the contractors' trustworthiness (ability, benevolence, integrity, predictability and reliability) to carry out the project. The quality of the proposals clearly showed the differences in technical competences between the Contractors regarding land development and ecological works and whether they hired or consulted specialists. In addition, interviewee #1E mentions that the discount formula was essential to ensure a good price-quality ratio and to force the contractors to deliver a high quality besides a low price.
 - On the other hand, according to the Contractor's team, the contractors could show by means of their proposal how trustworthy they were to carry out the project. The Employer allowed a lot of room for the contractors to come up with their own ideas (e.g. regarding stakeholder management) in order to distinguish themselves.
 - Interviewees #1E and #4C further state that the contractors' trustworthiness was checked first during the selection process.
- C. Pursuant to the ER (Gemeente Amsterdam Stadsdeel Zuidoost, 2014b, pp. 55-56), the Employer also had requirements on the personal level with respect to the contractors' team. The Employer only demanded that certain team members were certified for 'Flora en faunawet bestendig beheer'.
 - Only 1/4 interviewees (#1E) mentions this requirement, whereas the other interviewees state that there were no requirements on the personal level.
 - 2/4 interviewees (#3P and #4C) state that in this project, the Contractor's tender team is the same as the project implementation team, which was probably because the Contractor hired a relatively small Subcontractor.

(8) Trustworthiness (integrity and benevolence)

Main findings:

- A. The Dutch Civil Code (DCC) is complementary to the UAC-IC 2005 and requires the parties to act in good faith (i.e. reasonableness and fairness).
 - 4/4 interviewees acknowledge the importance of the principle of good faith and that it has quite some influence on the behaviours of the Employer and the Contractor during the project. However, the people involved in the project do not act in that manner because it is written down in the DCC, it rather seems to be a general principle of them. #1E argues that the contract always has 'grey' areas as you cannot include everything in the contract. These 'grey' areas are subject of discussion between the parties.
 - 3/4 interviewees (#1E, #3P and #4C) mention that good faith allows for flexibility in the parties' attitude and behaviour to resolve problems (mainly regarding variations and safety) quickly and deliver the project in time, which is important because of the short programme and the location. For example, #3P mentions that often it is necessary to deviate from the formal procedures to implement variations prior to the paperwork. In such cases, the Employer gives his approval for the variation, the Contractor implements it and thereafter both parties have to trust each other that the correct paperwork will follow (e.g. the Employer will pay for the variation and the Contractor will not claim higher costs than agreed upon).
 - #2E argues that there is a lot of mutual trust and openness between the parties, which is created by people involved, because the Employer has another live construction project in the same area in which the contractor is constantly trying to deceive the Employer. #2E and #3P state that the Subcontractor is very passionate about his work as it is a prestigious project for him and is not only interested in making a profit but is also very motivated to deliver a good project, which increases the Employer's trust in the Contractor.
 - #4C states that acting in good faith is also important to increase the likelihood of future co-operations with the Employer.
 - #4C argues that the Contractor may gain trust from the Employer if he is delivering a good product and if he not only indicates additional work, but also reduced work.

(3) Objectives

Main findings:

- A. According to the meeting minutes of March 10th 2014, the Employer intended to discuss collaboration objectives with the Contractor during the Project Start Up (PSU). However, there is nothing on paper that shows the Employer and the Contractor actually made any agreements regarding the relationship (i.e. how people should treat each other).
 - 3/4 interviewees (#2E, #3P, and #4C) were involved in the PSU and indeed state that the parties did not make any collaboration agreements. Conforming to #3P, it was not necessary to point out such matters, because when the Contractor discussed his things, at the same time, he also reassured the Employer regarding the use of the quality management system, which increased the Employer's trust in the Contractor.
- B. The objectives regarding the project results are stated in the Employer's Requirements. Pursuant to the meeting minutes, these were discussed during the PSU and the parties made agreements regarding the quality management system, the stakeholder management and the technology. In addition, the Basic Contract (Art. 16 and annex 2) states that the project has two deadlines and if the Contractor

does not meet them, he will get a fine. These deadlines are strict, because Rijkswaterstaat's highway A9 megaproject cannot start before this project is completed.

- 4/4 interviewees state that the Contractor has met these objectives and agreements up to now. #1E mentions that the audit results regarding the quality management system were positive. #2E mentions that sometimes, the Contractor has difficulties with proving something.
- C. The parties seem to have created a win-win-win situation for themselves. The Employer gets the high quality product and the Contractor receives his cut for managing the project, and the Subcontractor for executing the works.
 - According to #3P, it is a prestigious project for the Subcontractor, therefore he is very motivated to deliver a good project.

(4) Communication (system)

Main findings:

- A. As stated in (Gemeente Amsterdam Stadsdeel Zuidoost, 2014b, pp. 38-43), there are some requirements with respect to the communication and information between the Employer and the Contractor. The Contractor elaborated these requirements in his Project Management Plan (PMP) (KWS & Hofmeijer, 2014, pp. 8, 9, 13). The communication plan includes the meeting schedule, the progress reports and the Document Management System (DMS). In addition, the Contractor uses a standard form for variations.
 - 4/4 interviewees state that the Employer and the Contractor have complied with the communication and information plans stated in the ER and the PMP up to now.
 - #1E and #3P mention that these plans work well, the documents have been delivered in time and were discussed during meetings, the next meetings are scheduled, and the DMS VISI has been set up.
 - #2E and #4C stress that VISI did not work well at the beginning as it was too complex and devious and offered too many choices, but the parties agreed to adjust it and make it more efficient, and to only enter the variation into VISI after approval.

(9) Communication (repeated fulfilment)

Main findings:

- B. The contract documents do not require informal communication between the parties.
 - 4/4 interviewees say that there is a lot of informal communication between the Employer and the Contractor by phone, mail, informal meetings and on site.
 - According to #1E and #3P, informal communication is important to deal with matters quickly, which is necessary because of the short duration of the project and the many residents (stakeholders) involved in the project.
 - #2E states that the parties agreed to discuss and resolve problems informally prior to confirming things in VISI.

(5) Problem solving (philosophy)

Main findings:

- A. In the Basis Contract article 18, the Employer chose not to authorize a Dispute Adjudication Board (DAB) or the Court of Arbitration to settle disputes. Instead, disputes must be referred to the Court in Amsterdam. This choice is in line with what (Bleeker, 2014b, p. 716) states.
 - Only 2/4 interviewees (#2E and #3P) knew why the Employer made this choice. Both mention that the choice was in accordance with the general guidelines of the Employer's organization. According to #2E, the Employer is of the opinion that the arbitrator's decisions are mostly in favour of the Contractor, but #2E does not know why the DAB was not chosen as he was not aware that the DAB and the Court of Arbitration are two different things. #3P states that the choice is not a logical one, because both the DAB and the Court of Arbitration have more knowledge about the construction industry than a judge does.
 - #3P and #4C state that the Contractor was not involved in drawing up the contract and did not have any remarks on this article during the procurement process.
 - #1E mentions that the Legal Department in the organization advised to choose the Court in Amsterdam.
- B. The contract documents do not have requirements regarding problem-solving by amicable agreement.
 - According to the interviewees, the parties do the following to resolve problems amicably: warn each other timely by phone, email, pictures or during meetings, meet as soon as possible thereafter, be open to each other's arguments, collaboration and mutual help (e.g. the problem of seep), and escalation to management.
 - #3P also mentions risk management as a means to foresee problems.

(10) Problem solving (effectiveness)

Main findings:

- C. So far, all problems seem to be resolved by amicable agreement since no disputes were referred to the Court.
 - 4/4 interviewees indeed say that all problems were resolved by amicable agreement.
 - #1E and #2P also state that a few risks (e.g. the risk of seep) were escalated up to the highest level. Problems which require many changes to resolve them will be escalated. The escalation model consists of the people on the work floor> the Project Manager> Rijkswaterstaat. The lines between the first two levels are informal since the Project Manager is quite up to date about any problems.
 - #1E argues that the problem must be really unsolvable together or about a lot of money relatively if the parties refer it to the court, because the dispute resolution process costs a lot of time and money for both parties.

(6) Risk allocation

Main findings:

- A. The Employer's risk register was included as an annex to the contract and is more detailed than the risk clauses in the UAC-IC 2005, but the register is more or less in line with the UAC-IC 2005. The amendment is in line with what (Bleeker, 2014a, p. 611; 2014b, p. 716) states.
 - 2/4 interviewees (#1E and #3P) were involved in the risk session in which the Employer made the risk allocation. In principle, risks were allocated to the Contractor as much as possible, but if the Contractor could not carry a risk or the Employer was best able to manage a risk, the Employer would carry that one himself.
 - According to #4C, the Contractor had to draw up a risk register as well which included the general risks and the risk owners. This risk register had to be sent to the Employer, because the document was part of his test plan. The Contractor did not receive any comments, therefore he assumed the Employer had accepted it.
- B. The Employer's risk register is not clear in terms of who the risk owner. For many risks the risk owner is Employer/Contractor. It is not clear whether this implies that it is not yet decided or that the parties share the risk.
 - According to 4/4 interviewees, the parties do not share any risks in terms of liability, except for one unforeseen risk (i.e. the risk of seep). There are some risks for which the Employer is responsible for one aspect (e.g. the finances), whereas the Contractor is responsible for another aspect (e.g. the construction).
- C. It is not clear whether the Contractor gets rewarded for carrying his risks, because he was not obliged to specify a risk allowance in his tender price.
 - According to 4/4 interviewees, the Contractor's reward for carrying risks is included as a risk allowance in the tender price. However, #2E states that this risk allowance was very low. #1E and #4C mention that additional works and associated risks and variations as a result of risk mitigation measures for the Employer's risks will be priced by the Contractor and paid by means of variation orders.
 - 3/4 interviewees (#1E, #2E and #4C) say that mitigation measures for new risks will be rewarded by means of change orders.

(7) Continuous improvement (system)

Main findings:

- A. There is nothing in the project records regarding a system or measures for the purpose of improving the relationship between the parties during the project.
 - 4/4 interviewees indeed state that the Employer and the Contractor did not agree on a system or measures for the purpose of improving their relationship during the project. Such measures were not needed, because the relationship is good and the parties communicate openly and informally with each other about problems.
 - #1E also mentions that the Employer does have an evaluation meeting with the Contractor planned at the end of the project to discuss potential points for improvements (e.g. the Employer's procedures and soft skills).

(11) Continuous improvement (emotional investments)

Main findings:

- B. There is nothing in the project records regarding formal meetings or workshops for the purpose of improving the relationship between the Employer and the Contractor.
 - 4/4 interviewees confirm that. Such meetings were not needed because the relationship is good. The relationship improves by means of formal and informal contact between the parties and is a continuous process. Any problems will be discussed informally with each other.
 - #4C also states that the relationship improves if the Employer sees that the Contractor is delivering a good product.

(x) Other trust components

- A. Other components which are relevant for building and sustaining trust between the Employer and the Contractor on this project are:
 - #2E and #4C mention the way the Contractor deals with the residents and other stakeholders.
- B. Remarks on existing components:
 - #3P mentions an addition to 'joint goal setting': understand each other's interests (i.e. public accountability for the Employer and making profit for the Contractor)

25.3 Overview of trust building aspects on the project

Table 100: Overview of trust building aspects on project Bijlmerweide

Building trust (score 3-4)	
(1+2) Direct agreement procedure, National tender. The Employer was allowed to select the contractors of his own choice	
(1) The tender team is the same as the project implementation team	
(1) No significant amendments to the UAC-IC 2005	
(3) Focus on the target in terms of the programme mainly due to strict deadlines and fines.	
(3+x) WIN for all parties and understand each other's interests	
(3+8) Informal incentive for the Subcontractor (prestigious project), so not merely wants to make profit	
(3+8) The likelihood of future co-operations	
(3) The Contractor adheres to the quality management system	
(3+8) The Contractor is delivering a good product	
(4) Clear communication system	
(4) Use of a shared Document Management System	
(4) Only a standard form and register for variations	
(5+9) Informal discussion and agreement prior to sending the formal documents	
(6) To a large extent, the risks are allocated to the party best able to manage them	
(8) Reduced work indicated as well	
(8) The Contractor's goodwill, passion and motivation to deliver a good project	
(8) Reasonable and fair behaviour of both parties	
(9) A lot of informal communication by means of phone, email, visits etc.	
(10) Timely joint problem-solving at the lowest levels	
(x) The way the Contractor deals with the stakeholders	
Could be done better to build trust (score 2-2.5)	
(1+2) Pre-selection was not aimed at specialist contractors	
(1) Requirements on the organizational level were merely based on the technical competences	
(1) MEAT award criterion: only based on price and quality	
(1) Requirements on the personal level were merely based on the technical competences	
(3) No other mutual objectives besides fitness for purpose	
(3+8) No collaboration agreements	
(5) Only informal EWs with no sanctions	
(5) Limited co-operation and mutual help to resolve problems	
(6) Ultimate risk allocation is unclear due to the risk registers	
(6) Only a small risk allowance for the Contractor's risks	
(8) Good faith in the DCC has no direct influence	
(10) Disputes cannot be referred to the DAB or arbitration, but only to the court	
Building distrust (score 1-1.5)	
(6) No risk sharing	
(7+11) The relationship improves informally	

BOLD = (Related to) condition of contract, ITALIC = Amendment to contract, GREY = Important aspect

25.4 Assessment of change management in the project

Table 101: Assessment model for change management on project Bijlmerweide

Objective	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)		
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	2	
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	3	
			Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	2
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	2	
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	1.5	
			(6) Update shared databases and incorporate lessons learned for project and organization	4	1	
	Recognize change	Change management process	(7) Early identification of potential changes	4	3	
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	1.5	
			(9) Document the proposed change in a log	3	3	
	Evaluate change		(10) Determine priority of the change	3	2	
			(11) Selection of optimum change options by consulting all relevant parties	3	2.5	
			(12) Identify the likely impacts of different change options	3	2.5	
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	2.5	
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	3	
			(15) Appropriate documentation to record all decisions within the change process	3	2	
	Monitor implementation		(16) Monitor and record implementation	3	1.5	
TOTAL LEVEL OF CHANGE MANAGEMENT			3.19	2.19		

(1) Objectives

Main findings:

- A. There is nothing in the project records with respect to change management objectives.
Conforming to all interviewees, the Employer and the Contractor only aligned the objectives regarding the procedures for change management, but not regarding the results.
 - #1E and #3P state that variations are necessary scope changes in order to achieve the project result and arise if the Contract does not cover the aspect or contains errors, or if the Employer requests them. Therefore, it is not possible to have an objective like 'minimize the number of variations', since this is very dependent on the contract. #1E further argues that reasonableness and fairness is important when the Employer has to accept or reject the variation, because he will check whether the variation was foreseeable for the Contractor at the time of procurement.
- B. There is nothing in the project records with respect to risk management objectives.
 - 3/4 interviewees (#2E, #3P and #4C) are directly involved in the risk management processes and state that the Employer and the Contractor only aligned the objectives regarding the procedures for risk management, but not regarding the results.

(3) Risk allocation

See trust criteria (6).

(4) Risk management

Main findings:

- A. The Employer's Requirements (Gemeente Amsterdam Stadsdeel Zuidoost, 2014b, p. 39+43) includes requirements regarding risk management by the Contractor. The Contractor elaborated these requirements in his PMP (KWS & Hofmeijer, 2014, p. 13). The risk management processes include the setup and use of a risk register, the analysis of risks, the risk measures and the discussion of risks during progress meetings.
 - 3/4 interviewees (#2E, #3P and #4C) are directly involved in the risk management processes and state that so far, the Employer and the Contractor have complied with the risk management plans stated in the ER and the PMP, and that these plans work well.
 - 3/4 interviewees (#1E, #3P and #4C) mention that the Contractor includes his top 10 risks in the progress reports.
 - It seems to be unclear to most interviewees as to which risk management processes the Employer's team conducts and by whom. #3P states that the Employer and the Contractor are responsible for managing their own risks and that the two risk registers are compared sometimes to discuss the interfaces. However, the other interviewees (#1E, #2E and #4C) do not seem to be aware of the existence of the Employer's risk register during the project implementation, so they also do not compare and discuss the interfaces between the two registers together. Further, there seems to be confusion about the roles and responsibilities regarding the management of the Employer's risks.
- B. It is not clear from the project records how proactive the risk management approach of the parties is.
 - According to the interviewees, the risk management approach by the Employer and the Contractor during the project is half reactive/half proactive to largely proactive. The large risks are dealt with quite proactively, whereas the minor risks are dealt with quite reactively (e.g. risk measures are insufficient, less monitoring).

(2) Change management procedure (overall)

Main findings:

- A. §14, §15 and §45 in the UAC-IC 2005 set out the change management procedure, but this one is not used on the project. The PMP (KWS & Hofmeijer, 2014, p. 12) and Notitie Organisationschema SCB (Royal HaskoningDHV, 2014) together lay down the standard change management processes at both sides. Both the Employer and the Contractor have to submit the change order to the Contractor's project leader, this form includes a description, the reason, the consequences and the required actions of the variation. The project leader records the variation request in the change register. The Employer accepts or rejects the change order and the decision will be recorded in the register. The change management procedure used deviates a lot from the one in the UAC-IC 2005.
 - 4/4 interviewees state that the change management procedure in the UAC-IC 2005 is too circuitous and onerous for the size and the short duration of the project. Therefore, the parties decided to apply a more efficient procedure.
 - 3/4 interviewees (#2E, #3P and #4C) state that most variations are relatively small on this project (variations are big if they exceed €10,000) and must be discussed quickly, otherwise the Contractor cannot continue the works. Therefore, it is important to know the impact of the variation immediately in order to make the decision to accept/reject the variation. #4C argues that the latter is also partly derived from the RAW method in which additional work needs to be approved first before it is implemented. The unsuitable change management procedure in the UAC-IC 2005 in such cases is in line with what (Bleeker, 2014b, p. 710) states.
 - 3/4 interviewees (#2E, #3P and #4C) mention that the change management procedure has changed a bit during the project to make it even more efficient. In first instance, the Contractor had to enter all potential variations into VISI so that the Employer could reply to it, but this process was too complex, circuitous and static. Later, as 4/4 interviewees point out, any potential variation will be discussed and agreed informally between the parties by email or phone prior to drawing up the change order and entering it into VISI.
 - #4C also states that it helps to have a shared understanding with the Employer, because then he is more flexible when accepting variations.
 - #2E mentions that it is an advantage of the UAC-IC 2005 that variations without financial consequences are also recorded.
- B. It is not clear from the project records as to whether the parties apply any of the variation clauses in the UAC-IC 2005.
 - 3/4 interviewees (#2E, #3P and #4C) are directly involved in the change management processes and state that they do not apply any of the variation clauses in the UAC-IC 2005, because they use another change management procedure. #3P argues that the clauses were not omitted, because the Employer did not see any risk (e.g. legal dispute with the Contractor) in not omitting them and the change management procedure could always be used as a backup.
- C. The project records do not show whether the parties have adhered to the change management procedure which was agreed upon.

- 3/4 interviewees (#2E, #3P and #4C) are directly involved in the change management processes and state that so far, the Employer and the Contractor have complied with the change management procedure. #3P mentions that at the beginning, some variations were not processed correctly by the Contractor and that the impact on the change order is not always correct.

(7) Change management procedure (early identification)

Main findings:

- D. It is not clear from the project records how proactive the change management approach of the parties is.
- 4/4 interviewees states that the change management approach by the Employer and the Contractor during the project is largely proactive. The Contractor notifies variations informally as soon as possible by phone or email of during progress meetings.

(7-16) Change management procedure (standard processes)

Main findings:

- E. The Employer and the Contractor agreed on standard change management processes, which are stated in the PMP (KWS & Hofmeijer, 2014, p. 12) and Notitie Organisationschema SCB (Royal HaskoningDHV, 2014).
- According to the interviewees, these processes correspond more or less with the ones in the assessment table.
 - Altogether, there were a few remarks on the processes:
 - (8) Most variations (about 80%) are small and are often implemented prior to the paper work. Such variations will be notified first. After acceptance by the Employer, the works will continue and the change order will be drawn up thereafter. This way of working requires good faith and trust.
 - (10) The parties determine the priority unknowingly.
 - (11) In most cases the Contractor has only one proposal and the Employer is mainly involved to discuss the financial impacts.
 - (13) The authority for decision-making by the Employer was not clear at the beginning. The speed of decision-making depends on the priority and the impact of the variation, if there is a separate variations meeting and if the Employer needs to escalate the variation.
 - (15) Documentation by means of the variation orders.
 - (16) Monitoring is not possible if the variation was implemented prior to the paper work and the implementation is recorded by means of verification of the changed requirement.
 - Overall, the change management procedure is not followed as consistent as should be.

(8-9+15-16) Change management procedure (documentation)

Main findings:

- F. According to the PMP (KWS & Hofmeijer, 2014, p. 12), the Employer and the Contractor use a change register and a standard form to record the description, the initiator, the status and the consequences of the variation, and the description, the reason, the consequences and the required actions of the variation, respectively. The variation order will be entered into VISI (=DMS), so that the Employer can reply to it.
- This has been confirmed by all interviewees.
 - #3P and #4C state that the Contractor records the implementation by means of verification of the changed requirement.

(5+6) Continuous improvement (review and share knowledge)

Main findings:

- A. There is nothing in the project records with regard to learning from changes and sharing this knowledge.
- 4/4 interviewees confirm this and state that the Employer and the Contractor learn from changes informally and unknowingly.
 - #1E also states that this aspect may be included in the project evaluation.
 - #3P also states that the parties did improve the change management procedure during the project.
- B. There is nothing in the project records with respect to measuring the risk management performance.
- 3/4 interviewees (#2E, #3P and #4C) are directly involved in the risk management processes, two of them of which (#2E and #4C) state that the risk management performance is not measured. #3P mentions that the Employer checks whether the Contractor follows the risk management procedure by means of system audits, but it is up to the Contractor to adjust things if needed.

(x) Other change management components

- A. Other systems or processes which are relevant for creating an efficient and effective change management process on this project are:
- #3P: The issue management (i.e. the management of an issue after the early warning about it, but prior to the change order).
 - #3P: The quality management system: many variations occur in the quality management processes. If the Contractor cannot verify a requirement as it is stated in the ER, then it is a deviation. If the deviation cannot be corrected, a variation to the contract becomes necessary to verify the requirement.
 - #4C: Trust between the parties.

25.5 Overview of efficiency and effectiveness creating aspects on the project

Table 102: Overview of efficiency and effectiveness creating aspects on project Bijlmerweide

Creating efficient and effective CM process (score 3-4)	
<i>(2) Clear and efficient change management procedure</i>	
(2) Use of standard form and change register	
(3) To a large extent, the risks are allocated to the party best able to manage them	
(7) Overall change management approach is largely proactive	
(7) Discuss variations informally prior to the formal procedure	
(7) Early informal notification of variation by means of phone call or email	
(7-16) Efficient change management process as most variations are relatively small	
(x) Trust between the parties	
(x) Clearly defined verification and validation system as many variations occur in the quality management processes	
Could be done better to create efficient and effective CM process (score 2-2.5)	
(1) Change management objectives aligned regarding the procedure, but not regarding the results	
(1) No mutual risk management objectives regarding the results	
(3) Ultimate risk allocation is unclear	
(3) Only a small risk allowance for the Contractor's risks	
(4) Limited joint risk management procedure and roles therein are unclear	
(4) Both parties are responsible for their own risk management	
(4) Overall risk management approach is half reactive/half proactive to largely proactive	
(4) Risk management is not closely related to change management	
(7-16) Standard change management processes are applied to a large extent.	
(7-16) Overall the change management procedure is not followed as consistent as should be in order to increase efficiency	
(15) Use of standard forms and change register to create a basic audit trail	
Creating inefficient and ineffective CM process (score 1-1.5)	
(3) No risk sharing	
(5+6) The parties do not create lessons learned specifically from change events, learning from changes happens informally and unknowingly. The parties only audit the adherence to the risk management procedure.	

BOLD = (Related to) condition of contract, ITALIC = Amendment to contract, GREY = Important aspect

25.6 Most important components according to the interviewees

Table 103: Ranking of the components by interviewees of Bijlmerweide

Components for building and sustaining trust					Components for an efficient and effective change management process				
	49	1.	Joint problem-solving	C	31	1.	Early warning		
	45	2.	Reasonable behaviour	C	25	2.	Clearly defined change management procedure and roles/responsibilities therein		
	42	3.	Joint goal setting						
	40	4.	Trustworthiness: Culture, policy		24	3.	Equitable risk allocation		
C	37	5.	Repeated fulfilment of communications and interactions		24	4.	Joint goal setting for change management & risk management		
	35	6.	Equitable risk allocation	C	22	5.	Risk management system		
	35	7.	Trustworthiness of person: Track record, reputation, competences (financial, technical)	C	14	6.	Appropriate documentation of the change process		
				C	14	7.	Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.		
	29	8.	Trustworthiness of organization: Track record, reputation, competences (financial, technical)						
	27	9.	Problem-solving at the lower levels						
C	24	10.	Clearly defined communication system		8	8.	Learning from changes and sharing this knowledge		
	16	11.	Emotional investments		8	8.	Quality management system (ISO9001)		
	11	12.	System for continuous improvement of the relationship						

26. Drachtsterweg: Interview questionnaire

Opening (15.00 – 15.15u)

- Kennismaken (rol/functie)
- Uitleg onderzoek (onderwerp, case study opzet)
- Uitleg interview opzet (doel, duur, opzet vragen, data analyse)

Vragen trust (15.15 – 16.05u)

Q1.Q2.Q3. Trustworthiness

Trustworthiness	(1) Seek partner with good track record, reputation and competence of financial and risk management
	(2) Seek partner with similar culture/policy
	(8) Reasonable behaviour (=working fairly and professionally)

1. De eerste vragen gaan over de aanbesteding. Was u zelf betrokken bij de aanbestedingsfase? (verder als JA)

15.15 (1)+(2) De aanbestedingsprocedure bestond uit een selectiefase en een gunningsfase. Volgens de Selectieleidraad is er tijdens de selectiefase een voorselectie van aannemers gemaakt aan de hand van de uitsluitingsgronden uit het ARW 2005 (deelneming aan een criminele organisatie, omkoping, fraude of witwassen van geld, faillissement, belastingschuld etc.) en minimumeisen met betrekking tot financiële en economische draagkracht en technische bekwaamheid (minimale jaaromzet, referentieprojecten, kwaliteitssysteemcertificaat en veiligheidscertificaat).

1. OG: Waren deze uitsluitingsgronden en minimumeisen voldoende om te bepalen hoe betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) de aannemers zijn om het werk uit te voeren?
2. ON: Waren de uitsluitingsgronden en minimumeisen voldoende om aan te tonen dat de aannemer betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) is om het werk uit te voeren? (Proportioneel aan het werk dat uitgevoerd moet worden)
3. xWaren er nog andere factoren die invloed hadden op de voorselectie?
4. Deze uitsluitingsgronden en minimumeisen werden gesteld aan de organisatie. Is er ook op persoonlijk niveau onderzocht door de OG in hoeverre de vertegenwoordigers van de ON betrouwbaar zijn?

15.20 Volgens de Inschrijvingsleidraad zijn de inschrijvingen enkel beoordeeld op CO2- bewust Certificaat-niveau en inschrijvingsprijs. De Economisch Meest Voordelige Inschrijving (EMVI) werd bepaald door de fictieve korting van de inschrijvingsprijs af te halen. Het Plan van Aanpak van de aannemers (m.b.t. oplossingsrichting, bouwfasering, planning, risico's, omgeving en verkeersdoorstroming) werd tijdens de individuele informatie-uitwisselingsrondes besproken.

1. xWaarom was het PvA geen gunningscriterium?
2. Hadden de individuele informatie-uitwisselingsrondes invloed op het vertrouwensniveau tussen de partijen door de bespreking van het PvA?

>eerst naar Q4 objectives

15.30 (8) Deze vraag gaat over redelijk gedrag. OG en ON worden beschermd tegen opportunistisch gedrag van de ander door 'redelijkheid en billijkheid' uit het Burgerlijk Wetboek (BW).

1. Heeft 'redelijkheid en billijkheid' uit het BW invloed op het gedrag van OG en ON?

Daarnaast komt 'redelijkheid en billijkheid' ook voor in het UAC-IC 2005 in o.a. §4 (5) (verplichtingen van de ON om alles volgens redelijkheid en billijkheid te doen), §14 (6) (weigeringgronden o.b.v. redelijkheid en billijkheid voor wijzigingen vanuit OG) en §44 (1) (kostenvergoeding en/of termijn verlenging o.b.v. redelijkheid en billijkheid).

2. Heeft 'redelijkheid en billijkheid' uit het UAC-IC 2005 invloed op het gedrag van OG en ON?

Redelijk gedrag komt ook terug in de Samenwerkingsafspraken. Het gaat bijvoorbeeld om 'afspraken nakomen', 'eerlijk en open', en 'eerlijk zeggen wat jij vindt en hoe het zit'.

3. Hebben de Samenwerkingsafspraken invloed op het gedrag van OG en ON?

Q4. Objectives

Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)

15.25 (3) Deze vraag gaat over de projectdoelen. Volgens de projectdocumenten is er een Project Start-Up meeting geweest waarbij het teamdoel en elkaars belangen zijn besproken. Vervolgens zijn er concrete Samenwerkingsafspraken gemaakt.

1. Worden deze afspraken tijdens het project nagekomen door beide partijen? (Zijn de afspraken en regels effectief?)

De OG heeft zijn doelstellingen met betrekking tot het projectresultaat opgenomen in het Contractbeheersplan. De projectdoelstellingen van de ON zijn opgenomen in het Projectmanagementplan.

2. Zijn deze projectdoelen afgestemd tussen OG en ON? Worden de gemaakte afspraken nagekomen door beide partijen?

>terug naar Q1 trustworthiness

Q5.Q6. Communication

Communication	(4) Clearly defined system of communication procedures and approaches
	(9) Repeated fulfilment of communications/interactions

15.35 (4) De volgende twee vragen gaan over communicatie tussen OG en ON. In het Contractbeheersplan en het Projectmanagementplan zijn plannen opgesteld voor communicatie en informatie tijdens het project tussen OG en ON. Het gaat onder andere om een overlegschema, standaard formats, informatiestromen, communicatiemiddelen (DMS), documentbenaming en procedures voor facturatie en VTW's.

1. Houden OG en ON zich aan deze opgestelde communicatie- en informatieplannen tijdens het project? (Werkt het goed? Problemen?)

15.40 (9) Naast formele communicatie is volgens de gemaakte samenwerkingsafspraken informele communicatie ook erg belangrijk. Informeel contact staat zelfs op de eerste plaats in de top 5 samenwerkingsafspraken.

1. Wat wordt er tijdens het project gedaan om deze afspraak na te komen?

Q7. Problem solving

Problem solving	(5) Adopt joint problem-solving philosophy
	(10) Problem-solving to mutual satisfaction at the lower levels

15.45 (5) + (10) Deze vraag gaat over problemen oplossen. Volgens de Basisovereenkomst art. 18 worden geschillen niet ter beslechting voorgelegd aan de Raad van Deskundigen. In plaats daarvan is een artikel opgenomen waarin staat dat verschillen van meningen zoveel mogelijk langs minnelijke weg zullen worden opgelost. Alle onopgeloste verschillen van meningen worden gezien als geschillen en zullen beslecht worden door de Voorzieningenrechter te Leeuwarden.

1. Waarom is ervoor gekozen om de Raad van Deskundigen niet in schakelen voor geschillenbeslechting? Welke problemen worden hiermee opgelost of vermeden?
2. Waarom is er gekozen voor de Voorzieningenrechter? Wordt door het toegevoegde artikel niet iemand de gang naar de rechter ontnomen en tevens een definitieve uitspraak vermeden?

Daarnaast zijn er ook Samenwerkingsafspraken gemaakt over problemen oplossen: 'Afwijkingen tijdig aankondigen', 'Geen rug tegen de muur situaties' en 'termijn afspreken waarbinnen een discussie/probleem afrond'.

3. Wat wordt er tijdens het project gedaan om problemen langs minnelijke weg op te lossen? (Vroegtijdige waarschuwing?/Samen naar oplossing zoeken?)
4. Zijn tot nu toe alle problemen langs minnelijke weg opgelost? (Wel geëscaleerd?)

Q8. Risk allocation

Risk allocation	(6) Draft a clear, unambiguous and equitable contract

15.50 (6) Deze vraag gaat over risicoverdeling. In Annex 12 van de Basisovereenkomst is een risicoverdeling tussen opdrachtgever en opdrachtnemer opgenomen als aanvulling op §4 (verplichtingen van de ON), §13 (bodemaspecten) en §41 (schade aan het werk) van het UAC-IC 2005. De risico's zijn wat specifiekere beschreven in de Annex, maar lijken over het algemeen reeds gedekt te zijn in het UAC-IC 2005.

1. Waarom is deze aanvulling toegevoegd? Welke problemen worden hiermee opgelost of vermeden?
2. Hoe is bepaald wie de risicodrager is? Worden risico's zoveel mogelijk doorgeschoven naar de andere partij? Worden risico's toebedeeld aan de partij die het beste in staat is om deze te beheren?
3. Zijn er risico's die gedeeld worden door OG en ON qua aansprakelijkheid? (risicopot, delen van de verliezen en de winsten).
4. xWordt de partij beloond voor het dragen van een risico?

Q9. Continuous improvement

Continuous improvement	(7) Agreed system for achieving continuous improvement of the relationship
	(11) Emotional investments (e.g. by formalized team building workshops)

15.55 (7)+(11) Deze vraag gaat over het continu verbeteren van de relatie tussen OG en ON. Tijdens de Project Start-Up is er een kennismakingsoefening gedaan met als doel elkaar beter te leren kennen. Daarnaast zijn de belangen van de partijen besproken en zijn er Samenwerkingsafspraken gemaakt. Tijdens de Project Follow-Up, 10 maanden later, is er gereflecteerd op de samenwerking en zijn de mogelijke verbeterpunten besproken.

1. Hebben deze twee meetings de relatie tussen OG en ON verbeterd? (Deed iedereen serieus mee?/Worden afspraken nagekomen?)

Mogelijke verbeterpunten van de laatste PFU waren o.a. marge houden omdat ontwerp en uitvoering door elkaar lopen, minder ter acceptatie voorleggen, waarmaken van gezamenlijke belofte naar omgeving, snellere besluitvorming, afstemmen over invulling D&C contract).

2. Zijn de mogelijke verbeterpunten na de meeting aangepakt?
3. Is er een systeem of zijn er maatregelen afgesproken tussen OG en ON ten behoeve van het continu verbeteren van de relatie?

Q10. Other systems or processes

16.00 De gestelde vragen over vertrouwen hadden allemaal betrekking op systemen en processen die volgens de literatuur relevant zijn voor het creëren en behouden van vertrouwen tussen de partijen. (Zie 1.4 voor lijst componenten)

1. Zijn er overige systemen of processen in het project die relevant zijn voor het creëren en behouden van vertrouwen tussen OG en ON?

Vragen change management (16.05 – 16.40u)

Q1. Objectives

Anticipate change	(1) Align project goals and objectives

16.05 (1) De eerste vraag gaat over de doelstellingen met betrekking tot wijzigingenbeheer en risicomanagement. Volgens het Contractbeheersplan is de doelstelling van de OG met betrekking tot wijzigingenbeheer 'het minimaliseren van scopewijzigingen en meerwerk'.

3. Is deze doelstelling van de OG afgestemd met die van de ON? M.a.w. zijn er gedeelde doelstellingen m.b.t. wijzigingenbeheer? (m.b.t. resultaat, procedures, relatie). Worden de gemaakte afspraken nagekomen?

Volgens Vraagspecificatie Deel 2 is de doelstelling van de OG met betrekking tot risico management 'het identificeren en beheersen van risico's ten behoeve van het beheerst laten verlopen van het ontwerp- en uitvoeringsproces'.

4. Is deze doelstelling van de OG afgestemd met die van de ON? M.a.w. zijn er gedeelde doelstellingen m.b.t. risicomanagement? (m.b.t. resultaat, procedures, relatie). Worden de gemaakte afspraken nagekomen?

Q2. Risk allocation

Anticipate change	(3) Agree on project philosophy with regard to risk allocation and type of changes to consider

Zie Q5 van trust.

Q3. Risk management

Anticipate change	(4) Prior identification of areas where changes likely occur (e.g. by risk management)

16.10 (4) Deze vraag gaat over risico management. In het Contractbeheersplan en de Vraagspecificatie Deel 2 zijn plannen en eisen opgesteld voor risico management uit te voeren door de OG en de ON tijdens het project. De eisen zijn vervolgens uitgewerkt tot concrete plannen door de ON in het Project Management Plan. Het gaat onder andere om de rolverdeling en de verantwoordelijkheden, het opstellen en bijhouden van risicodossiers, het houden van risicosessies, het analyseren van risico's, en het afstemmen met het risicodossier van de andere partij.

1. Houden OG en ON zich aan deze risk management plannen en eisen tijdens het project?
2. In hoeverre worden risico's proactief aangepakt door OG en ON? Voorbeeld? (geheel reactief, grotendeels reactief, half reactief/half proactief, grotendeels proactief, geheel proactief)
3. Speelt risicomanagement een rol in de VTW-procedure?

Q4.Q5.Q6. Change management procedure

Anticipate change	(2) Clearly defined change management procedures and processes and roles and responsibilities therein
	(3) Agree on project philosophy with regard to risk allocation and type of changes to consider
Recognize change	(8) Early identification of potential changes
	(9) Standard change management process: Assess potential impact (e.g. by value engineering) and create a proposed change order
	(10) Standard change management process: Document the proposed change in a log
Evaluate change	(11) Standard change management process: Determine priority of the change
	(12) Standard change management process: Selection of optimum change options by consulting all relevant parties
	(13) Standard change management process: Identify the likely impacts of different change options
	(14) Standard change management process: Prompt decision making with due authority as to whether to accept/reject the change

Resolve change	(15) Standard change management process: Communicate final change decision to all team members whose work is affected by it
	(16) Appropriate documentation to record all decisions within the change process
Monitor implementation	(5) Monitor and record implementation

16.15 (2) + (3) De komende vragen gaan over de wijzigingsprocedure. In het Contractbeheersplan en het Projectmanagementplan is de procedure voor Verzoek Tot Wijziging (VTW) opgenomen. Volgens deze procedure maakt de ON altijd de VTW op. Hierbij moet de ON §14 en §15 van het UAC-IC 2005 in acht nemen (Vraagspecificatie Deel 2 – Eis-008). Volgens Annex 14 van de Basisovereenkomst zijn enkele clausules die te maken hebben met de wijzigingsprocedure komen te vervallen (§14 lid 13 t/17 en §47). De gevolgen hiervan zijn dat er geen Raad van Deskundigen wordt ingeschakeld voor de beslechting van geschillen, dat de wijziging niet vervalt als er geen prijsovereenkomst is en dat de ON geen kostenvergoeding en/of termijnverlening krijgt als gevolg van vertragingen tijdens de wijzigingsprocedure. Daarnaast lijken t.o.v. de wijzigingsprocedure uit het UAC-IC 2005 een aantal stappen te zijn vervallen in de opgestelde VTW-procedure, zoals de toets of ON verplicht is de wijziging uit te voeren en de automatische acceptatieregeling.

1. Waarom is ervoor gekozen om af te wijken van de wijzigingsprocedure uit het UAC-IC 2005? Welke problemen worden hiermee opgelost of vermeden?
2. Welke sub clausules van §14 (wijzigingen OG), §15 (wijzigingen ON) en §45 (procedure prijsaanbieding) van het UAC-IC 2005 zijn nog wel van toepassing? Worden deze ook daadwerkelijk gebruikt?
3. Houden OG en ON zich aan de opgestelde VTW-procedure tijdens het project?
4. xHoe efficiënt en effectief werkt deze VTW-procedure tijdens het project? (Zijn er problemen?/Zijn alle rollen en verantwoordelijkheden duidelijk?)

16.20 (8) Volgens het UAC-IC 2005 §4 (7) is de ON verplicht de OG te waarschuwen voor klaarblijkelijke fouten in onder andere de Vraagspecificatie, de Basisovereenkomst, ter beschikking gestelde informatie en goederen van de OG, en opgedragen wijzigingen door de OG. In Annex 14 van de Basisovereenkomst staan de wijzigingen van de UAC-IC 2005 en hierin staat §3 aangevuld wordt met een controle- en waarschuwingsplicht voor de ON voor dergelijke documenten van de OG. De aanvulling lijkt een extra controle- en waarschuwingsplicht toe te voegen aan de reeds aanwezige waarschuwingsplicht in het UAC-IC 2005.

1. Waarom is deze aanvulling toegevoegd? Welke problemen worden hiermee opgelost of vermeden?
2. Voldoet de ON aan deze controle- en waarschuwingsplicht tijdens het project?
3. In hoeverre worden wijzigingen proactief aangepakt door OG en ON? (=wijzigingen ver van tevoren aan ziet komen en impact proberen te minimaliseren) (geheel reactief, grotendeels reactief, half reactief/half proactief, grotendeels proactief, geheel proactief)
4. Spelen de extra controle- en waarschuwingsplicht en de standaard waarschuwingsplicht hier nog een rol in?

16.25 (5) + (9-16) De VTW-procedure geeft niet de gedetailleerde stappen weer. Daarom volgt nu een vraag hierover. De vraag heeft betrekking op de gehele VTW-procedure, dus zowel aan OG's als ON's zijde.

1. xZijn de volgende activiteiten onderdeel van de VTW-procedure?

Recognize change	8. Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	x
	9. Het wijzigingsvoorstel opnemen in een logboek	x
Evaluate change	10. De prioriteit van de wijziging bepalen	x
	11. Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	x
	12. De impacts van de verschillende wijzigingsopties bepalen	x
	13. (Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	x
Resolve change	14. Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	x
	15. Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	x
Monitor implementation	5. De uitvoering van de wijziging monitoren en documenteren.	x

Q7. Continuous improvement

Learn from change	(6) Conduct a review and create lessons learned from the change event
	(7) Update shared databases and incorporate lessons learned for project and organization

16.30 (6)+(7) Deze vraag gaat over leren van de wijziging. In de projectdocumenten heb ik niks kunnen vinden over het leren van wijzigingen en het delen van deze kennis.

1. Worden tijdens het project 'lessons learned' gecreëerd van wijzigingen (evaluatie, root cause analyse, hoe voorkomen).
2. Wordt deze kennis gedeeld tussen OG en ON?
3. xWordt de performance (efficiëntie en effectiviteit) van de risk management processen tijdens het project gemeten en bijgestuurd?

Q8. Other systems or processes

16.35 De gestelde vragen over wijzigingen hadden allemaal betrekking op systemen en processen die volgens de literatuur relevant zijn voor het een efficiënt en effectief wijzigingsproces. (Zie 1.4 voor lijst componenten)

1. Zijn er overige systemen of processen in het project die relevant zijn voor de efficiëntie en effectiviteit van het wijzigingsproces? (Reeds besproken aspecten laten zien)

Extra vragen losstaand van het project (16.40 – 16.55u)

16.40 TRUST:

1.	Betrouwbaarheid organisatie: Track record, reputatie, competenties (financieel, technisch)
2.	Betrouwbaarheid persoon: Track record, reputatie, competenties (financieel, technisch)
3.	Betrouwbaarheid: Cultuur, beleid
4.	Gedeelde projectdoelen
5.	Duidelijk communicatiesysteem
6.	Samen problemen oplossen
7.	Eerlijke/proportionele risicoverdeling
8.	Systeem voor continu verbeteren van de relatie
9.	Veel communicatie en interacties
10.	Problemen oplossen op het eerste niveau
11.	Emotionele investeringen
12.	Redelijk gedrag

Q11. Effectiveness of the systems or processes

2. Welke systemen of processen zijn het meest effectief voor het creëren en behouden van vertrouwen tussen OG en ON? (Ranking maken met de besproken aspecten in de vorm van kaartjes, extra blanco kaartjes voor eventuele aanvulling)

Q12. Trust clauses in contracts

2. Welke systemen of processen zou u opnemen in het contract met betrekking tot vertrouwen tussen OG en ON? (Kiezen uit de besproken aspecten en eventuele aangevulde aspecten)

16.45 CHANGE MANAGEMENT:

1.	Gedeelde projectdoelen voor wijzigingenbeheer & risicomanagement
2.	Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
3.	Eerlijke/proportionele risicoverdeling
4.	Risicomanagement systeem
5.	Leren van wijzigingen en kennis hiervan delen
6.	Vroegtijdige waarschuwingsplicht
7.	Adequate documentatie van de wijziging
8.	Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren

Q9. Importance of the systems or processes

2. Welke systemen of processen zijn het belangrijkste voor de efficiëntie en effectiviteit van het wijzigingsproces? (Ranking maken met de besproken aspecten in de vorm van kaartjes, extra blanco kaartjes voor eventuele aanvulling)

Q10. Change clauses in contracts

2. Welke systemen of processen zou u opnemen in het contract met betrekking tot wijzigingen? (Kiezen uit de besproken aspecten en eventuele aangevulde aspecten)

16.50 INVLOED

Q11. Influence of trust on effectiveness and efficiency of change management process

De onderwerpen ‘vertrouwen’ en ‘wijzigingen’ zijn bewust gekozen voor dit afstudeeronderzoek en staan niet los van elkaar. Het hoofddoel van het onderzoek is om te onderzoeken hoeveel invloed het vertrouwensniveau tussen OG en ON heeft op de effectiviteit en efficiëntie van het wijzigingsproces.

Effectiviteit (=doeltreffendheid) is een indicator voor de mate dat het doel bereikt is = $\frac{\text{werkelijke prestatie}}{\text{normatieve prestatie}}$

Efficiëntie (=doelmatigheid) is een indicator voor de hoeveelheid middelen die ingezet zijn om het doel te bereiken = $\frac{\text{feitelijke inspanning}}{\text{normatieve inspanning}}$

3. Voor hoeveel % wordt de effectiviteit van het wijzigingsproces beïnvloed/bepaald door het vertrouwensniveau tussen OG en ON?
4. Voor hoeveel % wordt de efficiëntie van het wijzigingsproces beïnvloed/bepaald door het vertrouwensniveau tussen OG en ON?

(0% geen invloed, 25% weinig invloed, 50% veel invloed, 75% heel veel invloed of 100% compleet beïnvloed)

Afsluiting (16.55 – 17.00u)

- o Verslag en validatie
- o Anonimiteit?
- o Eventueel overige vragen per mail
- o Verbeteringen interview?
- o Onderzoeksrapport opsturen

27. Drachtsterweg: Interview reports

INTERVIEW VERSLAG #1E

Interview:	Project Drachtsterweg t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	07-10-2014
Tijd:	16.30 – 18.30u
Locatie:	Provinciehuis Leeuwarden (Tweebaksmarkt 52)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	05-01-2015
Gevalideerd (DD/MM/JJJJ):	19-01-2015 (automatisch)

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
SH	Sieds Hoitinga	Programmanager	Provincie Fryslân	-

2. Antwoorden op de interviewvragen over ‘vertrouwen’	
Betrouwbaarheid bij aanbesteding	
- De uitsluitingsgronden en de minimeisen waren voldoende en <u>bewust</u> geformuleerd om te bepalen hoe betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) de aannemers waren om het werk uit te voeren. In de basis hanteert de OG lagere criteria dan andere opdrachtgevers, omdat de OG vindt dat meerdere partijen geschikt zijn voor dit soort werkzaamheden. - Betreft andere factoren die van invloed geweest op de voorselectie van aannemers. Ik denk dat er een loting was in dit project. Dit was een <u>bewuste</u> keuze als regionale OG om de kleinere aannemers die ook voldeden aan de selectiecriteria een kans te geven. Door de loting kreeg elke aannemer een gelijke kans, want zonder loting krijgen de partijen die het meeste gedaan hebben, dit zijn meestal de grote aannemers, een grotere kans. Elke aannemer mocht zich inschrijven voor de eerste ronde, maar voor de volgende ronde waren slechts 5 plaatsen beschikbaar die ingevuld werden d.m.v. de loting. Hierdoor hoefden niet alle inschrijvers hoge kosten te maken om een aanbod samen te stellen en bleef de kostenvergoeding door de OG beperkt. In de basis is de kostenvergoeding 1,5% van de bouwsom, hiermee kan de OG 25-50% van de tenderkosten van de aannemers vergoeden. Door het beperkt aantal deelnemers in de laatste ronde, blijft de vergoeding per deelnemer redelijk. - Op persoonlijk niveau zijn er tijdens de aanbesteding <u>geen</u> eisen gesteld aan de werknemers van de ON. Dit mag niet volgens de Europese aanbestedingsregels. - De individuele informatie-uitwisselingsrondes hadden <u>geen</u> invloed op de gunning van het werk, maar <u>wel</u> op het vertrouwensniveau tussen de OG en de ON. Ik was <u>niet</u> direct betrokken bij de uitwisselingsrondes. - De samenstelling van het team van de OG betrokken bij de uitwisselingsrondes is per definitie <u>niet</u> hetzelfde als bij de beoordeling van de EMVI documenten. Tijdens de uitwisselingsrondes kan de ON bij de OG polsen of hij een beetje op de goede weg zit en kan vragen stellen. Het is nogal een juridisch circus, want de OG mag geen aanwijzingen of verbeterpunten geven. Bovendien moet elke vraag die gesteld wordt beoordeeld worden om te bepalen of elke inschrijver het betreffende aspect moet weten. De uitwisselingsrondes gaan wel degelijk over hoe de partijen over komen op de OG, maar dit heeft geen invloed op de EMVI-beoordeling van de inschrijving. Hierdoor is het mogelijk dat de partij die het vervelendst deed tijdens de uitwisselingsrondes de opdracht gegund krijgt. Dit is ook gebeurd in het project. - In het begin van het project hebben de uitwisselingsrondes <u>wel</u> invloed gehad op het vertrouwensniveau tussen de OG en de ON, want de partij die het vervelendst was (i.e. niks vertellen en onaangenaam richting de OG), was het geworden. Echter, over het algemeen is bij de ON het tenderteam niet hetzelfde als het uitvoeringsteam. De PSU is daarom veel bepalender geweest voor het vertrouwensniveau tussen de partijen, want toen kon de OG met het uitvoeringsteam goede afspraken maken over hoe de samenwerking gaat verlopen tijdens het project.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW heeft <u>wel</u> invloed op het gedrag van de partijen, maar dit hangt af van het escalatieniveau. - Op de directe werkvloer (het laagste niveau) escaleren zaken vaak naar ‘hullie en zullie’ gedrag. De partijen hebben het BW niet in gedachte, maar handelen meer uit emotie en toestanden. Zowel het team van de OG als de ON maakt heel vaak de fout dat ze ruziën over iets waar ze niet over gaan. De partijen moeten daarom vooraf afspraken maken over wie waarover gaat om te voorkomen dat dingen besproken worden door mensen die daar niet over gaan. Verschillen van meningen moeten dan alleen signaleerd en geëscaleerd worden zonder ruzie erover te maken. - In dit project proberen de partijen het ‘hullie en zullie’ gedrag te doorbreken door zaken op het hoogste escalatieniveau te bespreken op hoofdlijnen. Op dit niveau waar de mandaten liggen, spelen redelijkheid en billijkheid wel degelijk een rol. Deels is dit vanwege het BW en deels omdat de partijen eruit moeten komen. De zaken worden samen bekeken om te bepalen of ze zwartwit of grijs zijn in het contract om vervolgens afspraken erover te maken. Redelijkheid en billijkheid zit tevens in het achterhoofd vanwege een mogelijke rechtszaak. - De gemaakte Samenwerkingsafspraken hebben <u>geen</u> invloed op het gedrag van de partijen. De afspraken hebben ongeveer één week effect. De belangen van de partijen zijn zo tegengesteld, waardoor je het zo snel kwijt raakt als je niet oppast. Op het managementniveau gebeurt dit niet, maar op de werkvloer is het ‘hullie en zullie’ gedrag erg groot. Dit geldt over het algemeen voor elk contract. De oplossing is om meer te denken over escalatieniveaus, dat beter vastleggen en daarover vooraf duidelijke afspraken over te maken. Dit zit niet voldoende in dit project.	
Projectdoelen	
De gemaakte Samenwerkingsafspraken worden tot nu toe <u>niet</u> nagekomen door beide partijen. Bij andere projecten van dezelfde OG zijn zulke afspraken ook gemaakt, maar bij geen één project verloopt de samenwerking soepel volgens de afspraken.	

▪ Het volgende gaat over het algemeen <u>niet</u> goed voor elk contract en heeft te maken met afstemming inhoudelijke zaken, tijdigheid, focus op het doel en openheid: Ten eerste, de kwaliteit van de toetsingsdocumenten is niet goed en er wordt niet op tijd gereageerd erop. Ten tweede, het ontwerp wordt niet op tijd gerealiseerd door de ON, zodat hij onder druk komt te staan met de uitvoering. ▪ Ik weet <u>niet</u> of de doelen m.b.t. het projectresultaat zijn afgestemd tussen OG en ON. Ik kan het me <u>niet</u> voorstellen, want de belangen zijn tegengesteld. De OG wil o.a. zo min mogelijk scopewijzigingen en meerwerk, terwijl de ON o.a. zo veel mogelijk winst wil. Dit zijn algemene belangen van de partijen. Het hoofddoel is wel afgestemd en is dat het werk een keer klaar komt.
Communicatie ▪ De partijen houden zich aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Ik ben hier <u>niet</u> direct bij betrokken, maar als de plannen zijn afgesproken dan wordt daar op geleverd en gestuurd. Echter, over het algemeen worden de formele procedures pas bewandeld na veel informeel contact voorafgaand. ▪ Er is veel informeel contact tussen OG en ON via de regelmatige PFU's, via de telefoon (e.g. tussen Edward en André), door co-locatie op de Wiardaplantage en door veel gezamenlijk naar buiten te treden (e.g. dag van de bouw, gezamenlijke bezoekersruimte en communicatie richting de burgers). De reguliere informele overleggen zijn gestructureerd en dus niet echt informeel. Buiten de gestructureerde overleggen weten de partijen elkaar makkelijk te vinden als er iets aan de hand is.
Problemen oplossen ▪ Er is gekozen om de Raad van Deskundigen (RvD) niet in te schakelen voor geschillenbeslechting (Basisovereenkomst art. 18), omdat als de partijen er langs minnelijke weg uitkomen, is dit goed, anders hebben we in Nederland een rechtssysteem waarbij geschillen voor de rechter gebracht kunnen worden. Een RvD of een intermediair is dus hiervoor niet nodig. ▪ Er is gekozen om de Raad van Arbitrage (RvA) niet in te schakelen voor geschillenbeslechting (volgens Basisovereenkomst art. 18 is par. 47 vervallen), omdat de Raad van Arbitrage (RvA) in de basis partijdig is voor de ON want over het algemeen bestaat de RvA uit mensen uit de aannemerij. Dit is mijn mening die doorgevoerd is in alle contracten die ik doe en is tevens volgens het algemeen beleid van de Provincie voor grote projecten. De rechter daarentegen is onafhankelijk. ▪ Er is gekozen voor de Voorzieningenrechter, want als je niet naar de RvA gaat, maar naar de rechtbank, dan is dit standaard de rechter die over dit soort geschillen gaat. De keuze is tevens volgens het algemeen beleid van de Provincie voor grote projecten en staat ook in de Aanbestedingsleidraad. In kleine projecten is wel gekozen voor de RvA. ▪ Volgens de aanvulling op art.18 van de Basisovereenkomst moeten geschillen <u>altijd eerst</u> voorgelegd worden aan de Voorzieningenrechter. Dit geldt ook voor geschillen tijdens de aanbesteding. Na de uitspraak kunnen de partijen altijd nog in hoger beroep gaan. Over het algemeen legt de OG zich neer bij de eerste uitspraak, de OG is ooit één keer in hoger beroep gegaan. De OG heeft nog nooit in het kader van het contract voor de rechtbank gestaan, wel voor de aanbesteding. ▪ Problemen worden langs minnelijke weg opgelost door op het hoogste escalatieniveau problemen samen te nemen om deze vervolgens met een helikopterview te bekijken (i.e. bepalen eigen standpunt en de aspecten die je bereid bent toe te geven) en te zoeken naar gemeenschappelijke delen waar beide partijen tevreden over zijn. Vervolgens maken de partijen een deal, bijvoorbeeld 50/50 of 60/40. ▪ Problemen gaan altijd over geld en kunnen dus alleen op het hoogste escalatieniveau besproken en opgelost worden. Op het contractbeheerniveau (lagere niveaus) moeten de partijen het <u>niet</u> over geld hebben, want dan gaan ze over elk individueel probleem ruzie maken en kom je er ook nooit uit, want de aspecten zijn nooit zwartwit in het contract. Over het algemeen probeert de ON zoveel mogelijk claims neer te leggen door aan te tonen dat het contract niet goed is. In dit project heeft de OG de contractbeheerder opgelegd dat het contract goed is en dat hij altijd 'nee' moet zeggen tegen de ON. De belangen van de partijen botsen dan en op individueel case niveau krijg je veel zwartwit redeneringen tegenover elkaar. Op het hoogste escalatieniveau kan je pas het totaalplaatje zien (i.e. welke aspecten zwartwit of grijs zijn) om vervolgens een deal te maken. ▪ Tot nu toe zijn alle problemen langs minnelijke weg opgelost, maar dat wil <u>niet</u> zeggen dat de partijen geen druk hebben moeten uitoefenen op elkaar. Ik verwacht geen rechtszaken in dit project. De drempel naar de rechter is groter dan naar de RvA.
Risicoverdeling ▪ De aanvullende risicoverdeling tussen OG en ON is <u>bewust</u> toegevoegd aan de Basisovereenkomst (annex 12) om de risicoverdeling af te stemmen op het ondergronds bouwen. Normaal gesproken liggen de ondergrondse risico's bij de OG. Bij de aanbesteding heeft de OG gedegen onderzoek meegestuurd zodat de aannemers tot een meest optimale en zo creatief mogelijke oplossing konden komen. Het risico van de juistheid en de conclusies van het onderzoek is voor de OG. De OG gaat ervan uit als het onderzoek goed blijkt te zijn, dat het risico van hoe de ON daarmee omgaat (i.e. zijn uitvoeringsmethode) voor de ON is. ▪ De OG bepaalt de risicoverdeling. Bij het bepalen van de risicodragers worden risico's toebedeeld aan de partij die het beste in staat is deze te beheren. De uitvoeringsmethode is de keuze van de ON, daarom is het ook zijn risico. De OG is echter verantwoordelijk voor de verstrekte onderzoeksresultaten. ▪ Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. ▪ De ON wordt beloond voor het dragen van het risico via een risicoreservering in de inschrijfsom. Dit bepaalt de ON zelf. Bovendien staan er bonussen en boetes op de mijlpalen in het contract, omdat het niet halen van de mijlpalen de OG veel geld zal kosten.
Continu verbeteren van de relatie ▪ De PSU en de PFU hebben de relatie tussen OG en ON verbeterd. Ik was <u>niet</u> bij de PFU, maar wel bij de PSU o.a. om te vertellen hoe de OG erin staat m.b.t. de samenwerking. Als je elkaar ontmoet en elkaar kent, worden de relaties over het algemeen beter. Dit geldt zeker als je samen nog eens reflecteert op de gemaakte samenwerkingsafspraken. De relaties in dit project zijn niet slecht en zeker niet het slechtste t.o.v. andere projecten van de OG. Door de PFU's worden ze in de basis beter. ▪ Ik weet <u>niet</u> of de mogelijke verbeterpunten uit de PFU zijn aangepakt. Ik was niet bij de PFU en ben dus niet op de hoogte van de discussiepunten. ▪ Tijdens het project zijn PFU's afgesproken tussen OG en ON ten behoeve van het verbeteren van de relatie. Ik weet <u>niet</u> of er tijdens de PFU's andere maatregelen zijn afgesproken.
Overige systemen of processen ▪ Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON: problemen oplossen op het juiste niveau.

3. Antwoorden op de interviewvragen over 'wijzigingen'	
Projectdoelen	
- De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn <u>niet</u> afgestemd betreft het resultaat, maar deze zijn wel uitgewisseld en besproken o.a. tijdens de PSU. 'Het minimaliseren van scopewijzigingen en meerwerk' is een algemene doelstelling van opdrachtgevers, want als je eenmaal aanbesteed hebt, wil je niet nog eens allerlei contractwijzigingen. Mondeling is de ON het eens met deze doelstelling, maar met het hart zal dit anders zijn. De ON zal zijn eigen doelen en belangen hebben. 'Scopevastheid' zal de ON wel ondersteunen, maar 'het minimaliseren meerwerk' niet. De ON heeft de opdracht namelijk scherp aangeboden en met meerwerk valt geld te verdienen. - De doelstellingen van OG en ON m.b.t. risico management zijn <u>niet</u> afgestemd betreft het resultaat, maar deze zijn wel uitgewisseld en besproken o.a. tijdens de PSU. De ON zal zijn eigen doelen en belangen hebben, maar deze zullen deels overeenkomen met het doel van de OG ('het identificeren en beheersen van risico's ten behoeve van het beheerst laten verlopen van het ontwerp- en uitvoeringsproces'), want iedereen heeft er belang bij als er beheerst met de risico's wordt omgegaan.	
Risico management	
- Ik weet <u>niet</u> of de OG en de ON zich houden aan de opgestelde risico management plannen tijdens het project. Dit hoort wel zo te zijn, maar ik ben <u>niet</u> direct betrokken bij de processen op de werkvloer en controleer het ook niet. - De aanpak van risico's door de OG is grotendeels proactief. In de basis is de doelstelling om risico's geheel proactief aan te pakken. Als je risico's goed beheert, weet je wat erop je af komt de komende periode en ben je er dus ook goed op voorbereid door middel van een beheersmaatregel. Echter, er zijn ook onverwachte risico's, bijvoorbeeld een verkeerd afsluitprofiel bij het aquaduct waardoor het vol met water kwam te staan.	
Wijzigingsprocedure	
- Ik weet <u>niet</u> of de gebruikte VTW-procedure afwijkt van de wijzigingsprocedure uit de UAV-GC 2005 (par. 14, 15 en 45), hier ken ik de UAV-GC 2005 <u>niet</u> goed genoeg voor. Dit zal Edward weten. - Par. 14 lid 13 t/m 15 zijn geschrapt (i.e. <u>geen</u> RvD) om een betere rechtspositie te creëren voor de OG bij geschillen. - Par. 14 lid 16 is geschrapt (i.e. de wijziging vervalt <u>niet</u> als er geen prijsovereenkomst is) om de partijen te dwingen eruit te komen met elkaar. - Par. 14 lid 17 is geschrapt (i.e. <u>geen</u> kostenvergoeding/termijnverlenging voor ON bij vertraging tijdens de procedure) om een prikkel voor de ON weg te nemen om dingen alsmat uit te stellen. - Ik weet <u>niet</u> welke sub clausules van par. 14, 15 en 45 uit de UAV-GC 2005 daadwerkelijk gebruikt worden. Dit zal Edward weten. - De OG en de ON houden zich aan de opgestelde VTW-procedure tijdens het project, maar ik weet <u>niet</u> of deze procedure goed werkt en of er problemen zijn. Normaal gesproken is er vooraf overeenstemming over de ingediende VTW's. Het probleem met de toetsingsdocumenten (i.e. kwaliteit niet goed en niet op tijd reageren) geldt over het algemeen ook voor VTW's. - De aanvulling met de extra controle- en waarschuwingplicht voor de ON in de Basisovereenkomst (annex14) is toegevoegd omdat de OG het belangrijk vindt dat de verstrekte informatie betreft o.a. de geotechnische condities juist is. Bovendien kan de OG hierop terug kan vallen als hij kan aantonen dat de ON wist dat er fouten in de documenten zaten, dit gebeurt echter niet vaak. De OG is verantwoordelijk voor de verstrekte informatie en tijdens de aanbesteding baseren de aannemers hun uitvoeringsmethode op deze informatie. Met de aanvulling probeert de OG de ON te verplichten de juistheid van de verstrekte informatie te controleren. - De ON zal zich <u>waarschijnlijk niet</u> houden aan de extra plichten, maar het aantonen dat de ON een fout had moeten ontdekken blijft moeilijk, want de OG kan de ON niet iets vragen te zien wat de ON niet gezien heeft. De aansprakelijkheid wordt dus niet verschoven naar de ON, want de ON kan altijd aangeven dat hij het niet heeft gezien. Dit soort clausules zijn voor de bühne, want als een ON een fout ziet in de OG's documenten waarvan hij denkt de enige te zijn die dat ziet, dan zou hij er nog flink gebruik van kunnen maken in plaats van de OG van tevoren over te waarschuwen. - De aanpak van wijzigingen door OG en ON is in basis geheel proactief. Deels proactief is niet goed en zou vanuit beide partijen slecht zijn, want dit betekent dat het je overkomt. Het is mogelijk dat het ontwerp verandert terwijl de betreffende delen van het werk al zijn gebouwd, maar dat gebeurt niet in dit project. De OG wil geen onverwachte scopewijzigingen. De ON komt met de invulling van de scope uit het contract. Scopewijzigingen zijn te onderscheiden in binnen en buiten de kaders van het contract. Wijzigingen buiten het contract kunnen alleen door de OG worden aangebracht. Dit gebeurt geheel proactief. Wijzigingen binnen het contract zijn afwijkingen die leiden tot scopewijzigingen (i.e. eerder afgesproken aspecten anders doen) en worden proactief aangebracht door de ON. - Ik weet <u>niet</u> of de volgende processen deel uitmaken van de VTW-procedure en worden uitgevoerd door ON of OG. Ik ben <u>niet</u> direct betrokken bij deze processen.	
9.	Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen
10.	Het wijzigingsvoorstel opnemen in een logboek
11.	De prioriteit van de wijziging bepalen
12.	Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.
13.	De impacts van de verschillende wijzigingsopties bepalen
14.	(Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.
15.	Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.
16.	Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.
5.	De uitvoering van de wijziging monitoren en documenteren.
Opmerkingen:	
Continu verbeteren	
Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Het delen van kennis gebeurt intern bij de OG, want dit projectteam zit voor een deel ook op andere projecten van de OG. De kennisbestuiving tussen projecten is er, maar zou nog wel beter kunnen. Het leren van wijzigingen is geen vaste stap in de wijzigingsprocedure, maar het gebeurt via interactie tussen de medewerkers van verschillende projecten over problemen, oplossingen, aandachtspunten in de contractvoorbereiding, ervaringen met specifieke aannemers etc. Elke VTW wordt dus niet afzonderlijk geanalyseerd, maar wel de bijzondere. Dit gebeurt slechts heel soms.	

De performance van de risico management processen worden tijdens het project <u>niet</u> gemeten en bijgestuurd. Als hetzelfde steeds het projectteam overkomt en elke keer is er paniek, dan zal ik ingrijpen en overleggen met het team om te vragen of ze wel weten waar ze mee bezig zijn. Als het meerwerk meer dan 7% is, zullen er tevens gesprekken plaatsvinden.
Overige systemen of processen
Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingenproces.

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)	
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):	
C	1. Problemen oplossen op het juiste niveau
	2. Samen problemen oplossen
	3. Betrouwbaarheid: cultuur, beleid
	4. Redelijk gedrag
C	5. Systeem voor continu verbeteren van de relatie
C	6. Veel communicatie en interacties
	7. Duidelijk communicatiesysteem
C	8. Problemen oplossen op het eerste niveau
	9. Eerlijke/proportionele risicoverdeling
	10. Gedeelde projectdoelen
	11. Emotionele investeringen
	12. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
	13. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):	
C	1. Vroegtijdige waarschuwingsplicht
C	2. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
C	3. Adequate documentatie van de wijziging
C	4. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
C	5. Risico management systeem
	6. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
C	7. Eerlijke/proportionele risicoverdeling
	8. Leren van wijzigingen en kennis hiervan delen
Invloed vertrouwen op wijzigingenproces	
- De efficiëntie van het wijzigingenproces worden voor <u>80%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er wantrouwen is, gaat de OG onderzoeken of het echt een wijziging is door er zelf meer tijd aan te besteden of er een contra-expertise op te zetten. Als er vertrouwen is, zal de OG eerder accepteren dat het een contractwijziging is, want de OG gelooft erin dat het echt wel een wijziging is. - De effectiviteit van het wijzigingenproces worden voor <u>80%</u> bepaald door het vertrouwensniveau tussen OG en ON. Dit heeft verschillende redenen. Ten eerste, als er vertrouwen is, dan lees je de wijziging anders, want die komen dan verwacht en gaan over zaken die je in de basis makkelijker accepteert. Ten tweede, als er vertrouwen is, kan de OG op de kennis van de ON vertrouwen dat de VTW goed in elkaar zit, dus zijn er minder wijzigingen die niet goed zijn. Ten derde, als er vertrouwen is, is het zender- en ontvanger gehalte veel groter. De intermenselijke relatie is het belangrijkste als het gaat om vertrouwen en effectiviteit van communiceren. De wijzigingsprocedure gaat over communicatie. Als er wantrouwen is, gaan de mensen vooral naar elkaar zenden en de mate waarin je bereid bent naar elkaar te luisteren, te horen en er wat mee te doen is lager.	

INTERVIEW VERSLAG #2E

Interview:	Project Drachtsterweg t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	21-10-2014
Tijd:	15.00 – 17.00u
Locatie:	Kantoor Vrij-Baan Leeuwarden (Snelliusweg 11)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	05-01-2015
Gevalideerd (DD/MM/JJJJ):	13-01-2015

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
EH	Edward Herzog	Assistent projectmanager	Provincie Fryslân	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
- De uitsluitingsgronden en de minimeisen waren voldoende om te bepalen hoe betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) de aannemers waren om het werk uit te voeren. De gestelde criteria kwamen deels uit het ARW en de rest was <u>bewust</u> gekozen om te kleine bedrijven uit te sluiten. Er werd vooral gelet op de competenties (d.m.v. referentieprojecten) en de omvang van het bedrijf. - Er waren <u>geen</u> andere factoren dan die in de Selectieleidraad stonden van invloed op de voorselectie van aannemers. Er was <u>geen</u> loterij in dit project. 8 Partijen hadden zich aangemeld en gingen tevens door naar de gunningsfase, maar 2 hiervan hadden zichzelf teruggetrokken na een afweging van de te maken aanbestedingskosten en hun kansen. - Op persoonlijk niveau zijn er tijdens de aanbesteding <u>geen</u> eisen gesteld aan de werknemers van de ON. Met toegepaste selectie- en gunningsmethode kan je bedrijven binnenhalen die volgens hun track record het project kunnen realiseren, maar de OG heeft hiermee geen invloed op het uitvoeringsteam van de ON. Er is alleen een Eigen Verklaring gevraagd van de aannemers. - Tijdens de individuele informatie-uitwisselingsrondes werden o.a. de oplossingsrichtingen en constructiemethodes van de aannemers besproken. De uitwisselingsrondes hadden <u>geen</u> invloed op de gunning van de opdracht. Deze uitwisselingsrondes hadden <u>wel</u> invloed op het vertrouwensniveau tussen de OG en de ON. - Er zaten partijen bij waarmee vertrouwen werd opgebouwd tijdens de overleggen, maar er was ook een partij waarmee het vertrouwen zodanig werd beschadigd dat de OG overwoog de bijeenkomst te schorsen omdat het uit de hand liep. Het vertrouwen tussen de partijen werd gecreëerd door de competenties van de aannemer en de gehele interactie tussen de partijen. Bij de interactie was het o.a. belangrijk dat de partijen open en eerlijk waren en hadden voor elkaars belangen, zorgen en risico's (i.e. elkaar willen verstaan en horen). De interactie heeft ook als doel gehad het beter wederzijds kunnen interpreteren en inschatten van de risico's om zo een betrouwbaardere aanbesteding te doen en krijgen.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW en de UAV-GC 2005 hebben <u>geen</u> invloed op het gedrag van de partijen. Dit zijn meer standaard principes die je van elkaar mag verwachten in een project, want uiteindelijk willen de partijen samen een project maken en een stap verder komen. Als OG voelen we dat redelijkheid en billijkheid wederzijds moet zijn voor een goede werkverhouding en dus niet van één kant moet komen. - Het BW wordt er <u>nooit</u> bijgehaald, de UAV-GC 2005 <u>wel</u>. De UAV-GC 2005 wordt veel gebruikt in de beoordelingen, bijvoorbeeld om te checken wat de regels ook alweer zijn in een bepaalde context. Het contract (inclusief de UAV-GC 2005) wordt niet alleen erbij gepakt als er problemen zijn zoals de ON dat vindt, maar wordt actief gebruikt en vormt de leidraad in het project. Het contract is bewust zo opgesteld bijvoorbeeld om te borgen dat de afspraken met de omgeving en de stakeholders nagekomen worden. Daarom is het belangrijk het contract er steeds bij te pakken om te checken of de ON voldoet aan de gestelde eisen. - Redelijkheid en billijkheid de UAV-GC 2005 is er <u>niet direct</u> aan de voorkant, maar pas als de standpunten al verscherpt zijn. Dit is logisch, want de invulling van redelijkheid en billijkheid is afhankelijk van de uitgangspunten van de partijen en de exacte vorm en omvang van de feiten. Als er een probleem is, bijvoorbeeld meningsverschil over een contractwijziging, dan worden er stellingen ingenomen door beide partijen. De principes van redelijkheid en billijkheid worden dan gebruikt om de patstelling op te heffen en om tot een oplossing te komen. - Bovendien is redelijkheid en billijkheid ook belangrijk m.b.t. het contract, want deze is <u>nooit</u> compleet en foutloos. De invulling van redelijkheid en billijkheid is niet zwartwit en kunnen leiden tot meningsverschillen tussen de OG en ON. Op het laagste escalatieniveau nemen de OG en de ON soms zwartwit uitgangspunten aan. Om er toch uit te komen, moeten de partijen op een hoger escalatieniveau een oplossing vinden door bijvoorbeeld 'geven en nemen'. - Ik weet <u>niet</u> of het expliciet opnemen van redelijkheid en billijkheid in een aparte clause in de UAV-GC 2005 een toegevoegde waarde heeft, want voor mij zal dat niets uitmaken in hoe ik met de principes om zal gaan. De partijen geven hier namelijk al vooruitlopend invulling aan. Over het algemeen lijkt de UAV-GC 2005 meer vanuit de OG geschreven te zijn, omdat de ON vrij grote verplichtingen heeft. De nieuwe clause zou de balans tussen OG en ON recht kunnen trekken. - De gemaakte Samenwerkingsafspraken (bv in een Project Start Up of Follow Up) hebben <u>wel</u> invloed op het gedrag van de partijen, want de partijen proberen toch in gesprek te blijven met elkaar en proberen elkaars beweegredenen te begrijpen voor bepaalde zaken. Echter, over een aantal onderwerpen wordt er door beide partijen bewust of onbewust minder open gecommuniceerd, bijvoorbeeld in het geval van financiële issues en claims.	
Projectdoelen	
- De gemaakte Samenwerkingsafspraken worden tot nu toe over het algemeen <u>grotendeels</u> nagekomen door beide partijen. - Er is 1x per kwartaal of half jaar een informele PFU met beide partijen waarbij er op de samenwerking wordt gereflecteerd en het nakomen van de afspraken besproken wordt. Daarnaast heb ik met André (PM van ON) maandelijks een informeel overleg over o.a. de samenwerking. Dit komt niet altijd even goed uit de verf vanwege allerlei actualiteiten en discussies. Beide partijen proberen wel de goede lijn erin te houden, maar weten ook dat ze er beide regelmatig onbewust van afwijken vanwege o.a. de actualiteiten, drukte en spanningen.	

▪ ‘Informeel contact’ en ‘1-op-1’ loopt wel goed, maar communicatie vindt nog vaak plaats via de mail i.p.v. elkaar op te zoeken, omdat dit sneller gaat. ▪ ‘Openheid’ is een groot begrip en vormt een belangrijk deel van het totale spel dat gespeeld wordt tussen de OG en de ON. In dit project kan ‘openheid’ iets beter, maar ik ben hier niet heel ontevreden over. De openheid tussen de partijen varieert nogal tijdens het project. Sommige momenten zijn de partijen zeer open tegenover elkaar, en andere momenten juist niet. Bijvoorbeeld in het geval van een potentiële claim gaat de OG niet in alle openheid vertellen over hoe hij erover denkt, anders heeft de OG geen weerwoord meer op de claim van de ON. ▪ ‘Focus op het doel’ door de OG is er wel, maar de ON denkt misschien van niet want sommige processen duren lang waardoor het lijkt alsof de OG niet meewerkt of het hem extra moeilijk maakt. De weg om het doel te bereiken is voor de OG en de ON verschillend, maar hier is niet altijd wederzijds inzicht en begrip voor. Zo is voor de OG o.a. de politieke en publieke (i.e. de omgeving) draagkracht belangrijk. ▪ ‘Tijdigheid’ had o.a. betrekking op het in acht nemen van de acceptatie- en toetsingstermijnen. Deze afspraak wordt door de OG nagekomen, maar de ON vindt dat de besluitvorming altijd te lang duurt. Als de OG documenten van de ON binnen krijgt, kost het gewoon tijd om te reageren omdat de OG deze moet bespreken met de stakeholders (soms wel 3 of 4). De doelen m.b.t. het projectresultaat zijn <u>niet</u> afgestemd tussen OG en ON. Ze zijn <u>wel</u> meegedeeld aan elkaar door het Contractbeheersplan en het Project Management Plan uit te wisselen.
Communicatie ▪ De partijen houden zich op hoofdlijnen aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Deze plannen werken over het algemeen goed. Ik weet <u>niet</u> of er problemen zijn, want ik ben hier <u>niet</u> direct bij betrokken. ▪ Er is informeel contact tussen OG en ON door: Ten eerste, de co-locatie op de Wiardaplantage. Dit was een bewuste keuze om de afstand met de ON klein te houden. Het is dus belangrijk dat mensen die dagelijks met het project bezig zijn er zoveel mogelijk zitten. Ik zit niet fulltime op het project en ben alleen woensdagochtend daar voor een paar overleggen o.a. met de PM van de ON André. Ten tweede, informeel overleg met André (elke maand). Ten derde, de informele PFU's tussen de kernteams van de OG en ON (elk kwartaal of half jaar). Tijdens de PFU's gaan de partijen discussiëren over mogelijke aandachtspunten en worden een aantal aangepakt. Aan het einde is er tevens een etentje en/of een borrel. Dit verbetert de onderlinge verstandhouding en relatie tussen de OG en ON. Ten vierde, de informele PSU waarbij beide partijen de ruimte krijgen om zich aan elkaar te presenteren.
Problemen oplossen ▪ Er is gekozen om de Raad van Deskundigen (RvD) niet in te schakelen voor geschillenbeslechting (Basisovereenkomst art. 18), omdat hierbij hetzelfde gevoel bij de OG overheerst als bij de RvA. Bij geschillen die dermate groot zijn en niet meer binnen het project opgelost kunnen worden, is in Nederland één partij ingesteld die echte objectiviteit en onafhankelijkheid vertegenwoordigt. Dit is de rechter. ▪ De OG heeft ervoor gekozen om de Raad van Arbitrage (RvA) niet in te schakelen voor geschillenbeslechting (volgens Basisovereenkomst art. 18 is par. 47 vervallen). Voor de opdrachtgever is er in Nederland 1 instantie die onafhankelijk is en ingesteld is om geschillen te behandelen, dat is de rechter. Bij OG heerst het gevoel dat de Raad van Arbitrage (RvA) geen gelijk speelveld creëert voor de OG en ON want bij de RvA staat de OG gelijk al 1-0 achter (reden: OG heeft veel tijd genomen om een contract op te stellen, ON moet in zeer korte tijd onder hoge druk een aanbieding doen waarbij hij altijd zaken kan vergeten dan wel zaken zo ver weggestopt zijn in een contract dat het bijna onmogelijk is voor de ON om dit te tijdig te signaleren in de aanbestedingsfase). Het was een gevoelsmatige keuze van de OG (i.e. voornamelijk van Sieds) die gemaakt is op basis van de behandelingen en de uitspraken van de RvA, waarbij de OG meestal aan het kortere eind trekt. Om mogelijke oneerlijke situaties te vermijden, is als beheersmaatregel besloten om alle contracten die onder Sieds vallen via de rechter te laten gaan. De rechter is wel onafhankelijk en in Nederland kan je voor dit soort geschillen naar de rechtbank voor een gelijk speelveld. ▪ Ik weet <u>niet</u> waarom de OG gekozen heeft voor de Voorzieningenrechter, want de keuze komt vanuit Sieds en de Provincie, hier had ik <u>geen</u> invloed op. ▪ Problemen worden zoveel als mogelijk langs minnelijke weg opgelost door: Ten eerste, uitgebreid inhoudelijk overleg. Ten tweede, het escalatiemodel (werkvloer>Edward en André > Sieds en directeur Heijmans). Ten derde, tijdig escaleren. Ten vierde, het directieoverleg dat 1x per half jaar plaats vindt tussen Edward, Sieds, André en directeur Heijmans. Dit vormt het laatste platform om problemen minnelijk op te lossen. Ten vijfde, vroegtijdige waarschuwing. Dit wordt vooral actief gedaan door de OG om de ON te helpen, want de OG vindt dat waarschuwen een verantwoordelijkheid en gewenst gedrag is. Echter, de ON vindt dat de OG te veel waarschuwt en zich te veel met de ON bemoeit volgens het D&B contract. De ON heeft tijdens de PSU en PFU's aangegeven dit dan ook niet te willen. De ON is van mening dat hij in de lead is en weet wat hij moet doen. Een waarschuwing van de OG kan dus leiden tot vreemde situaties. De OG maakt zich dan zorgen om iets en meldt dit aan de ON, maar wordt niet echt gehoord door de ON of de ON bagatelliseert het. Ten zesde, samen problemen op te lossen. Onafhankelijk van de verantwoordelijkheid van het risico gaat de OG in overleg met de ON en denkt de OG actief mee over oplossingsrichtingen o.a. om de ON te wijzen op het totaalbeeld om te voorkomen dat de schade groter wordt. Het is ook mogelijk dat de OG een oplossingsvoorstel aandraagt mits de ON er verantwoordelijk voor blijft. ▪ Tot nu toe zijn alle problemen langs minnelijke weg opgelost. Er zijn <u>wel</u> problemen geëscaleerd. Het moet wel heel raar lopen als geschillen door de rechter beslecht moeten worden, want zelfs hele grote problemen kunnen opgelost worden in het directieoverleg.
Risicoverdeling ▪ De aanvullende risicoverdeling tussen OG en ON is toegevoegd aan de Basisovereenkomst (annex 12) om de risicoverdeling te verduidelijken en risico's af te laten prijzen in de aanbestedingsfase en om de snelheid in het project te houden. De risico's benoemd in de UAV-GC 2005 zijn heel algemeen, hierdoor zijn ze moeilijk af te prijzen door de ON. Dit leidt meestal tot veel vragen tijdens de aanbesteding. Met de risicoverdeling heeft de OG risico's gespecificeerd en gekwantificeerd. Daarnaast heeft de OG een drempel toegevoegd aan enkele risico's (e.g. NGE, archeologische vondst, flora en fauna). De ON draagt het risico tot de drempel en daarna is het risico voor de OG, hierdoor komt het werk niet steeds stil te liggen als het risico optreedt. ▪ Bij het bepalen van de risicodragers wordt er gekeken naar wie het beste in staat is het risico te beheren. Vervolgens wordt het risico al dan niet doorgeschoven naar de andere partij. De OG heeft geprobeerd dit tot een minimum te beperken, want de UAV-

GC 2005 is in principe in balans. In dit project zijn geen expliciete risico's uit de UAV-GC 2005 verlegd, want anders zou dit opgenomen worden Annex 14 'Wijzigingen ten opzichte van de UAV-GC 2005'. ▪ ON vindt het soms raar dat een bepaald risico bij hem ligt, terwijl die normaal gesproken bij de OG ligt. Het gaat dan bijvoorbeeld om de bodemgesteldheid. In dit project liggen zulke risico's alleen in het voortraject (i.e. contractvoorbereidingsfase) bij de OG. Alles wat de OG eraan kon doen, is dan ook gedaan (e.g. heel uitgebreid geotechnisch- en laboratorium onderzoek t.o.v. de norm). Het onderzoek wordt meegestuurd tijdens de aanbesteding en vervolgens is het restrisico voor de ON. De interpretatie van het onderzoek is dus de verantwoordelijkheid van de ON (e.g. afstemmen op materieel en uitvoeringsmethode). ▪ Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. Voor sommige risico's is wel een drempel ingesteld. ▪ De ON wordt beloond voor het dragen van het risico via een risicoreservering in de inschrijfsom. Voor nieuwe risico's is het meestal al duidelijk wie de risicodragers is, want dit hangt af van de oorsprong van de risico's. Nieuwe risico's m.b.t. de politiek, wet- en regelgeving etc. zijn voor de OG, terwijl nieuwe ontwerp- en uitvoeringsrisico's voor de ON zijn.
Continu verbeteren van de relatie ▪ De PSU en de PFU hebben de relatie tussen OG en ON in de basis verbeterd. Tijdens de PFU hebben we elkaar scherp gehouden op de Samenwerkingsafspraken. Iedereen deed serieus mee, want het doel en de relevantie van de meetings werd wel door iedereen erkend. Hierbij wordt regelmatig ook externe begeleiding betrokken zodat iedereen (inclusief projectmanagement) actief kan deelnemen aan de bijeenkomst. ▪ De mogelijke verbeterpunten uit de PFU zijn nog actueel en <u>niet</u> opgelost. Dit zijn terugkerende discussiepunten en de partijen zijn er wel steeds mee bezig. ▪ De meest terugkerende discussie is het afstemmen over de invulling van het D&C contract. Dit punt is besproken tijdens de PFU. Het beeld dat de OG heeft van D&C is anders dan die van de ON. De ON is van mening dat de OG niet een D&C, maar een E&C project op de markt heeft gezet. De OG vindt dat het wel een D&C is, want de OG heeft de ontwerpcomponenten gedefinieerd in het contract en heeft het gehele constructieve ontwerp (oplossingsmethoden) vrijgelaten met in acht name van enkele randvoorwaarden. Het visuele ontwerp (beeldkwaliteit) is wel vastgelegd en het is aan de aannemer hoe hij dit wenst of kan invullen. Beide partijen bleven bij hun standpunt en moesten maar accepteren dat ze er niet uitkomen. Dit punt komt steeds terug in andere discussie, maar kan niet opgelost worden. ▪ De andere punten komen minder vaak terug in andere discussies en zijn minder moeilijk om op te lossen. Bijvoorbeeld, beide partijen hebben belang bij het waarmaken van de belofte richting de omgeving. De OG hecht hier wat zwaarder aan dan de ON, maar krijgt de OG de ON wel mee en de ON krijgt hier ook wel ruimte voor. ▪ Tijdens het project zijn er regelmatige PFU's met of zonder externe begeleiding (elk kwartaal of half jaar), een onderzoekenquête onder de kernteams en bepaalde overlegstructuren afgesproken tussen de OG en ON ten behoeve van het verbeteren van de relatie.
Overige systemen of processen ▪ Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON: de andere partij betrekken in de processen en afwegingen (i.e. inzicht geven in hoe dingen tot stand komen). ▪ Aanvulling op 'Redelijk gedrag': afspraken nakomen en niet opnieuw ter discussie stellen.

3. Antwoorden op de interviewvragen over 'wijzigingen'
Projectdoelen ▪ De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn <u>wel</u> afgestemd betreft de procedures, maar <u>niet</u> betreft het resultaat. Het laatstgenoemde is alleen kenbaar gemaakt aan elkaar. ▪ De doelstellingen van OG en ON m.b.t. risico management zijn <u>niet</u> afgestemd betreft het resultaat. De doelstellingen van de OG die in de Vraagspecificatie Deel 2 staan, zijn van tevoren vastgesteld en kunnen dus niet meer afgestemd worden. Als het in de Vraagspecificatie staat, moet de ON hieraan voldoen. Praktisch gezien is het een algemene doelstelling die wederzijds gedragen wordt. Ik ga ervan uit dat de procedures <u>wel</u> zijn afgestemd.
Risico management ▪ De OG en de ON houden zich in ieder geval op de hoofdlijnen aan de opgestelde risico management plannen tijdens het project. Ik weet <u>niet</u> of er problemen zijn, want ik ben hier <u>niet</u> direct bij betrokken. Er is in ieder geval geen signaal bekend dat het niet goed loopt. ▪ De aanpak van risico's door de OG is grotendeels proactief, want als het gaat om risico's van de ON zit de OG er actief achteraan om informatie los te krijgen van de ON (e.g. vragen hoe de ON het ziet en gaat aanpakken). ▪ De aanpak van risico's door de ON is grotendeels reactief, want de ON is heel terughoudend met informatieverstrekking om gezeur van de OG te vermijden. ▪ Risico management speelt <u>niet</u> expliciet een rol in de VTW-procedure, maar een VTW kan gevolgen hebben voor de risico's (e.g. risicodossier, verantwoordelijkheden) en beheersmaatregelen van risico's kunnen bestaan uit contractwijzigingen.
Wijzigingsprocedure ▪ De gebruikte VTW-procedure wijkt af van de wijzigingsprocedure uit de UAV-GC 2005 (par. 14, 15 en 45) vanwege diverse redenen (zie hieronder). ▪ De OG wil gelijk een raming zien om te bepalen of de wijzigingen doorgezet moet worden of niet. Als het bedrag veel hoger is dan verwacht, kan de OG nog in gesprek gaan met de ON hierover. Als de partijen er vervolgens niet uitkomen, kan de OG op zoek gaan naar een andere aannemer (dit wordt echter lastig omdat het in het werkgebied van de ON is) of kan de OG in gesprek gaan met de stakeholders over de VTW. ▪ De toets of de ON verplicht is de wijziging uit te voeren vindt <u>niet</u> expliciet plaats. Als de ON een VTW weigert die gaat buiten zijn werk en werkgebied valt, dan lost de OG het gewoon anders op. In de basis gaat de OG ervan uit dat als een VTW binnen de ON's werk en werkgebied valt, de ON de VTW zal uitvoeren. ▪ De automatische acceptatieregeling is theoretisch nog <u>wel</u> van toepassing, maar wordt door beide partijen niet actief en bewust gebruikt. De communicatie over VTW's vindt namelijk niet zo formeel d.m.v. brievenuitwisseling plaats als in het UAV-GC 2005 voorgeschreven is, wel wordt e.e.a. schriftelijk vastgelegd of bevestigd. Daarnaast proberen de partijen in gesprek te blijven over VTW's en enige voortgang in dit proces te houden.

- Par. 14 lid 16 is geschrapt (i.e. wijziging vervalt niet als er geen prijsovereenkomst is), want de OG initieert <u>geen</u> optionele VTW's, maar alleen noodzakelijke om bijvoorbeeld een risico te beperken of het nakomen van een afspraak te borgen. - Par. 14 lid 17 is geschrapt (i.e. geen kostenvergoeding/termijnverlenging voor ON bij vertraging in procedure), omdat VTW's soms lang blijven liggen voordat ze afgehandeld zijn. Dit komt o.a. door de actualiteiten en de drukke agenda's van de mensen. - Alle andere sub clausules van par. 14, 15 en 45 uit de UAV-GC 2005 die niet zijn vervallen, zijn wel van toepassing en worden indien nodig gebruikt bij de algehele beoordeling van de VTW. - De OG en de ON houden zich op hoofdlijnen wel aan de opgestelde VTW-procedure tijdens het project, maar vooral qua doorlooptijden kan het efficiënter. - De aanvulling met de extra controle- en waarschuwingsplicht voor de ON in de Basisovereenkomst (annex14) is toegevoegd, omdat de OG <u>niet</u> wil dat de ON alleen waarschuwt voor fouten waar hij tegenaan loopt, maar dat de ON een proactievare houding aanneemt in het onderzoek om te kunnen waarschuwen. Het hoofddoel van de aanvulling is om fouten en onduidelijkheden vroeg op tafel te krijgen. - Het is moeilijk om de reikwijdte van de waarschuwingsplicht in te schatten. De OG kan terugvallen op de aanvulling als de ON <u>niet</u> heeft gewaarschuwd en dit gebruiken als argument tijdens onderhandelingen. Het doel is dan <u>niet</u> om bijvoorbeeld de VTW vanuit de ON af te wijzen of niet te betalen, want hiervoor zal het argument <u>niet</u> zwaar genoeg zijn. Het argument kan <u>wel</u> gebruikt worden om het grijze gebied in te kaderen tijdens de onderhandelingen. - Het is <u>niet altijd</u> mogelijk om te beroepen op de waarschuwingsplicht, want het bewijzen dat de ON had moeten waarschuwen blijft moeilijk. Volgens deze aanvulling moet de ON alle documenten van de OG controleren op fouten. De ON heeft de documenten tijdens de aanbesteding ontvangen, waar tevens een waarschuwingsplicht gold in het geval van vragen en onduidelijkheden. Toen konden er vragen gesteld worden. Na de gunning had de ON de gelegenheid om de documenten nog eens te bestuderen en eventueel te waarschuwen. In de loop van het project krijgt de ON steeds meer inzicht in de documenten van de OG. De OG verwacht dat dit proces lopend scherp gehouden wordt door de ON, maar er zijn geen afspraken gemaakt tussen de OG en ON over de invulling van de extra plichten. Rechters en arbiters vullen de waarschuwingsplicht in door vooral te kijken naar het proces en de momenten waar de ON had kunnen waarschuwen. - De ON voldoet <u>onvoldoende</u> aan de extra controle- en waarschuwingsplicht tijdens het project. - In dit project is er een discussie over de waarschuwingsplicht van de OG. De OG vindt dat hij ook de verantwoordelijkheid te waarschuwing richting de ON en uit de UAV-GC 2005 kan ook afgeleid worden dat de waarschuwingsplicht wederzijds is. Volgens de ON staat deze verantwoordelijkheid <u>niet</u> in het UAV-GC 2005. - De aanpak van wijzigingen door de OG is half reactief/half proactief. De OG is snel met het indienen van VTW's vanuit de OG, maar als de ON bezig is met de uitvoering en de ON wil iets daarin wijzigen, dan kan het soms veel langer duren. - De aanpak van wijzigingen door de ON is grotendeels reactief. De ON is te langzaam of te laks met het indienen van VTW's vanuit de ON. De algemene indruk van de ON is dat hij helemaal geen VTW's wil. - De extra controle- en waarschuwingsplicht en de standaard waarschuwingsplicht spelen <u>geen</u> rol in de aanpak van wijzigingen. De waarschuwingsplicht wordt door beide partijen <u>niet</u> gebruikt om van tevoren wijzigingen aan zien te komen, maar wordt wel gebruikt voor risico's. Een waarschuwing van de OG of de ON voor een risico kan leiden tot een contractwijziging. - De extra controle- en waarschuwingsplicht en de standaard waarschuwingsplicht spelen <u>geen</u> rol in de VTW-procedure, maar ze kunnen wel mogelijk als argument gebruikt worden om het grijze gebied in te kaderen tijdens de onderhandelingen. - De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:	
9. Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10. Het wijzigingsvoorstel opnemen in een logboek	X
11. De prioriteit van de wijziging bepalen	X
12. Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	-
13. De impacts van de verschillende wijzigingsopties bepalen	-
14. (Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15. Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16. Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	X
5. De uitvoering van de wijziging monitoren en documenteren.	X
Opmerkingen: Bij 12, dit gebeurt alleen met de Gemeente Leeuwarden, de Provincie en het Wetterskip Fryslân. Bij 14, de snelheid van besluitvorming hangt af van de prioriteit van de wijziging, de volledigheid van de informatie en de gevolgen voor de andere onderdelen (totaaloverzicht van impact).	
Continu verbeteren	
- Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Dit gebeurt alleen impliciet, de dingen die je leert tijdens een project, neem je mee naar andere projecten. Als het toegevoegde waarde heeft, wordt de kennis gedeeld tussen OG en ON, maar dit is in dit project niet gebeurd. - De performance van de risico management processen van de ON wordt tijdens het project <u>niet</u> gemeten en bijgestuurd.	
Overige systemen of processen	
- Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingenproces. - Aanvulling op 'Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren': overzicht en volledigheid (i.e. beoordelen impact) is erg belangrijk.	

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)	
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):	
C	1. Veel communicatie en interacties
	2. Samen problemen oplossen
	3. Redelijk gedrag
C	4. Gedeelde projectdoelen
	5. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
C	6. Andere partij betrekken in de processen
	7. Problemen oplossen op het eerste niveau
	8. Emotionele investeringen
C	9. Duidelijk communicatiesysteem
C	10. Eerlijke/proportionele risicoverdeling
C	11. Systeem voor continu verbeteren van de relatie
	12. Betrouwbaarheid: cultuur, beleid
C	13. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):	
C	1. Vroegtijdige waarschuwingsplicht
C	2. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
	3. Adequate documentatie van de wijziging
C	4. Eerlijke/proportionele risicoverdeling
	5. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
C	6. Risico management systeem
C	7. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
	8. Leren van wijzigingen en kennis hiervan delen
Invloed vertrouwen op wijzigingenproces	
- De efficiëntie van het wijzigingenproces worden voor <u>45%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er geen of weinig vertrouwen is, moeten beide partijen meer middelen (tijd, geld etc.) inzetten. De ON moet dan zoeken naar aanvullende onderbouwingen, terwijl de OG probeert grip op de zaken te krijgen. - De effectiviteit van het wijzigingenproces worden voor <u>15%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er geen of weinig vertrouwen is, dan gaat de OG meer twijfelen of het wel een terechte VTW is. Als de OG bestookt wordt met twijfelachtige VTW's, dan is de OG steeds minder geneigd een VTW in behandeling te nemen.	

INTERVIEW VERSLAG #3E

Interview:	Project Drachtsterweg t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	07-10-2014
Tijd:	11.00 – 13.00u
Locatie:	Kantoor Vrij-Baan Leeuwarden (Snelliusweg 11)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	05-01-2015
Gevalideerd (DD/MM/JJJJ):	19-01-2015 (automatisch)

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
TM	Thedo Mienstra	Assistent projectleider	technisch Provincie Fryslân	-

2. Antwoorden op de interviewvragen over ‘vertrouwen’	
Betrouwbaarheid bij aanbesteding	
Ik was <u>niet</u> betrokken bij de aanbesteding.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW heeft <u>geen</u> invloed op het gedrag van de partijen. Dit zou wel moeten, maar gebeurt niet altijd. Bovendien zijn redelijkheid en billijkheid meer algemene principes voor hoe de mensen met elkaar omgaan in dit project. - De OG is doorgaans wel redelijk en billijk, maar is wat terughoudend naar de ON omdat de ON slechts één belang lijkt te hebben: ‘geld verdienen’. Over het algemeen, als de ene partij redelijk en billijk is, zal de andere zich ook zo gedragen. De partijen zullen dan ‘geven en nemen’. - De gemaakte Samenwerkingsafspraken hebben <u>wel</u> invloed op het gedrag van de partijen. Dit is de bedoeling, maar de afspraken worden tot nu toe <u>half</u> nagekomen.	
Projectdoelen	
- De gemaakte Samenwerkingsafspraken worden tot nu toe <u>half</u> nagekomen door beide partijen. - Tijdens 1-op-1 overleggen (i.e. informeel contact) met de uitvoerders van de ON is er <u>wel</u> openheid, maar in grote overleggen met anderen erbij is dit veel minder. Dit komt door o.a. door de planningsproblemen in het project. - De focus op het doel verschilt voor de OG en ON. Het doel is ‘een kwalitatief goed product realiseren binnen tijd en geld’, maar de OG focust vooral op de kwaliteit terwijl de ON op de financiën focust. Dit botst weleens tijdens het project. - De afspraak ‘tijdigheid’ wordt <u>niet</u> nagekomen. De ON wacht vaak te lang met een probleem kenbaar en bespreekbaar te maken, hierdoor ontstaan er rug-tegen-de-muur situaties en is de OG genoodzaakt om in te stemmen met het voorstel van de ON. - Ik weet <u>niet</u> of de doelen m.b.t. het projectresultaat zijn afgestemd tussen OG en ON. Ik was <u>niet</u> betrokken bij de contractvoorbereiding.	
Communicatie	
- De partijen houden zich aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Deze plannen werken wel goed. - Er is informeel contact tussen OG en ON door elkaar op te zoeken en dingen mondeling te bespreken. Daarna worden dingen pas vastgelegd via de mail of formeel overleg.	
Problemen oplossen	
- Ik weet <u>niet</u> waarom ervoor gekozen is om de Raad van Deskundigen (RvD) niet in te schakelen voor geschillenbeslechting (Basisovereenkomst art. 18). Ik was <u>niet</u> betrokken bij de contractvoorbereiding. - Ik weet <u>niet</u> waarom er gekozen is voor de Voorzieningenrechter. Ik was <u>niet</u> betrokken bij de contractvoorbereiding. - Problemen worden langs minnelijke weg opgelost door: apart VTW-overleg en een escalatiemodel. - Problemen worden meestal door de ON vastgelegd in een VTW. Diegene die de contractwijziging initieert, komt met het voorstel. Vaak is dit de ON, maar soms is het de OG. Vervolgens wordt de VTW besproken tijdens het VTW-overleg. Als het een reële VTW en onderbouwing is, zullen de partijen snel tot een overeenkomst komen. Als de partijen het niet eens zijn over de contractwijziging of de prijs, proberen ze elkaar te overtuigen met argumenten. Het contract wordt erbij gepakt om te bepalen of het een contractwijziging is of niet. Als de partijen er na lange tijd nog niet uitkomen, wordt het probleem geëscaleerd om ruzies en ergernissen te voorkomen en de relatie goed te houden omdat de partijen nog vrij lang met elkaar moeten werken. - Tot nu toe zijn alle problemen langs minnelijke weg opgelost.	
Risicoverdeling	
- De aanvullende risicoverdeling tussen OG en ON is toegevoegd aan de Basisovereenkomst (annex 12) om de risicoverdeling af te stemmen op de uitvoeringsmethode van de ON. Toen deze risicoverdeling werd opgesteld, was de uitvoeringsmethode van de ON nog <u>niet</u> bekend, maar er hangen hoe dan ook risico's aan vast. - Bij het bepalen van de risicodragers worden risico's toebedeeld aan de partij die het beste in staat is deze te beheersen. - Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. - De ON wordt beloofd voor het dragen van het risico via een risicoreservering in de inschrijfsom. De OG heeft de risicoverdeling opgesteld en het is aan de ON om te bepalen welke risico's afgeprijsd worden. Bovendien staan er bonussen en boetes voor de ON in het contract met betrekking tot de risico's (Basisovereenkomst art. 16 en Annex 2). Bijvoorbeeld voor de stremmingen en afsluitingen van de vaarweg. Dit is een risico omdat het de OG geld zal kosten want de bedrijven worden dan onbereikbaar en de schepen moeten dan omvaren.	
Continu verbeteren van de relatie	
- De PSU en de PFU hebben de relatie tussen OG en ON <u>niet</u> verbeterd, maar ook <u>niet</u> verslechterd. Het team van de OG deed in ieder geval serieus mee, het is moeilijk om te zeggen of het team van de ON dat ook deed. - De mogelijke verbeterpunten uit de PFU zijn <u>niet</u> aangepakt na de meeting.	

Tijdens het project zijn er PFU's tussen OG en ON ten behoeve van het verbeteren van de relatie. Tot nu toe hebben de PFU's nog toegevoegde waarde. De partijen zijn nog <u>niet</u> op het punt beland dat de standpunten van de OG en de ON te ver uit elkaar liggen.
Overige systemen of processen
- Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON. - Aanvulling op 'Systeem voor continu verbeteren van de relatie', 'Veel communicatie en interacties' en 'Emotionele investeringen': dit zijn herstelmaatregelen voor de relatie.

3. Antwoorden op de interviewvragen over 'wijzigingen'	
Projectdoelen	
- De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn afgestemd betreft de procedures, maar <u>niet</u> betreft het resultaat. Het heeft <u>geen</u> zin om een maximum hoeveelheid VTW's vast te leggen, want de ON is vrij om een VTW in te dienen als hij denkt dat het een contractwijziging is. - De doelstellingen van OG en ON m.b.t. risico management zijn afgestemd betreft de procedures, maar ik weet <u>niet</u> of ze ook zijn afgestemd betreft het resultaat. Dit zal de risico manager Rob Tomasouw weten.	
Risico management	
- De OG en de ON houden zich over het algemeen aan de opgestelde risico management plannen tijdens het project. De partijen hebben wel discussies over of iets wel of niet als een risico beschouwd moet worden en over de impact van de risico's (groot of klein). - De aanpak van risico's door OG en ON is grotendeels proactief. Als de OG uitvoeringsrisico's ziet, kan hij er zelf niet veel aan doen want hij kan alleen de ON ervoor waarschuwen. De OG moet de ON nog vaak waarschuwen voor dergelijke risico's.	
Wijzigingsprocedure	
- Ik weet <u>niet</u> of de gebruikte VTW-procedure afwijkt van de wijzigingsprocedure uit de UAV-GC 2005 (par. 14, 15 en 45). Ik was <u>niet</u> betrokken bij de contractvoorbereiding. - Alle andere sub clausules van par. 14, 15 en 45 uit de UAV-GC 2005 die niet zijn vervallen, zijn wel van toepassing. Op het VTW-formulier moet aangegeven worden op welk document en eis, paragraaf, artikel etc. de wijziging van toepassing is. Als er onduidelijkheden zijn op het formulier, wordt het contract erbij gepakt. - De OG en de ON houden zich aan de opgestelde VTW-procedure tijdens het project. Tot nu toe werkt het goed, maar de afhandeling van de VTW kan soms lang duren. Na het indienen van de VTW reageert de OG erop, dan geeft de ON een tegenreactie en zo blijf je dan lang in discussie omdat de partijen het niet met elkaar eens zijn. Als de partijen er na lange tijd nog niet uitkomen, kan de VTW geëscaleerd worden. Dit gaat meestal met meerdere VTW's tegelijk. Op het hogere niveau maken de partijen dan meestal een 'packaged deal' waarbij de OG de VTW's voor een bepaald bedrag afkoopt. - Ik weet <u>niet</u> waarom de aanvulling met de extra controle- en waarschuwingsplicht voor de ON in de Basisovereenkomst (annex14) is toegevoegd. Ik was <u>niet</u> betrokken bij de contractvoorbereiding. - De aanpak van wijzigingen door de OG en de ON is grotendeels proactief. Beide partijen pakken contractwijzigingen proactief op, want ze kunnen er niet om heen. De OG zorgt ervoor dat er zo snel mogelijk een goed onderbouwd antwoord komt op de VTW. - De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:	
9. Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10. Het wijzigingsvoorstel opnemen in een logboek	X
11. De prioriteit van de wijziging bepalen	X
12. Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	X
13. De impacts van de verschillende wijzigingsopties bepalen	X
14. (Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15. Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16. Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	X
5. De uitvoering van de wijziging monitoren en documenteren.	X
Opmerkingen: Bij 14, de snelheid van besluitvorming hangt af van of de VTW reëel is. Bij, 16, dit gebeurt in een digitaal archief door het Contractbeheerteam van de OG, maar het is niet zo dat iedereen dan gelijk een mail erover krijgt.	
Continu verbeteren	
- Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Dit gebeurt alleen intern bij de OG, want de OG is bezig met meerdere projecten. Dingen die fout zijn gegaan in het project of niet goed zijn opgenomen in het contract, probeert de OG goed te doen in andere contracten. De gedeelde kennis betreft ook contractwijzigingen. Bijvoorbeeld, een bepaalde eis kan anders geformuleerd worden om een VTW te voorkomen. Het delen van kennis is geen standaard proces, maar de project teams van de OG attenderen elkaar op dingen als ze zien dat de met hetzelfde te maken hebben. - De performance van de risico management processen worden tijdens het project gemeten en bijgestuurd.	
Overige systemen of processen	
Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingsproces.	

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)	
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):	
C	1. Redelijk gedrag 2. Samen problemen oplossen 3. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch) 4. Duidelijk communicatiesysteem 5. Problemen oplossen op het eerste niveau 6. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch) 7. Gedeelde projectdoelen
C	8. Eerlijke/proportionele risicoverdeling 9. Betrouwbaarheid: cultuur, beleid 10. Systeem voor continu verbeteren van de relatie 11. Veel communicatie en interacties 12. Emotionele investeringen
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):	
C	1. Leren van wijzigingen en kennis hiervan delen
C	2. Vroegtijdige waarschuwingsplicht
C	3. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
C	4. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
C	5. Adequate documentatie van de wijziging
C	6. Risico management systeem
C	7. Eerlijke/proportionele risicoverdeling
	8. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
Invloed vertrouwen op wijzigingenproces	
	- De efficiëntie van het wijzigingenproces worden voor <u>75%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er geen of weinig vertrouwen is, moeten er meer middelen (tijd, geld etc.) worden ingezet voor controle van een wijziging en impact. Als er wel vertrouwen is, zal de OG eerder geloven dat het waar is wat de ON voorstelt en dat de ON hem oplicht. - De effectiviteit van het wijzigingenproces worden voor <u>0%</u> bepaald door het vertrouwensniveau tussen OG en ON. Een wijziging wordt doorgevoerd volgens de wijzigingsprocedure, hier is geen vertrouwen voor nodig.

INTERVIEW VERSLAG #4P

Interview:	Project Drachtsterweg t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	26-09-2014
Tijd:	14.00 – 16.00u
Locatie:	Kantoor RHDHV Steenwijk (Stationsplein 10)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	05-01-2015
Gevalideerd (DD/MM/JJJJ):	14-01-2015

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
JK	Jörgen Kleinheerenbrink	Contractbeheerder/ Technisch Projectleider	RHDHV/Provincie Fryslân	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
- De uitsluitingsgronden en de minimumeisen waren voldoende om te bepalen hoe betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) de aannemers waren om het werk uit te voeren. De minimumeisen waren bewust opgesteld om vooral grotere aannemers aan te trekken en waren bedoeld om de technische bekwaamheid en de capaciteit (financiën en personeel) van de aannemers te toetsen. - Er waren <u>geen</u> andere factoren van invloed op de voorselectie van aannemers. - Op persoonlijk niveau zijn er tijdens de aanbesteding <u>geen</u> eisen gesteld aan de werknemers van de ON. Er zijn <u>geen</u> interviews gehouden en <u>geen</u> CV's gevraagd. Je kan het wel eisen, maar dan bestaat de kans nog steeds dat het uitvoeringsteam verandert tijdens het project. Bij Best Value Procurement (BVP) is dit aspect wel belangrijk. - Elke aannemer had gekozen voor het hoogste CO2-bewust Certificaat-niveau, waardoor de korting op de inschrijvingsprijs voor iedere aannemer hetzelfde was en het alsnog een laagste-prijs aanbesteding werd. - Het calculatie-ontwerp met uitleg over bouwmethode van de aannemers maakte <u>geen</u> deel uit van de gunningscriteria, maar werd besproken tijdens individuele informatie-uitwisselingsrondes. - Deze uitwisselingsrondes waren bedoeld om eventuele missers in het contract te corrigeren en om te kijken of de aannemers op de goede weg zitten en eventueel te waarschuwen als ze de specificaties verkeerd hadden geïnterpreteerd. - Deze uitwisselingsrondes hadden invloed op het vertrouwensniveau tussen de OG en de ON. Sommige aannemers waren open of half open tijdens het bespreken van het PvA, terwijl anderen juist gesloten waren. Heijmans, de aannemer die het uiteindelijk is geworden, was de meest gesloten en achterdochtige aannemer. De eerste paar maanden van het project had de OG wel moeite met deze slechte eerste indruk van de ON.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW heeft over het algemeen <u>wel</u> invloed op het gedrag van de partijen, als het om meer geld gaat, worden deze principes belangrijker. Bijvoorbeeld met wijzigingen wordt er eerst naar het contract gekeken om te bepalen wie recht heeft op wat. Vervolgens speelt redelijkheid en billijkheid een rol om tot een overeenkomst te komen. - De gemaakte Samenwerkingsafspraken hebben <u>wel</u> invloed op het gedrag van de partijen. Bijvoorbeeld, wijzigingen worden zoals afgesproken tijdig gesignaleerd en niet pas maanden later.	
Projectdoelen	
- De gemaakte Samenwerkingsafspraken worden tot nu toe nagekomen door beide partijen. Over het algemeen wordt er wel iets mee gedaan. Zo is er regelmatig informeel overleg tussen Edward, Jörgen en André en tussen Sieds en de directeur van Heijmans. Tevens wordt er elk half jaar een PFU georganiseerd. Openheid is niet echt meetbaar. Tijdigheid en focus op het doel worden nagekomen. - De doelen m.b.t. het projectresultaat staan in het contract (o.a. scope, kwaliteit en randvoorwaarden) of worden in het technisch overleg besproken als er onduidelijkheden zijn. Er is één hoofddoel waar beide partijen naar toe werken, dat is het project goed en op tijd opleveren. De eigen doelen van OG en ON zijn besproken tijdens de PSU, deze staan wel haaks op elkaar. De OG wil zo weinig mogelijk last voor de omgeving en een goede kwaliteit, terwijl de ON het zo goedkoop mogelijk wil bouwen.	
Communicatie	
- De partijen houden zich aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Deze plannen en het DMS werken goed, er zijn maar een paar kleine problemen. Bijvoorbeeld, de toetsen van de OG communiceert soms direct met de uitvoerder of zijn medewerkers, terwijl dit eerst intern met de projectleider moet. Hierdoor is de communicatie niet altijd effectief. Bovendien gaat soms veel via de mail in plaats van de telefoon. Dit is goed om dingen vast te leggen, maar de boodschap komt dan vaak harder aan. - Er is veel informeel contact tussen OG en ON via informele meetings waarvan geen verslag wordt gemaakt. Zo is er de wekelijkse stand van de ON, een afstemoverleg met alle relevante partijen om de bouwduur te verkorten. Een deel van het aquaduct kan alleen in de winter gebouwd worden in verband met het vaarseizoen. Doordat een andere activiteit op het kritieke pad langer duurde dan verwacht, is deze deadline niet gehaald. Hierdoor heeft de ON 5 maanden vertraging opgelopen. Met dit overleg proberen OG en ON samen dit probleem op te lossen omdat de vertraging voor beide partijen hoge kosten met zich meebrengt.	
Problemen oplossen	
- Er is gekozen om de Raad van Deskundigen (RvD) niet in te schakelen voor geschillenbeslechting (Basisovereenkomst art. 18), omdat dit volgens algemeen beleid is van de OG. De OG heeft <u>geen</u> goede ervaring met de Raad van Deskundigen. De uitkomst van deze raad is vaak een advies waar beide partijen geen duidelijkheid mee krijgen (geen harde uitspraak) - Er is gekozen om de Raad van Arbitrage (RvA) niet in te schakelen voor geschillenbeslechting (volgens Basisovereenkomst art. 18 is par. 47 vervallen), omdat dit volgens algemeen beleid is van de OG. De OG heeft <u>geen</u> goede ervaring met de RvA. De RvA kijkt te inhoudelijk naar zaken in plaats van juridisch. - Ik weet <u>niet</u> waarom er gekozen is voor de Voorzieningenrechter. Dit zullen Edward en Sieds weten.	

- Problemen worden langs minnelijke weg opgelost door: apart VTW-overleg (wijzigingen inhoudelijk bespreken), een escalatiemodel (eerste niveau > Edward en André > Sieds en directeur van Heijmans) en samen te werken om problemen op te lossen (want de schade van een risico ligt nooit geheel bij de OG of de ON. De partijen kunnen bijvoorbeeld afzonderlijk verschillende aspecten van een probleem onderzoeken. De OG heeft bovendien ook technische adviseurs). - Tot nu toe zijn alle problemen langs minnelijke weg opgelost. Over het algemeen komen claims pas aan het einde van het project, want dan kan de ON een exactere berekening maken van zijn werkelijke kosten. Een claim van de ON door de opgelopen 5 maanden vertraging is wel mogelijk, maar is nog niet ingediend. Dit zal dan een claim zijn van meer dan één miljoen euro. De vertraging is veroorzaakt doordat bij het ontgraven van de bouwkuip en het aanbrengen van trekpalen voor het aquaduct de bodem harder was dan verwacht. De hardere bodem kon volgens de ON niet opgemaakt worden uit het grondonderzoek van de OG.
Risicoverdeling - De aanvullende risicoverdeling tussen OG en ON is toegevoegd aan de Basisovereenkomst (annex 12) om de risicoverdeling aan te scherpen en te wijzigingen t.o.v. de UAV-GC 2005. Zo is er een drempel toegevoegd aan enkele risico's (e.g. archeologische vondst, flora en fauna) vanwege efficiëntie. De ON draagt het risico tot de drempel en daarna is het risico voor de OG, hierdoor komt het werk niet stil te liggen als het risico optreedt. Daarnaast zijn risico's betrefte de bodemaspecten doorgeschoven naar de ON. - Bij het bepalen van de risicodragers worden zoveel mogelijk risico's doorgeschoven naar de ON, maar hierbij wordt wel gekeken of de ON de risico's kan beïnvloeden en beheren. - Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. Soms worden risico's wel samen opgelost. Het risicodossier wordt regelmatig upgedate tijdens overleggen tussen OG en ON. Als bijvoorbeeld blijkt dat de ON een hoog risico heeft, dan wordt er samen gekeken hoe deze aangepakt kan worden. - Op basis van risicoverdeling in het contract dient ON in zijn inschrijfsom deze risico's mee te nemen. In welke mate de ON dit doet, is aan de ON zelf en is vaak afhankelijk van zijn concurrentiepositie in de aanbestedingsfase. De grootte van de risicoreservering is echter niet duidelijk, want de raming die de ON toont kan anders zijn dan de raming die de ON intern gebruikt.
Continu verbeteren van de relatie - De PSU en de PFU hebben de relatie tussen OG en ON verbeterd. Iedereen deed serieus mee. Je leert elkaar beter kennen en daarnaast worden aandachtspunten besproken. Naast deze twee meetings zijn er ook nog 2 andere PFU's geweest zonder begeleiding van Motion Consult. - De mogelijke verbeterpunten uit de PFU zijn alleen tijdens de PFU besproken (en opgelost). De grootste waren de marge tussen ontwerp en uitvoering houden en het afstemmen over de invulling van het D&C contract. Zowel het ontwerpteam als uitvoeringsteam waren aanwezig tijdens de PFU. - Tijdens het project zijn er regelmatig informele meetings en PFU's (1x per 3 maanden) tussen OG en ON ten behoeve van het verbeteren van de relatie.
Overige systemen of processen Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON.

3. Antwoorden op de interviewvragen over 'wijzigingen'

Projectdoelen	
- De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn alleen afgestemd betrefte de procedures, <u>niet</u> betrefte het resultaat. Het doel van de OG om scopewijzigingen en meerwerk te minimaliseren is <u>niet</u> besproken met de ON. - De doelstellingen van OG en ON m.b.t. risico management zijn alleen afgestemd betrefte de procedures, <u>niet</u> betrefte het resultaat. De doelstellingen die in de Vraagspecificatie Deel 2 staan, zijn namelijk eisen waaraan de ON moet voldoen.	
Risico management	
- De OG en de ON houden zich over het algemeen aan de opgestelde risico management plannen tijdens het project. Deze plannen werken goed. De analyse van risico's door de ON is echter vaak niet volledig, waardoor de OG hier vaak om moet vragen. Dit komt doordat de OG en ON van mening verschillen over de invulling van risicoanalyse. - Voor alle risico's zijn er beheersmaatregelen. Vooral de top 20 grootste risico's worden proactief aangepakt door ze constant te monitoren.	
Wijzigingsprocedure	
- De gebruikte VTW-procedure wijkt af van de wijzigingsprocedure uit de UAV-GC 2005 (par. 14, 15 en 45) omdat de OG eerst wil weten wat de consequenties van de wijziging zijn vóórdat hij ermee akkoord gaat. Als de consequenties niet aangegeven zijn op het VTW-formulier, dan wordt de VTW afgewezen. Bovendien zijn de processen versimpeld en minder formeel ten opzichte van de UAV-GC 2005. - De Provincie heeft er zelf voor gekozen om enkele paragrafen te schrappen uit de UAV-GC 2005. Alle andere sub clausules van par. 14, 15 en 45 uit de UAV-GC 2005 zijn wel van toepassing, maar de UAV-GC 2005 wordt alleen gebruikt om de type wijzigingen te bepalen. - De aanvulling met de extra controle- en waarschuwingsplicht voor de ON in de Basisovereenkomst (annex14) is opgesteld door de Provincie. Waarschijnlijk wil de OG hiermee extra zekerheid creëren. Bewijzen dat de ON fouten heeft gezien en had moeten waarschuwen blijft lastig. Edward zal wel weten wat de exacte reden is voor de aanvulling. - De aanpak van wijzigingen door de OG en de ON is half reactief/half proactief. Soms is de aanpak reactief, omdat het beter is om dingen niet te vroeg te zeggen. De strategie van de OG en ON speelt dus een rol. Voor andere dingen is het beter om het zo vroeg mogelijk te zeggen, dan is de aanpak wel proactief. Vanuit de OG komen weinig wijzigingen, alleen de gemeente wil weleens wat wijzigen. De OG toetst veel documenten en ziet hierdoor wijzigingen eerder aan komen. - De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:	
9. Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10. Het wijzigingsvoorstel opnemen in een logboek	X
11. De prioriteit van de wijziging bepalen	X
12. Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	-
13. De impacts van de verschillende wijzigingsopties bepalen	-

14.	(Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15.	Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16.	Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	-
5.	De uitvoering van de wijziging monitoren en documenteren.	X
Opmerkingen: Bij 11, dit wordt onbewust gedaan. Bij 12, het gaat meestal om wijzigingen waarvoor geen andere varianten nodig zijn. Bij 14, een besluit wordt zo snel mogelijk genomen. De bevoegdheid hangt af van de financiële impact van de wijziging. Bij 16, alleen de acceptatie wordt gedocumenteerd, alle beslissingen eromheen niet. Voor grote wijzigingen wordt er wel een dossier bijgehouden.		
Continu verbeteren		
- Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Dit gebeurt onbewust. Er worden wel lessons learned gecreëerd voor afwijkingen. - De performance van de risico management processen worden tijdens het project <u>niet</u> gemeten en bijgestuurd.		
Overige systemen of processen		
- Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingsproces. - Aanvulling op 'Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin': het escalatiemodel		

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)		
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):		
C	1. Redelijk gedrag	
C	2. Samen problemen oplossen	
C	3. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)	
C	4. Veel communicatie en interacties	
C	5. Problemen oplossen op het eerste niveau	
C	6. Emotionele investeringen	
C	7. Systeem voor continu verbeteren van de relatie	
C	8. Gedeelde projectdoelen	
C	9. Betrouwbaarheid: cultuur, beleid	
C	10. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)	
C	11. Eerlijke/proportionele risicoverdeling	
C	12. Duidelijk communicatiesysteem	
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingsproces (C = in contract opnemen):		
C	1. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin	
C	2. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren	
C	3. Vroegtijdige waarschuwingsplicht	
C	4. Adequate documentatie van de wijziging	
C	5. Eerlijke/proportionele risicoverdeling	
C	6. Leren van wijzigingen en kennis hiervan delen	
C	7. Gedeelde projectdoelen voor wijzigingenbeheer en risico management	
C	8. Risico management systeem	
Invloed vertrouwen op wijzigingsproces		
- De efficiëntie en de effectiviteit van het wijzigingsproces worden voor <u>33%</u> bepaald door het vertrouwensniveau tussen OG en ON. Aan de ene kant, als er geen of weinig vertrouwen is, zal het proces langer duren omdat de OG alles moet controleren (o.a. of de ON er recht op heeft en of de prijsvorming correct is). Aan de andere kant, voor een groot deel gaat het om zakelijkheid, waarvoor geen vertrouwen nodig is. De ON heeft als doel om winst te maken. Geld kan verdiend worden met wijzigingen. Daarom zullen er altijd wijzigingen zijn. - Vertrouwen heeft meer invloed op de efficiëntie dan op de effectiviteit van het wijzigingsproces.		

INTERVIEW VERSLAG #5P

Interview:	Project Drachtsterweg t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	09-10-2014
Tijd:	13.00 – 15.00u
Locatie:	Leeuwarden (Wiardaplantage 19)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	05-01-2015
Gevalideerd (DD/MM/JJJJ):	16-01-2015

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
MF	Michael Freerks	Procescoördinator	RHDHV	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
Ik was <u>niet</u> betrokken bij de aanbesteding, want deze vond plaats vóórdat RH en DHV fuseerden. Ik werkte voor DHV.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW heeft <u>geen</u> invloed op het gedrag van de partijen. Dit zijn meer algemene principes van de mensen zelf. Het kan soms redelijker en billijker in dit project. Beide partijen houden zich lang vast aan bepaalde standpunten. Uiteindelijk worden deze wel bijgedraaid, maar dit kan wel iets eerder. - De gemaakte Samenwerkingsafspraken hebben <u>geen</u> invloed op het gedrag van de partijen. Bepaalde dingen zijn wel benoemd tijdens de PFU, maar we spreken elkaar er niet op aan als afspraken niet nagekomen worden. Het zijn vrij standaard afspraken die niet echt een leidraad vormen voor de samenwerking en gebruikt kunnen worden tijdens overleggen.	
Projectdoelen	
- De gemaakte Samenwerkingsafspraken worden tot nu toe over het algemeen nagekomen door beide partijen, maar er zijn enkele problemen waardoor sommige processen langer duren. - De formele en informele overlegstructuren werken goed en worden gevolgd. 'Openheid' wordt soms nagekomen. De ON neemt de OG vaak te laat mee in de processen, waardoor rug-tegen-de-muur situaties ontstaan en de problemen geëscaleerd moeten worden. Dit kan voorkomen worden als de ON van tevoren wat opener is. 'Tijdigheid' wordt soms nagekomen. Ten eerste, het omzetten van ontwerpaspecten naar werkvoorbereiding wordt niet tijdig gedaan door de ON. Dit komt o.a. door de aanpak van de ON. De ON is begonnen met een klein projectteam, waardoor de overlap tussen de ontwerpfase en uitvoeringsfase niet optimaal verloopt. Het afronden van de ontwerpfase vóórdat de uitvoeringsfase begint, is totaal niet gelukt. Op dit moment zitten we nog steeds met DO's en UO's, terwijl het werk al in uitvoering is. Ten tweede, afwijkingen worden niet altijd tijdig aangekondigd. Zo merkte ik tijdens een bezoek aan de bouwplaats een afwijking op die al werd uitgevoerd (i.e. beton werd al gestort), terwijl de afwijking niet eens was aangekondigd. - De doelen m.b.t. het projectresultaat zijn <u>niet</u> afgestemd tussen OG en ON. Ze zijn <u>wel</u> uitgewisseld met elkaar via de PSU, het Contractbeheersplan en het Project Management Plan, maar er is <u>geen</u> gezamenlijke doelstelling.	
Communicatie	
- De partijen houden zich over het algemeen aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Deze plannen werken goed, maar het DMS kan soms beter. - Er is informeel contact tussen OG en ON door elkaar te bellen en door de co-locatie op de Wiardaplantage. Door de co-locatie is het makkelijker om bij elkaar langs te komen om dingen af te stemmen of vast te leggen.	
Problemen oplossen	
- Ik ben <u>niet</u> direct betrokken geweest bij de contractvoorbereiding, maar ik denk dat de OG ervoor gekozen heeft om de Raad van Deskundigen (RvD) niet in te schakelen voor geschillenbeslechting (Basisovereenkomst art. 18) omdat de raad <u>geen</u> definitieve uitspraak geeft. - Ik weet <u>niet</u> waarom er gekozen is voor de Voorzieningenrechter. Ik ben <u>niet</u> direct betrokken geweest bij de contractvoorbereiding. - Problemen worden langs minnelijke weg opgelost door: veel overleg (maar is niet altijd even efficiënt bijvoorbeeld omdat niet de juiste mensen betrokken zijn), het escalatiemodel, de waarschuwingplicht van de OG bij toetsing (er wordt veel ter acceptatie gevraagd, hierdoor kunnen vragen of opmerkingen geplaatst worden bij onduidelijkheden) en samen te zoeken naar een oplossing (maar er wordt niet altijd geluisterd naar de OG vanwege de financiële prikkel van de ON. De ON heeft de opdracht scherp aangenomen en wil een zo goedkoop mogelijke oplossing bij een afwijking, terwijl de OG vaak een luxere oplossing wil. Dit verschil wordt ook veroorzaakt doordat de OG gewend is aan traditioneel opdrachtgeverschap). - Tot nu toe zijn alle problemen langs minnelijke weg opgelost, maar een aantal problemen zijn wel geëscaleerd tot het hoogste niveau.	
Risicoverdeling	
- De aanvullende risicoverdeling tussen OG en ON is <u>waarschijnlijk</u> toegevoegd aan de Basisovereenkomst (annex 12) omdat de OG (schijn)zekerheid zocht. Dit geldt over het algemeen voor elk contract. De aanvullende risicoverdeling maakt het wel een stuk duidelijker t.o.v. de UAV-GC 2005 hoe de risico's zijn verdeeld in dit project, hierdoor kunnen de risico's ook afgeprijsd worden door de ON. Echter, ik vraag me af of de risicoverdeling ook juridisch dekkend is, omdat de rechter ook rekening houdt met redelijkheid en billijkheid. In dit project is het standpunt van de OG dat er veel vooronderzoek is gedaan en verstrekt aan de ON, daarna zijn de bijbehorende risico's geheel voor de ON. - Ik weet <u>niet</u> hoe de OG de risicoverdeling heeft bepaald. Ik ben hier <u>niet</u> direct bij betrokken geweest. - Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. - Ik weet <u>niet</u> of de ON een risicoreservering in zijn inschrijfsom heeft opgenomen voor het dragen van zijn risico's. Nieuwe uitvoeringsrisico's zijn voor de ON en worden niet beloond. Bovendien staan er bonussen en boetes voor de ON in het contract	

met betrekking tot de risico's (Basisovereenkomst art. 16 en Annex 2). Bijvoorbeeld voor de stremmingen en afsluitingen van de vaarweg.
Continu verbeteren van de relatie
- De PSU en de PFU hebben de relatie tussen OG en ON <u>niet</u> verbeterd, maar ook <u>niet</u> verslechterd. Over het algemeen is de relatie tussen de teams van de OG en ON goed, maar sommige mensen botsen vaker dan anderen. Vertrouwen wordt niet gecreëerd met zulke meetings, want je kan wel dingen afspreken tijdens de meetings maar vervolgens moeten ze wel nagekomen worden. - De mogelijke verbeterpunten uit de PFU worden <u>niet</u> aangepakt. Dit betekent niet dat het slecht gaat in dit project, maar dat sommige dingen beter kunnen. Zo wordt de OG nog steeds niet meegenomen in het proces en moet er nog steeds veel getoetst worden. - Tijdens het project zijn er reguliere PFU's tussen de OG en ON ten behoeve van het verbeteren van de relatie. Echter, hier wordt niet optimaal gebruik van gemaakt, want een aantal mensen hebben het veel te druk om de PFU's goed voor te bereiden. Bovendien kan een PFU alleen effect hebben als beide partijen dat willen en dezelfde prikkel hebben.
Overige systemen of processen
Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON: tijdig escaleren en duidelijk, gedefinieerd verificatie en validatie systeem.

3. Antwoorden op de interviewvragen over 'wijzigingen'

Projectdoelen		
- De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn <u>niet</u> afgestemd betreft het resultaat. Deze zijn <u>wel</u> besproken tijdens de PSU, maar er is <u>geen</u> gezamenlijk doel. De ON streeft de doelstelling van de OG (i.e. het minimaliseren van scopewijzigingen en meerwerk) <u>niet</u> na. De ON zoekt naar financiële middelen en komt soms met twijfelachtige VTW's aan. - Voor scopewijzigingen moet toestemming worden gevraagd aan de stakeholders, maar deze komen vaak met nieuwe eisen of wensen. Het team van de OG moet dan rekening houden met de principes redelijkheid en billijkheid om te voorkomen dat de OG de verantwoordelijkheid van de aangepaste eis naar zich toe trekt. De OG en de ON moeten eigenlijk een gezamenlijk proces creëren voor de afhandeling van zulke wensen van de stakeholders, want het kan beter. - De doelstellingen van OG en ON m.b.t. risico management zijn afgestemd betreft de procedures, maar <u>niet</u> betreft het resultaat. Aan het begin van het project zijn er risico-afstemoverleggen geweest, waarbij elkaars doelen zijn besproken, maar er zijn <u>geen</u> gezamenlijk doelen of afspraken over gemaakt. De doelen van de OG en ON voor risicomanagement verschillen. Tot nu toe neemt de ON risicomanagement <u>niet</u> echt serieus, want de besproken risico's worden niet aangepakt. De ON moet ook risicogestuurd werken en rekening houden met projectspecifieke risico's, maar de ON is van mening dat risicomanagement 'business as usual' is.		
Risico management		
- De OG en de ON houden zich over het algemeen aan de opgestelde risico management plannen tijdens het project, maar uit de toetsing van het risico management proces blijkt dat de ON de procedure wel volgt, maar de risico's <u>niet</u> doorvertaalt naar ontwerp en uitvoering. - De aanpak van risico's door de OG is grotendeels proactief, want dit vormt de input voor de SCB. Er vinden regelmatig risicosessies en risicobeheer-overleggen plaats. - De aanpak van risico's door de ON is half reactief/half proactief, want de ON ziet een deel van de risico's niet als risico's maar als onderdelen van standaard bedrijfsvoering. Daarom doen ze er niet veel mee, omdat ze bang zijn ze zichzelf dan een verplichting opleggen en dat de OG hun eraan gaat houden.		
Wijzigingsprocedure		
- De gebruikte VTW-procedure wijkt af van de wijzigingsprocedure uit de UAV-GC 2005 (par. 14, 15 en 45) vanwege efficiëntie. Als de UAV-GC 2005 gevolgd wordt, duurt het proces langer. De OG geeft dan eerst een akkoord voor de VTW, dan pas volgt de offerte van de ON. Als de OG de VTW te duur vindt en wilt annuleren, zal een discussie volgen want er was immers al een akkoord voor de VTW. Daarom wil de OG in dit project gelijk een raming zien om een betere beslissing te kunnen nemen of hij verder wil gaan met de wijziging of niet. - Alle andere sub clausules van par. 14, 15 en 45 uit de UAV-GC 2005 die niet zijn vervallen, zijn wel van toepassing. De automatische acceptatieregeling wordt <u>niet</u> gebruikt, omdat de partijen hebben afgesproken om altijd te reageren en tot nu toe wordt dit ook gedaan. De toetsing om de bepalen of de ON verplicht is de wijziging uit te voeren wordt niet gedaan, maar dit leidt meestal niet tot een discussie. - De OG en de ON houden zich op grote lijnen aan de opgestelde VTW-procedure tijdens het project, maar de snelheid kan beter. Er zitten VTW's bij waarvan de afhandeling als maanden duurt, soms komt dit doordat de prijs er nog niet op is gezet. Een automatische acceptatieregeling is geen goede oplossing, want beide partijen zijn te druk met andere dingen. - Ik weet <u>niet</u> waarom de aanvulling met de extra controle- en waarschuwingsplicht voor de ON in de Basisovereenkomst (annex14) is toegevoegd. Ik ben hier <u>niet</u> direct bij betrokken geweest. De OG is <u>niet</u> gewend om met de UAV-GC 2005 te werken en wilde hiermee misschien (schijn)veiligheid inbouwen, maar ook hier spelen redelijkheid en billijkheid een rol. Zo kan de OG van de ON niet verwachten dat hij tijdens de aanbesteding alle documenten uitgebreid heeft kunnen bestuderen. Bovendien, als de OG alles naar de ON toe schuift, gaat de ON alleen maar minder focussen op de dingen die de OG echt belangrijk vindt. - De aanpak van wijzigingen door de OG is grotendeels proactief. Als de OG een potentiële wijziging signaleert, wordt deze opgepakt en neergelegd bij de ON. Vervolgens moet de ON deze uitwerken en een voorstel doen. Het gaat niet om veel wijzigingen vanuit de OG. - De aanpak van wijzigingen door de ON is half reactief/half proactief. Het signaleren en oppakken van de wijzigingen door de ON gaat goed, maar het kan soms lang duren om de consequenties van de wijziging te bepalen. - De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:		
9.	Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10.	Het wijzigingsvoorstel opnemen in een logboek	X
11.	De prioriteit van de wijziging bepalen	-
12.	Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	-
13.	De impacts van de verschillende wijzigingsopties bepalen	-

14.	(Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15.	Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16.	Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	X
5.	De uitvoering van de wijziging monitoren en documenteren.	1/2
Opmerkingen: Bij 10, dit doen beide partijen. Bij 11, dit gebeurt niet expliciet, maar als het echt een belangrijke contractwijziging is, worden de partijen er wel op geattendeerd. Bij 14, de snelheid van besluitvorming hangt af van de prioriteit van de wijzigingen en of er technisch en financieel een overeenkomst is. Bij 16, dit doen beide partijen. Bij 5, het monitoren is verschillend voor de ontwerp- en uitvoeringswijzigingen. Documenteren gebeurt niet expliciet, maar gebeurt d.m.v. de acceptatie van de aangepaste documenten.		
Continu verbeteren		
- Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. - De performance van de risico management processen van de ON wordt tijdens het project <u>niet</u> gemeten en bijgestuurd. Het is mij niet duidelijk hoe dit gedaan kan worden. De risicoprocesen van de OG bestaan en volgens mij zijn deze effectief. Met de audit wordt alleen getoetst of de ON doet wat ze gezegd hebben te doen, er wordt dus <u>niet</u> gekeken naar wat beter kan. Het bijsturen van het proces moet de ON zelf doen.		
Overige systemen of processen		
Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingsproces.		

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)

Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):

	1.	Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
	2.	Redelijk gedrag
	3.	Systeem voor continu verbeteren van de relatie
	4.	Emotionele investeringen
C	5.	Problemen oplossen op het eerste niveau
C	6.	Tijdig escaleren
C	7.	Duidelijk communicatiesysteem
	8.	Veel communicatie en interacties
	9.	Samen problemen oplossen
C	10.	Duidelijk, gedefinieerd verificatie en validatie systeem
	11.	Gedeelde projectdoelen
C	12.	Eerlijke/proportionele risicoverdeling
	13.	Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
	14.	Betrouwbaarheid: cultuur, beleid

Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingsproces (C = in contract opnemen):

C	1.	Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
C	2.	Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
C	3.	Adequate documentatie van de wijziging
C	4.	Risico management systeem
C	5.	Vroegtijdige waarschuwingsplicht
	6.	Leren van wijzigingen en kennis hiervan delen
	7.	Gedeelde projectdoelen voor wijzigingenbeheer en risico management
C	8.	Eerlijke/proportionele risicoverdeling

Invloed vertrouwen op wijzigingsproces

- De efficiëntie van het wijzigingsproces worden voor <u>50%</u> bepaald door het vertrouwensniveau tussen OG en ON. De meeste discussies gaan over de prijs van de wijziging. Als er geen of weinig vertrouwen is, moeten er meer middelen (tijd, geld etc.) worden ingezet voor controle van een wijziging en impact. Als er vertrouwen is, verloopt het proces voorspoediger en gaat de OG er meer van uit dat hij niet wordt opgelicht. - De effectiviteit van het wijzigingsproces worden voor <u>0%</u> bepaald door het vertrouwensniveau tussen OG en ON. Alles wat de partijen wijzigen (ook al heeft het geen consequenties voor tijd en geld), moet via de wijzigingsprocedure vastgelegd worden, hier is geen vertrouwen voor nodig. Het doel is de wijziging doorvoeren.		

INTERVIEW VERSLAG #6P

Interview:	Project Drachtsterweg t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	21-10-2014
Tijd:	11.00 – 13.00u
Locatie:	Kantoor Vrij-Baan Leeuwarden (Snelliusweg 11)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	05-01-2015
Gevalideerd (DD/MM/JJJJ):	07-01-2015

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
RT	Rob Tomasouw	Risicomanager	RHDHV	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
Ik was <u>niet</u> betrokken bij de aanbesteding.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW en de UAV-GC 2005 hebben in het beginsel <u>geen</u> invloed op het gedrag van de partijen, maar hier wordt pas naar gekeken als er conflicten zijn. Er zullen altijd felle gesprekken zijn tussen de partijen, voordat ze aan redelijkheid en billijkheid denken. - In dit project laat de ON het er wel heel erg op aankomen. De algemene houding van een ON is in dit project <u>veel erger</u> t.o.v. andere projecten: De OG wil wat, de ON weet wel hoe, maar dit moet buiten het contract gedaan worden. OG wees nou maar redelijk, dan zorgt de ON ervoor dat het op tijd klaar is. De ON speelt dus heel erg in op de redelijkheid en billijkheid van de OG en is daarom zelf minder redelijk en billijk. De ON zegt wel dat hij meedenkt, maar ik merk in verschillende zaken dat dat met een hele grote reserve is. De exacte reden dat de ON niet redelijk en billijk is, is <u>niet</u> duidelijk. - Vanuit een risicoanalyse is gebleken dat de ON het gevoel heeft dat de OG de ON <u>niet</u> vertrouwt. Dit komt o.a. door de projectorganisatie van de OG. Ten eerste, de OG heeft een toezichthouder op de bouwplaats rondlopen. Ten tweede, de OG zit er best wel strak op met de overleggen en de controles op de acceptatiedocumenten. - De gemaakte Samenwerkingsafspraken hebben <u>geen</u> invloed op het gedrag van de partijen, want deze worden <u>niet</u> nagekomen. Afspraken maken is leuk, maar heel snel daarna doen de partijen weer wat ze gewend zijn te doen.	
Projectdoelen	
- De gemaakte Samenwerkingsafspraken worden tot nu toe <u>niet</u> nagekomen door beide partijen als het gaat om risico management. 'Openheid' wordt <u>niet</u> nagekomen. De OG is meer open dan de ON (dit geldt tevens voor andere aspecten dan risico management). Tijdens risico-overleggen worden de risicodossiers naast elkaar gelegd, vervolgens worden er risicoanalyses gemaakt. Hierbij merk ik dat de ON niet geheel open is, terwijl dat wel is gevraagd door de OG. Zo pakt de ON risico management niet zo serieus aan (e.g. ON erkent sommige risico's niet en pakt risico's pas aan als ze optreden). De ON heeft zich met een bepaald verwacht risicoprofiel ingeschreven. Deze informatie willen ze niet delen met de OG. 'Tijdigheid' betreft planningsproblemen wordt <u>niet</u> nagekomen. De ON maakte pas heel laat kenbaar dat hij de door zichzelf gestelde einddatum niet gaat redden, terwijl de OG dit al ruim van tevoren (december 2013) had nagevraagd. Ik denk dat de ON het toen al wist, maar dat ze hun eigen plan van aanpak doorgedrukt hebben om het er uiteindelijk op aan te laten komen. Deels komt het ook omdat het team van de ON vanuit Rosmalen werkt waardoor het niet mogelijk is om informeel overleg te houden. Dit wordt echter wel steeds beter heb ik gehoord. - Ik weet <u>niet</u> of de doelen m.b.t. het projectresultaat zijn afgestemd tussen OG en ON. Volgens mijn gevoel is dit <u>niet</u> gedaan.	
Communicatie	
- De partijen houden zich over het algemeen aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Ik ben hier niet direct bij betrokken, maar ik kijk steekproefsgewijs welke documenten er zijn en of de ON de risico's heeft benoemd in de VO's, DO's en UO's. Echter, uit de PFU bleek dat de OG vindt dat de ON meer moet communiceren, maar de ON vindt dat de OG er te dicht op zit. - Door de co-locatie hebben de teams van de OG en ON regelmatig informeel contact door bij elkaar langs te komen. In dit project is er informeel overleg, maar de conclusies of de samenvatting hieruit worden vervolgens niet of slecht vastgelegd in een document zoals een verslag van een formeel overleg. Zo zijn er vanuit de claim management betreft de grondgesteldheid essentiële dingen besproken met ON, maar dit is nergens vastgelegd. De verslagen van de formele overleggen zijn soms voor 80% een kopie van het vorige verslag.	
Problemen oplossen	
- Ik weet <u>niet</u> waarom de OG heeft gekozen om de Raad van Deskundigen (RvD) niet in te schakelen voor geschillenbeslechting (Basisovereenkomst art. 18). Ik heb <u>geen</u> ervaring met een RvD, dus ik kan ook geen gooi doen waarom een OG hier wel of niet voor kiest. - Ik weet <u>niet</u> waarom ervoor gekozen is om de Raad van Arbitrage (RvA) niet in te schakelen voor geschillenbeslechting (volgens Basisovereenkomst art. 18 is par. 47 vervallen). Ik ben hier <u>niet</u> direct bij betrokken geweest. Over het algemeen lijkt de RvA partijdig te kunnen zijn voor de ON omdat de mensen in de raad ook uit de aannemerij komen. Bovendien zoekt de RvA vaak naar een compromis, maar hier schieten beide partijen niets mee op. De rechter is daarentegen onafhankelijk en kijkt wat er op papier staat om vervolgens een beslissing te nemen. De rechter is minder geneigd om naar een compromis te kijken. - Ik weet <u>niet</u> waarom er gekozen is voor de Voorzieningenrechter. Ik ben hier <u>niet</u> direct bij betrokken geweest. De Voorzieningenrechter is het alternatief als de OG niet kiest voor de Raad van Arbitrage. In projecten is het gebruikelijk om de Voorzieningenrechter te kiezen voor geschillenbeslechting. Meestal is deze keuze opgelegd vanuit de inkoopafdeling of is het onderdeel van het algemeen beleid van de OG. Als de partijen voor een kort geding kiezen, is het misschien ook belangrijk om af te spreken dat ze zich moeten neerleggen bij de uitspraak.	

▪ Er wordt te weinig gedaan om problemen betreft risico management langs minnelijke weg op te lossen. Hierdoor ontstaan er heel vaak rug-tegen-de-muur situaties. ▪ Meestal is er <u>geen</u> vroegtijdige waarschuwing of het is een halve waarschuwing. De ON geeft dan bijvoorbeeld alleen de tijdconsequenties aan, terwijl er ook kostenconsequenties zijn. De ON is teveel geneigd om OG hier in een (te) laat stadium over in te lichten. ▪ Het samen oplossen van problemen is <u>niet</u> optimaal, want het zoeken naar oplossingen is over het algemeen eenzijdig. De OG kiest voor een D&B samenwerkingsvorm als hij gebruik wil maken van de kennis en innovatie van de ON en verwacht dan ook dat de ON meedenkt en met oplossingen aan komt. In dit project gebeurt dit zeker niet, want t.o.v. andere UAV-GC projecten denkt de ON veel minder mee of duurt het veel te lang voordat de ON met een oplossing komt. Samenwerken is dus noodzakelijk doordat de ON <u>niet</u> het initiatief neemt. Aan de ene kant is dit goed om de belangen van de OG (i.e. zo snel mogelijk, maar met zo min mogelijk hinder het project tot stand brengen) te beschermen. Aan de andere kant is dit niet goed omdat de OG gekozen heeft voor D&B. Vanuit het risico management is intern met het team besproken of de OG de ON niet teveel bij de hand neemt. ▪ Tot nu toe zijn alle problemen langs minnelijke weg opgelost. In dit project verwacht ik dat de partijen <u>niet heel snel</u> naar de rechter stappen. Een aantal zaken zijn wel geëscaleerd tot het hoogste niveau, zoals de bodemgesteldheid claim en de uitloop van de werkzaamheden. Claim management is pas sinds twee maanden opgezet om de OG voor te bereiden voor eventuele claims van de ON.
Risicoverdeling ▪ Ik weet <u>niet</u> waarom de aanvullende risicoverdeling tussen OG en ON is toegevoegd aan de Basisovereenkomst (annex 12) en of deze overeenkomt met de UAV-GC 2005. Ik ben hier <u>niet</u> direct bij betrokken geweest. Sommige risico's zijn doorgeschoven naar de ON door de toevoeging van een drempel. Betreft de risico's voor de ON, de OG heeft de intentie hiermee billijk om te gaan als het aantoonbaar is dat het risico optreedt door de schuld van de OG. ▪ De aanvullende risicoverdeling is hard zodat de ON zijn risico's meeneemt in zijn inschrijfsom, maar er wordt wel rekening gehouden met redelijkheid en billijkheid. ▪ De risico's zijn toebedeeld aan de partij die het beste in staat is deze te dragen. Hier heb ik een voorstel voor gedaan in het risicodossier. ▪ Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. Hier is <u>bewust</u> voor gekozen om vooraf scherp neer te zetten bij wie het risico ligt, zodat de partijen niet in discussie gaan zonder te kijken hoe het risico verminderd en beheerst kan worden. In de praktijk gebeurt namelijk het volgende waarbij redelijkheid en billijkheid een rol speelt: de partijen gaan het probleem oplossen en daarna praten ze pas over de kosten. ▪ De ON wordt beloofd voor het dragen van het risico via een eventuele risicoreservering in de inschrijfsom. Het is aan de ON om dit wel of niet te doen. Nieuwe uitvoeringsrisico's worden niet beloofd, want deze zijn inbegrepen in de risicoreservering van de ON.
Continu verbeteren van de relatie ▪ De PSU en de PFU hebben de relatie tussen OG en ON <u>niet</u> verbeterd (ik was <u>niet</u> betrokken bij de PFU). Dit komt o.a. doordat het team van de ON tussen de PSU en de PFU is veranderd (andere proces manager en uitvoerders), terwijl gezicht van de OG naar de ON onveranderd is gebleven. ▪ De aanwezigen bij de PSU deden serieus mee. Ik vraag me af of de ON had nagedacht over welke mensen ze ernaartoe zouden sturen. De OG had dit eigenlijk moeten afstemmen of navragen van tevoren om de conclusies uit de PSU te optimaliseren. Zo had ik bijvoorbeeld geen risico manager tegenover me en had de ON veel meer inhoudelijke mensen gestuurd, terwijl de OG slechts één inhoudelijke had gestuurd. ▪ Ik weet <u>niet</u> of de mogelijke verbeterpunten uit de PFU zijn aangepakt. Ik was <u>niet</u> betrokken bij de PFU en weet dus niet wat de achtergrond van deze punten is. Ik heb het gevoel dat de punten voornamelijk vanuit de ON zijn opgezet, want het gaat om zaken waar vooral de ON last van heeft. ▪ Tijdens het project zijn er PFU's afgesproken tussen de OG en ON ten behoeve van het verbeteren van de relatie, maar deze zijn onregelmatig.
Overige systemen of processen ▪ Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON: open communiceren.

3. Antwoorden op de interviewvragen over 'wijzigingen'

Projectdoelen ▪ Ik weet <u>niet</u> of de doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn afgestemd betreft het resultaat, hiervoor ken ik het PMP van de ON niet goed genoeg. ▪ De doelstellingen van OG en ON m.b.t. risico management zijn afgestemd betreft de procedures, maar <u>niet</u> betreft het resultaat. ▪ Het laatstgenoemde wordt wel telkens besproken, maar de OG merkt dat de ON daar <u>niet</u> open over is. Het beheren van de risico's door de ON is minimaal en de risico's worden pas aangepakt als ze optreden. Bovendien worden veel risico's niet opgenomen in het risicodossier omdat deze volgens de ON standaard bedrijfsrisico's zijn. ▪ De procedures zijn wel afgestemd. De frequentie van de risico-overleggen zijn vastgelegd in het contract. De OG en ON verschillen meestal van mening over de beoordeling van het risico-impact, het contract is hier niet eenduidig over. De wijze van risicowaardering is ook afgestemd, maar de risicowaardering zelf niet, want deze zijn voor beide partijen verschillend. Bijvoorbeeld, de gevolgen voor tijd en geld zijn voor de ON anders dan voor de OG vanwege de verschillende budgetten waarmee de teams moeten werken. De risico's die voor beide partijen belangrijk zijn, komen in beide risicodossiers voor. De informatie betreffende de actor van de beheersmaatregelen wordt gedeeld tussen de partijen.
Risico management ▪ De OG en de ON houden zich over het algemeen aan de opgestelde risico management plannen tijdens het project. Tekstueel nemen OG en ON dingen van elkaar over, behalve de waardering van de kansen en effecten. Deze worden toegelicht tijdens de risico-overleggen. Echter, de OG en ON laten elkaar vrij om deze aan te passen. ▪ De aanpak van risico's door de OG is half reactief/half proactief. Ik merk ook bij andere projecten waar ik over het risico management dat risico management niet echt tussen de oren zit. De houding van de OG is nog teveel van: we weten wel hoe we het moeten oplossen. Het identificeren van risico's gaat goed, maar het beheersen van risico's kan beter.

- Het is moeilijk om iets te zeggen over de aanpak van risico's door de ON, want bedrijfsrisico's worden door de ON niet opgenomen in het risicodossier en worden ook niet gedeeld met de OG. De aanpak van risico's door de ON is grotendeels reactief, want het is niet duidelijk of de bedrijfsrisico's daadwerkelijk beheerd worden, maar ik ga ervan uit dat de ON niet zal wachten totdat het risico zich voordoet. - Risico management speelt <u>geen</u> rol in de VTW-procedure, want ik zie risico's <u>niet</u> terugkomen in de VTW's. Als er een VTW is, wordt er niet in het risicodossier gekeken naar hoe de OG ermee is omgegaan en wat de OG er van tevoren over had bedacht. Als er beheersmaatregelen van risico's zijn die een contractwijziging bevatten, dan zijn deze reeds meegenomen in het contract of de inschrijfsom van de ON.	
Wijzigingsprocedure	
- Ik weet <u>niet</u> of de gebruikte VTW-procedure afwijkt van de wijzigingsprocedure uit de UAV-GC 2005 (par. 14, 15 en 45). Ik ben hier <u>niet</u> direct bij betrokken. - Ik weet <u>niet</u> welke sub clausules van par. 14, 15 en 45 uit de UAV-GC 2005 zijn van toepassing zijn en worden gebruikt. Ik ben hier <u>niet</u> direct bij betrokken. - Ik weet <u>niet</u> of de OG en de ON zich houden aan de opgestelde VTW-procedure tijdens het project. Ik ben hier <u>niet</u> direct bij betrokken, maar ik heb gehoord dat de partijen zich er niet aan houden en dat ze elkaar vooral steeds onder druk zetten. De VTW's vanuit de ON zijn altijd te laat, want de ON is een VTW al aan het uitvoeren terwijl die nog niet ingediend is. De VTW's vanuit de OG zijn wel redelijk op tijd, maar dit geldt niet voor alle VTW's. Over het algemeen kan de VTW-procedure wat beter. - Ik weet <u>niet</u> waarom de aanvulling met de extra controle- en waarschuwingsplicht voor de ON in de Basisovereenkomst (annex14) is toegevoegd. Ik ben hier <u>niet</u> direct bij betrokken geweest. - De ON voldoet <u>niet of te laat</u> aan deze extra controle- en waarschuwingsplicht. - De aanpak van wijzigingen door de OG is half reactief/half proactief, want de OG wil <u>geen</u> VTW's omdat deze meestal geld kosten of ten koste gaan van de planning. - De aanpak van wijzigingen door de ON is half reactief/half proactief. Aan de ene kant laat de ON het erop aankomen en ziet de ON contractwijzigingen <u>niet</u> ver van tevoren aankomen. Aan de andere kant wil de ON een VTW snel afwerken. De ON benadrukt dat hij weet hoe het moet en dat de OG niet moet zeuren omdat het doorvoeren van een VTW voornamelijk administratief werk is. Dit botst weleens omdat de ON zo vlak mogelijk wil zijn op de consequenties voor tijd en geld, terwijl de OG wil weten waaraan hij toe is. - De extra controle- en waarschuwingsplicht en de standaard waarschuwingsplicht spelen <u>geen</u> rol in de wijzigingsprocedure, want het gedrag van de ON is niet anders dan bij andere projecten. Als de waarschuwingsplicht gebruikt wordt, is het een late waarschuwing. - Ik weet <u>niet</u> of de volgende processen deel uitmaken van de VTW-procedure en worden uitgevoerd door ON of OG. Ik ben hier <u>niet</u> direct bij betrokken.	
9.	Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen
10.	Het wijzigingsvoorstel opnemen in een logboek
11.	De prioriteit van de wijziging bepalen
12.	Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.
13.	De impacts van de verschillende wijzigingsopties bepalen
14.	(Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.
15.	Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.
16.	Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.
5.	De uitvoering van de wijziging monitoren en documenteren.
Opmerkingen:	
Continu verbeteren	
- Ik weet <u>niet</u> of er tijdens het project <u>geen</u> 'lessons learned' worden gecreëerd voor wijzigingen. Ik ben hier <u>niet</u> direct bij betrokken. - De performance van de risico management processen wordt tijdens het project <u>niet</u> gemeten en bijgestuurd.	
Overige systemen of processen	
Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingenproces.	

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)	
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):	
C	1. Open communiceren
C	2. Gedeelde projectdoelen
	3. Samen problemen oplossen
	4. Emotionele investeringen
	5. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
	6. Duidelijk communicatiesysteem
	7. Systeem voor continu verbeteren van de relatie
	8. Redelijk gedrag
	9. Problemen oplossen op het eerste niveau
	10. Betrouwbaarheid: cultuur, beleid
	11. Veel communicatie en interacties
	12. Eerlijke/proportionele risicoverdeling
	13. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):	
	1. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
	2. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
C	3. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
	4. Leren van wijzigingen en kennis hiervan delen
	5. Eerlijke/proportionele risicoverdeling
C	6. Adequate documentatie van de wijziging
C	7. Vroegtijdige waarschuwingsplicht
C	8. Risico management systeem
Invloed vertrouwen op wijzigingenproces	
- De efficiëntie van het wijzigingenproces worden voor <u>80%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er geen of weinig vertrouwen is, moeten er meer middelen (tijd, geld etc.) worden ingezet voor controle van een wijziging en impact. Als er veel vertrouwen is, zijn de partijen zo door de procedure heen. - De effectiviteit van het wijzigingenproces worden voor <u>80%</u> bepaald door het vertrouwensniveau tussen OG en ON. Aan de ene kant, voor het afstemmen van de wijzigingsprocedure en het doorvoeren van een wijziging volgens de wijzigingsprocedure is geen vertrouwen voor nodig. Aan de andere kant, als er geen vertrouwen is, gaan de hakken van beide partijen in het zand. Dan is elke voorgestelde wijziging geen contractwijziging en is er altijd commentaar op de VTW vanuit de OG en ON. Er is dan onenigheid over of het een juiste wijziging is en of het een toegevoegde waarde heeft.	

INTERVIEW VERSLAG #7C

Interview:	Project Drachtsterweg t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	06-10-2014
Tijd:	15.00 – 17.00u
Locatie:	Kantoor Heijmans Rosmalen (Graafsebaan 3)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	05-01-2015
Gevalideerd (DD/MM/JJJJ):	19-01-2015 (automatisch)

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
AP	André Plagmeijer	Projectmanager	Heijmans	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
- Een aparte afdeling bij Heijmans heeft de selectiefase van de aanbesteding gedaan. Ik, als tendermanager, was pas na de selectiefase betrokken. - De uitsluitingsgronden en de minimumeisen die gesteld werden aan de aannemers zijn standaard eisen. Voor Heijmans is het eenvoudig om aan deze eisen te voldoen. - Op persoonlijk niveau zijn er tijdens de aanbesteding <u>geen</u> eisen gesteld aan de werknemers van de ON. - De individuele informatie-uitwisselingsrondes hadden <u>geen</u> invloed op het vertrouwensniveau tussen de OG en de ON. De ON was betrokken bij 1 ronde. Het was niet duidelijk dat er een Plan van Aanpak (PvA) moest zijn, want het maakte geen deel uit van de gunningscriteria. - Tijdens deze uitwisselingsrondes was er <u>niet</u> veel animo om het PvA openlijk te bespreken, omdat de OG dan elementen hieruit kan halen om het contract dicht te timmeren. Het is namelijk mogelijk dat de OG bepaalde aspecten waarmee wij ons onderscheiden van de anderen omzet in eisen die ook voor de andere partijen gelden of dat wij te horen krijgen dat iets niet mag en dat de OG vervolgens de eis aanpast. Hoe dan ook, het bespreken van het PvA met de OG zou onze kansen kunnen verlagen. Daarom zijn er alleen vragen gesteld om te kijken hoe de OG hierop zou reageren.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW heeft <u>geen</u> invloed op het gedrag van de partijen. Uiteindelijk wordt er wel op basis van redelijkheid en billijkheid besluiten genomen, maar de principes gelden niet altijd gelijk vanaf de start van de gesprekken omdat het voor beide partijen soms nodig is om de zaken harder neer te leggen. Redelijkheid en billijkheid zijn in Nederland meer algemene principes, in Frankrijk bijvoorbeeld zal dit misschien wel anders zijn. In Nederlandse projecten is er altijd wel een zekere mate van redelijkheid en billijkheid. - Het contract is <u>niet geheel</u> zwartwit en daarom niet altijd even duidelijk over wat redelijk en billijk is. De ON interpreteert aspecten vaak op een andere manier dan de OG. Hierdoor is het lastig iets om overeen te komen. - De gemaakte Samenwerkingsafspraken hebben <u>wel</u> invloed op het gedrag van de partijen, maar het kan beter. Zo merk ik dat de partijen niet geheel open zijn tijdens de overleggen.	
Projectdoelen	
- De gemaakte Samenwerkingsafspraken worden tot nu toe zoveel mogelijk nagekomen door beide partijen, maar het kan beter. Het is nodig om elkaar eraan te herinneren. - De doelen m.b.t. het projectresultaat zijn <u>niet</u> afgestemd tussen OG en ON. De doelstellingen van de ON staan in het PMP (opgesteld in de aanbestedingsfase) en zijn gebaseerd op de Vraagspecificaties. De doelstellingen van de OG staan in het Contractbeheersplan. Dit document heeft de ON vrij laat gekregen, waardoor het niet mogelijk was om de doelstellingen af te stemmen op elkaar. Tevens was het niet bekend voor de ON dat er een Contractbeheersplan zou zijn.	
Communicatie	
- De partijen houden zich over het algemeen aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Deze plannen werken redelijk goed. - Er is informeel contact tussen OG en ON via de informele overleggen tussen Edward, André en Jörgen (elke 2 weken) en via de informele directieoverleggen tussen Sieds, Edward, Directeur Heijmans en André (elke 2 maanden). Tussen de overleggen door hebben de wij ook wel informeel contact wel elkaar, maar dit is lastig vanwege de afstand tussen onze kantoren (Leeuwarden en Rosmalen). Edward en ik zitten namelijk niet fulltime op dit project.	
Problemen oplossen	
- De OG heeft ervoor gekozen om de Raad van Deskundigen (RvD) niet in te schakelen voor geschillenbeslechting (Basisovereenkomst art. 18), hier heeft de ON <u>geen</u> invloed op gehad. De keuze is <u>niet</u> logisch, want de RvD kan een geschil veel meer op basis van deskundigheid beoordelen, terwijl een rechter de zaken enkel beoordeelt op basis van wat op papier en in de wetten staat. Het is gebruikelijk voor Provincies om de RvD niet in te schakelen, RWS doet dit meestal wel. - De OG heeft gekozen voor de Voorzieningenrechter, hier heeft de ON <u>geen</u> invloed op gehad. De keuze is gebruikelijk in projecten van Provincies. Uit het contract is duidelijk op te maken dat veel stukken zijn overgenomen uit de contracten van andere projecten. - Problemen worden langs minnelijke weg opgelost door: veel overleg, argumenten uitwisselen, voorstellen van de ON afstemmen op de lagere niveaus en laten goedkeuren door de disciplineleiders en project managers (hierbij is heldere communicatie essentieel om interpretatieproblemen te voorkomen) en het escalatiemodel. - Het escalatiemodel werkt niet optimaal door de verschillende mandaatregelingen op de niveaus tussen OG en ON. Zo heeft bij de ON 1 persoon de bevoegdheid om alles te beslissen, terwijl het bij de OG meer getrap is. De contractmanager en de project manager hebben namelijk slechts een beperkt mandaat en mogen haast niks beslissen. De programma manager heeft een volledig mandaat, maar de discussies duren meestal lang doordat problemen eerst op de lagere niveaus besproken worden. Met dit escalatiemodel valt er niks te escaleren, want de meeste problemen moeten eigenlijk gelijk naar het hoogste niveau.	

Tot nu toe zijn alle problemen langs minnelijke weg opgelost.
Risicoverdeling
- De aanvullende risicoverdeling tussen OG en ON is <u>waarschijnlijk</u> toegevoegd aan de Basisovereenkomst (annex 12) omdat de OG probeerde zichzelf extra in te dekken. De risico's in de aanvulling zijn waarschijnlijk overgenomen uit contracten van andere projecten. - De OG heeft de risicoverdeling bepaald, waarbij de risico's zoveel mogelijk doorgeschoven zijn naar de ON. De OG is van mening dat bij een D&C contract alle risico's bij de ON horen en houdt <u>geen</u> rekening met redelijkheid en billijkheid. Dit is vooral als het gaat om de grondgesteldheid. Een lopende discussie gaat over dat de grondgesteldheid afwijkt van wat de ON had mogen verwachten. - Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. - De ON wordt beloond voor het dragen van het risico via een eventuele risicoreservering in de inschrijfsom, maar niet alles wordt afgeprijsd omdat de inschrijfsom laag moet blijven om de opdracht binnen te halen. Bovendien is het lastig om risico's af te prijzen omdat je niet alles kan weten, dit geldt met name voor de bodemgesteldheid. Daarom zijn de principes redelijkheid en billijkheid belangrijk hierbij.
Continu verbeteren van de relatie
- De PSU en de PFU hebben de relatie tussen OG en ON verbeterd. Iedereen deed serieus mee. - De mogelijke verbeterpunten uit de PFU zijn <u>niet</u> allemaal aangepakt. Het afstemmen over de invulling van het D&C contract is tijdens de PFU besproken. Gezamenlijke omgevingsmanagement wordt gedaan, maar is niet altijd een succes want de OG lijkt soms bezorgder dan de omgeving zelf. De trage besluitvorming door de OG is niet verbeterd, want deze wordt veroorzaakt door de mandaatregelingen en de verantwoording richting de stakeholders. De trage besluitvorming belemmert het uitvoeringsproces. - Tijdens het project zijn er regelmatig PFU's tussen de OG en ON ten behoeve van het verbeteren van de relatie, waarbij specifieke aandachtspunten worden besproken.
Overige systemen of processen
- Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON. - Aanvulling op 'Gedeelde projectdoelen': het afstemmen van de duurzaamheids-eye catcher.

3. Antwoorden op de interviewvragen over 'wijzigingen'

Projectdoelen		
- De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn <u>niet</u> afgestemd betreft het resultaat. Om de doelstelling te bereiken zou de OG eigenlijk moeten kijken naar de oorzaak van contractwijzigingen vanuit de ON. De OG zou het aantal contractwijzigingen kunnen verminderen door bijvoorbeeld met de ON meer samen te werken om tot een projectresultaat te komen. - De doelstellingen van OG en ON m.b.t. risico management zijn afgestemd <u>niet</u> betreft het resultaat, want de doelstelling van de OG die is opgenomen in de Vraagspecificatie deel 2 ('het identificeren en beheersen van risico's ten behoeve van het beheerst laten verlopen van het ontwerp- en uitvoeringsproces') komt overeen met de standaard doelstelling van de ON voor risico management.		
Risico management		
- De OG en de ON houden zich over het algemeen aan de opgestelde risico management plannen tijdens het project. Deze plannen werken goed, maar er zijn weleens discussies tussen de partijen over de verantwoordelijkheid voor de risico's. - De aanpak van risico's door de ON is grotendeels proactief. De ON houdt interne risicosessies waaruit nieuwe risico's naar voren komen.		
Wijzigingsprocedure		
- Ik weet <u>niet</u> of de gebruikte VTW-procedure afwijkt van de wijzigingsprocedure uit de UAV-GC 2005 (par. 14, 15 en 45). Dit zal Rolf weten. - Tijdens de VTW-procedure wordt er <u>niet</u> naar de UAV-GC 2005 gekeken, want meestal gaat het om een contractwijziging die de ON wel wil uitvoeren. Het is dan van belang deze goed vast te leggen en af te prijzen. - De OG en de ON houden zich aan de opgestelde VTW-procedure tijdens het project. Er zijn geen problemen met deze procedure. - De aanvulling met de extra controle- en waarschuwingsplicht voor de ON in de Basisovereenkomst (annex14) is <u>waarschijnlijk</u> toegevoegd omdat de OG probeerde zich extra in te dekken. Deze aanvulling is waarschijnlijk gekopieerd uit eerdere contracten en legt een zwaardere controleplicht op aan de ON. - De ON controleert de documenten wel, maar voert geen bewuste <u>extra</u> controle uit. Bovendien is het moeilijk om te bepalen of de OG gewaarschuwd moet worden omdat het contract vol staat met dingen die op verschillende manieren te interpreteren zijn. Tot nu toe zijn hier geen problemen mee geweest en heeft de OG nog niet verwezen naar de extra controle- en waarschuwingsplicht. - De aanpak van wijzigingen door de ON is grotendeels proactief. - De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:		
9.	Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10.	Het wijzigingsvoorstel opnemen in een logboek	X
11.	De prioriteit van de wijziging bepalen	-
12.	Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	1/2
13.	De impacts van de verschillende wijzigingsopties bepalen	1/2
14.	(Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15.	Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16.	Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	X
5.	De uitvoering van de wijziging monitoren en documenteren.	X
Opmerkingen: Bij 12-13, geldt vaak alleen in geval van grote wijzigingen. Bij 14, de snelheid van besluitvorming hangt af van de prioriteit en de impact van de wijziging op het werk. Bij 15, via het VTW-overleg.		

Bij 16, in de vorm van revisies van de VTW's. Bij 5, monitoren is essentieel anders wordt het uitgevoerde werk niet betaald.	
Continu verbeteren	
- Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Dit gebeurt alleen voor afwijkingen omdat dit onderdeel is van het kwaliteitssysteem. Het leren van wijzigingen is meer iets voor de OG. Contractwijzigingen ontstaan namelijk doordat er gaten in het contract zitten of als gevolg van extra wensen vanuit de OG. Soms heeft de OG niet voldoende nagedacht over bepaalde aspecten tijdens de contractvoorbereiding en bovendien kon de OG niet alles voorzien omdat de aanbidding van de ON en de uitvoeringswijze nog onbekend was. - Ik weet <u>niet</u> of de performance van de risico management processen tijdens het project wordt gemeten en bijgestuurd. Misschien is dit onderdeel van het kwaliteitssysteem. De risico management aanpak is in ieder geval wel pro-actiever geworden.	
Overige systemen of processen	
Ik weet <u>niet</u> of er andere systemen of processen dan die al waren gegeven (zie laatste pagina) zijn, die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingenproces. Dit zal Rolf beter weten.	

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)	
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):	
C	1. Gedeelde projectdoelen
	2. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
	3. Redelijk gedrag
C	4. Eerlijke/proportionele risicoverdeling
	5. Problemen oplossen op het eerste niveau
	6. Systeem voor continu verbeteren van de relatie
	7. Samen problemen oplossen
	8. Emotionele investeringen
	9. Veel communicatie en interacties
	10. Duidelijk communicatiesysteem
	11. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
	12. Betrouwbaarheid: cultuur, beleid
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):	
C	1. Eerlijke/proportionele risicoverdeling
C	2. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
	3. Risico management systeem
	4. Vroegtijdige waarschuwingsplicht
	5. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
C	6. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
	7. Adequate documentatie van de wijziging
	8. Leren van wijzigingen en kennis hiervan delen
Invloed vertrouwen op wijzigingenproces	
- De efficiëntie van het wijzigingenproces worden voor <u>90%</u> bepaald door het vertrouwensniveau tussen OG en ON. Dit is logisch, als er veel vertrouwen is, verloopt het proces sneller om tot een overeenkomst te komen. - De effectiviteit van het wijzigingenproces worden voor <u>75%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er geen of weinig vertrouwen is, dan is de ON alleen uit op meerwerk en contractwijzigingen, terwijl de OG vindt dat het reeds opgenomen is in het contract. Bovendien hebben de partijen dan vaak geen gezamenlijke projectdoelen. Het gevolg is dat elke ingediende wijziging door de ON niet gezien wordt als een contractwijziging. Uiteindelijk komt er een compromis als resultaat uit waar beide partijen niets mee opschieten.	

INTERVIEW VERSLAG #8C

Interview:	Project Drachtsterweg t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	06-10-2014
Tijd:	13.00 – 15.00u
Locatie:	Kantoor Heijmans Rosmalen (Graafsebaan 3)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	05-01-2015
Gevalideerd (DD/MM/JJJJ):	19-01-2015 (automatisch)

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
RD	Rolf Drijfhout van Hooff	Procesmanager	Heijmans	-

2. Antwoorden op de interviewvragen over ‘vertrouwen’	
Betrouwbaarheid bij aanbesteding	
Ik was <u>niet</u> betrokken bij de aanbesteding.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW heeft <u>geen</u> invloed op het gedrag van de partijen, maar redelijkheid en billijkheid uit de UAV-GC 2005 <u>wel</u>. Deze principes hebben betrekking op de grijze gedeelten in het contract. Aan de ene kant gaat het bijvoorbeeld om dingen die niet expliciet beschreven zijn door de OG, maar wel impliciet bedoeld worden en verwacht mogen worden van de ON. Aan de andere kant moet de OG bekijken of de eisen goed in het contract beschreven zijn en of hij het dan ook van de ON redelijkerwijs mag verwachten. Intern worden de principes van redelijkheid en billijkheid gebruikt door de ON om te bepalen of iets redelijk en billijk is t.o.v. het contract en of iets een contractwijziging is. - De gemaakte Samenwerkingsafspraken hebben <u>als het goed is wel</u> invloed op het gedrag van de partijen, want daarvoor maak je afspraken met elkaar. Afspraak is afspraak. Echter, als dingen onder druk komen te staan, dan proberen de partijen vooral de ‘eigen’ belangen beschermen waardoor de openheid tussen de partijen en de focus op het doel minder worden. Een goed project kan je alleen maken als er wederzijds vertrouwen is en als de partijen de gemaakte afspraken durven na te komen. Zo worden de specifieke belangen van de partijen vaak niet open besproken, terwijl als je elkaars belangen kent, je veel meer voor elkaar kan betekenen.	
Projectdoelen	
- De gemaakte Samenwerkingsafspraken worden tot nu toe over het algemeen nagekomen door beide partijen. Dit zijn vrij standaard PSU afspraken. Ik ben niet bij de PSU geweest, maar wel bij de PFU. Het wel of niet nakomen van de afspraken wordt tijdens PFU's besproken. - Als het goed gaat met het project, dan is het voor de partijen makkelijk om zich aan de afspraken te houden. Als het slechter gaat, dan kost het de partijen meer moeite om zich aan de afspraken te houden, terwijl dit dan juist wel nodig is. Zo is het belangrijk dat het informeel overleg niet een verkapt contractoverleg wordt, dat de partijen open blijven communiceren over de eigen standpunten en belangen, dat de partijen focus op het doel blijven houden en dat de partijen samen blijven werken. - Elke twee weken is er informeel overleg met de contract manager (Jörgen) en project manager (Edward) om eventuele problemen van een afstand te bekijken en te bespreken. Op dit moment zijn er wat problemen in het project (o.a. vertraging op het werk), hierdoor neemt de spanning toe en de openheid af tussen de partijen. Dit is te merken tijdens de discussies tussen de partijen. - De ON heeft nadrukkelijk een focus op het doel: er moet een aquaduct gebouwd worden. Ik vind dat de OG niet het doel nastreeft, omdat de OG soms teveel naar het contract verwijst als het gaat om de uitvoeringsmethode. Uiteindelijk komen de partijen er wel uit als er meningsverschillen zijn, maar dit kost heel veel tijd en moeite. Dus ‘focus op het doel’ en ‘tijdigheid’ zijn er niet altijd. - De 1-op-1 overleggen lopen goed. Over het algemeen kan ik het goed vinden met het team van de OG. Afspraken die worden gemaakt, worden daadwerkelijk nagekomen. Dit vind ik één van de belangrijkste dingen m.b.t. vertrouwen. - De doelen m.b.t. het projectresultaat zijn <u>niet</u> afgestemd tussen OG en ON. De doelstellingen van de ON staan in het PMP (eerste versie is opgesteld in de aanbestedingsfase) en zijn afgestemd op het contract, maar niet op het Contractbeheersplan want dit is geen contractdocument. De doelstellingen van de OG staan in het Contractbeheersplan en zijn waarschijnlijk ook afgestemd op het contract want anders is er een mismatch met het contract.	
Communicatie	
- De partijen houden zich over het algemeen aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Deze plannen werken goed. In de basis werken deze plannen goed. Het project is dynamisch en als afwijken of veranderen van deze plannen nodig is, wordt dit gedaan. - Er is veel informeel contact tussen OG en ON via de 2-wekelijkse informele overleggen tussen Edward, André, Jörgen en Rolf om actuele problemen te bespreken en afspraken erover te maken (hier worden geen verslagen van gemaakt), via co-locatie van OG en ON (niet mailen, maar langskomen op de kamer (ON zit boven, OG zit beneden) of tijdens koffiepauzes) en via de PFU's (het project van een afstand bekijken om samenwerkingsissues te bespreken en elkaar persoonlijk te leren kennen).	
Problemen oplossen	
- De OG heeft ervoor gekozen om niet de Raad van Arbitrage (RvA) maar de Voorzieningenrechter in te schakelen voor geschillenbeslechting (volgens Basisovereenkomst art. 18 is par. 47 vervallen), hier heeft de ON <u>geen</u> invloed op gehad (kwestie van ‘take it or leave it’). De ON zal altijd aanraden om naar de Raad van Arbitrage (RvA) te gaan i.p.v. naar de rechtbank. De RvA snapt meer hoe de bouwwereld in elkaar zit waardoor ze een beter oordeel kunnen geven dan een rechter. De rechter kijkt alleen naar het contract en niet naar de achtergrond van de bouw. - Problemen worden langs minnelijke weg opgelost door: reguliere overlegstructuren (o.a. VTW-overleg, voortgangsoverleg en technisch overleg), een escalatiemodel (eerste niveau > voortgangsoverleg > directieoverleg), proberen problemen op het	

laagste niveau op te lossen, tijdig escaleren en samen gezamenlijke problemen op te lossen (meestal zijn dit problemen waarvan niet duidelijk is voor wie de kosten zijn, dit is tevens vaak een discussiepoint). De 'eigen' problemen worden in principe niet samen opgelost, maar het is mogelijk dat bijvoorbeeld de ON een groot probleem alleen kan oplossen door enkele contractwijzigingen door te voeren. Hierdoor wordt het een gezamenlijk probleem, want de ON heeft dan toestemming nodig van de OG. - Betreft het tijdig aankondigen van problemen: 'tijdig' is open voor interpretatie. De meeste problemen worden tijdig aangekondigd, maar sommige worden pas achteraf gemeld. De formele waarschuwingsplicht voor fouten in het contract geldt altijd en bestaat om de OG en de ON te beschermen. - Tot nu toe zijn alle problemen langs minnelijke weg opgelost.
Risicoverdeling - Ik weet <u>niet</u> waarom de aanvullende risicoverdeling tussen OG en ON is toegevoegd aan de Basisovereenkomst (annex 12), hier had de ON <u>geen</u> invloed op. In de aanvulling zijn de risico's specifieker benoemd en zijn de risico's betreft de bodemaspecten iets meer naar de ON verschoven. Ik vraag me af of de OG met de aanvullende risicoverdeling de risico's volledig dekt, want bijvoorbeeld het opnemen van de risico's betreft de bodemgesteldheid in de aanvullende risicoverdeling betekent niet automatisch dat het risico voor de OG betreft de bodemaspecten in de UAV-GC 2005 vervalt. De risico's betreft de bodemgesteldheid blijven gedeeld tussen OG en ON. Het is aan de ON om aannemelijk te maken dat de ON er alles aan gedaan heeft en zijn werkzaamheden heeft afgestemd op de ter beschikking zijnde informatie van de OG over de bodem. - Ik weet <u>niet</u> hoe bepaald is wie de risicodragers is. De OG heeft de risicoverdeling bepaald, hier had de ON <u>geen</u> invloed op. De ON baseert zijn aanbieding op deze risicoverdeling. Risico's die voor de ON zijn, worden afgeprijsd. Volgens de UAV-GC 2005 moeten risico's toebedeeld worden aan de partij die het beste in staat is deze te beheeren. Als risico's zoveel mogelijk doorgeschoven worden naar de andere partij, dan is de kans op problemen groter omdat de risicodragers het risico niet kan beheeren. Archeologische vondst kan bijvoorbeeld beter beheert worden door de OG. Ik vraag me af in hoeverre de ON verantwoordelijk kan zijn voor de toebedeelde risico's, want de aanbestedingsdocumenten van de OG moeten dan wel juist zijn. Als er fouten in deze documenten zitten, kan de OG volgens de principes van redelijkheid en billijkheid niet meer terugvallen op deze risicoverdeling. - Er zijn <u>geen</u> risico's in het contract die gedeeld worden qua aansprakelijkheid door OG en ON. Tijdens het project zijn wel afspraken gemaakt over bepaalde aspecten, zoals de opbrengst door een betere aanpak van de vrijkomende grond m.b.t. de zandwinput 50/50 te verdelen. - De ON wordt beloofd voor het dragen van het risico via een risicoreservering in de inschrijfsom. Echter, om de opdracht binnen te halen door een scherpe aanbieding te doen, is het niet mogelijk om alle risico's af te prijzen.
Continu verbeteren van de relatie - De PSU en de PFU hebben de relatie tussen OG en ON verbeterd. Iedereen deed serieus mee en ik heb de twee meetings positief ervaren. Je krijgt wat meer inzicht in de andere partij (e.g. belangen en standpunten). - De mogelijke verbeterpunten uit de PFU zijn <u>deels</u> aangepakt door ze te bespreken en er afspraken over te maken. De invulling van het D&C contract leidde tot een stevige discussie o.a. over wat de UAV-GC 2005 inhoudt, hoe de OG zich heeft gedragen en had moeten gedragen. M.b.t. dit aspect houdt de OG weinig rekening met de ON. Het meningsverschil over dit aspect is niet opgelost. - Tijdens het project zijn er periodieke PFU's tussen kernteams van de OG en ON ten behoeve van het verbeteren van de relatie.
Overige systemen of processen - Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON. - Aanvulling op 'Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)': integriteit.

3. Antwoorden op de interviewvragen over 'wijzigingen'

Projectdoelen - De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn afgestemd betreft de procedures, maar <u>niet</u> betreft het resultaat. De procedures zijn vastgelegd en de partijen houden zich daaraan. Het doel van de OG 'het minimaliseren van scopewijzigingen' is onmogelijk als het contract fouten bevat, niet alles dekt of niet duidelijk is, waardoor contractwijzigingen noodzakelijk worden om het projectdoel te realiseren. - De doelstellingen van OG en ON m.b.t. risico management zijn afgestemd betreft de procedures, maar <u>niet</u> betreft het resultaat, want de doelstelling van de OG die is opgenomen in de Vraagspecificatie deel 2 ('het identificeren en beheersen van risico's ten behoeve van het beheerst laten verlopen van het ontwerp- en uitvoeringsproces') komt overeen met de standaard doelstelling van de ON voor risico management.
Risico management - De OG en de ON houden zich over het algemeen aan de opgestelde risico management plannen tijdens het project. Deze plannen werken goed. Wat beter kan is het op elkaar afstemmen van de risicodossiers van OG en ON, dit gebeurt wel maar er wordt na het risico-overleg niet veel mee gedaan door OG en ON. - De aanpak van risico's door de ON is grotendeels proactief. Op het moment dat de ON risico's onderkent, is het altijd de doelstelling om preventieve beheersmaatregelen te treffen. Elk risico dat onderkent wordt, probeert de ON dus proactief te beheersen, maar sommige risico's staan niet in het risicodossier. De aanpak van deze risico's is reactief, omdat de ON dan corrigerend bezig is.
Wijzigingsprocedure - De gebruikte VTW-procedure wijkt <u>niet</u> af van de wijzigingsprocedure uit de UAV-GC 2005 (par. 14, 15 en 45). De OG had alleen geëist dat de VTW inclusief geraamd bedrag ingediend moet worden, zodat hij meteen weet om hoeveel geld het gaat. De prijsaanbieding volgt meestal pas later, dit is ook de voorkeur van de ON, want de ON wil eerst een akkoord voor de contractwijziging voordat hij de kosten helemaal uitrekent. - Alle andere sub clausules van par. 14, 15 en 45 uit de UAV-GC 2005 die niet zijn vervallen, zijn wel van toepassing. De automatische acceptatieregeling is niet opgenomen in de VTW-procedure in het PMP, maar geldt formeel gezien altijd. Het komt niet zo vaak voor dat deze regeling gebruikt moet worden, want de OG reageert altijd. Betreft de type wijzigingen, de wijzigingen in de Basisovereenkomst en de Vraagspecificaties worden wel afgehandeld via de wijzigingsprocedure, maar de wijzigingen in

reeds geaccepteerde documenten worden meestal middels afwijkingen vastgelegd. Dit komt o.a. doordat de OG heel veel documenten ter acceptatie heeft gevraagd. Deze werkwijze hebben de partijen met elkaar afgesproken. - De OG en de ON houden zich aan de opgestelde VTW-procedure tijdens het project. Er zijn geen problemen met deze procedure. - Ik weet <u>niet</u> waarom de aanvulling met de extra controle- en waarschuwingsplicht voor de ON in de Basisovereenkomst (annex14) is toegevoegd. Hier had de ON <u>geen</u> invloed op. - Voor de OG heeft de aanvulling wel een toegevoegde waarde, maar voor de ON niet echt, want de aanvulling legt een zwaardere controle- en waarschuwingsplicht op aan de ON. De documenten worden wel gecontroleerd door de ON, maar niet extra gecontroleerd. De ON heeft altijd een waarschuwingsplicht bij tegenstrijdigheden en mag de OG nooit doelbewust aanvullende kosten laten maken in het geval dat de ON weet dat er een fout zit in het contract. De aanvulling is een beetje tegenstrijdig, want alle documenten van de ON worden geacht goed te zijn en moeten tevens de documenten van de OG controleren op fouten. - De aanpak van wijzigingen door de ON is grotendeels proactief, want sommige wijzigingen treden op als ze al geweest zijn. Meestal wordt dit wel aangegeven, maar voordat de hele wijzigingsprocedure doorlopen is, is de wijziging al uitgevoerd. De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:	
9. Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10. Het wijzigingsvoorstel opnemen in een logboek	X
11. De prioriteit van de wijziging bepalen	X
12. Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	X
13. De impacts van de verschillende wijzigingsopties bepalen	1/2
14. (Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15. Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16. Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	X
5. De uitvoering van de wijziging monitoren en documenteren.	X
Opmerkingen: Bij 11, wordt gedaan als snellere besluitvorming kan en nodig is. Bij 12-13, er zijn niet altijd meerdere opties. Bij 14, de snelheid van de besluitvorming hangt af van de prioriteit van de wijziging en van de mandaatregelingen bij OG (gelaagd met Jörgen, Edward en Sieds) en ON (André mag alles tekenen (vervanger Eric Post ook), Rolf mag alleen VTW's zonder financiële impact tekenen). Bij 15, meestal gaat dit indirect via de projectleiders.	
Continu verbeteren	
- Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Met de audits worden alleen de procedures beoordeeld. De wijzigingsprocedure was ook beoordeeld, maar er was weinig op aan te merken want iedereen werkt volgens de plannen in het PMP. Er worden geen evaluaties gedaan van het proces, want de processen (i.e. de inhoudelijke discussies) zijn steeds verschillend per wijziging. - De performance van de risico management processen wordt tijdens het project gemeten en bijgestuurd door middel van de audits. Er wordt gelet op of de procedures gevolgd worden en effectief zijn en of de ON de dingen doet die van tevoren afgesproken waren. Als dit niet goed genoeg gaat, moet dit afgestemd worden.	
Overige systemen of processen	
- Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingenproces: apart en periodiek VTW-overleg en informele afstemming over VTW (tijdens overleg, mailen, bellen of langskomen, dit werkt efficiënter). - Aanvulling op 'Risico management systeem': er zijn inderdaad beheersmaatregelen die een contractwijziging bevatten, maar bij andere processen treden veel meer wijzigingen op, zoals bij het voorbereidingsproces en het verificatieproces. Het is mogelijk de ON een eis van de OG niet kan verifiëren zoals die gesteld is, waardoor een contractwijziging noodzakelijk is om de eis toch te verifiëren. Dit wordt dan eerst intern afgehandeld als een afwijking. Vervolgens wordt deze gecorrigeerd als het mogelijk is of er wordt een VTW voor ingediend.	

4. Antwoorden op de extra interviewvragen over ‘vertrouwen’ en ‘wijzigingen’ (losstaand van het project)	
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):	
C	1. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
	2. Veel communicatie en interacties
C	3. Gedeelde projectdoelen
C	4. Redelijk gedrag
	5. Emotionele investeringen
	6. Duidelijk communicatiesysteem
C	7. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
	8. Samen problemen oplossen
	9. Systeem voor continu verbeteren van de relatie
	10. Betrouwbaarheid: cultuur, beleid
C	11. Eerlijke/proportionele risicoverdeling
	12. Problemen oplossen op het eerste niveau
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):	
C	1. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
C	2. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
	3. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
C	4. Apart en periodiek VTW-overleg
C	5. Vroegtijdige waarschuwingsplicht
	6. Informele afstemming over VTW
	7. Adequate documentatie van de wijziging
	8. Eerlijke/proportionele risicoverdeling
C	9. Risico management systeem
	10. Leren van wijzigingen en kennis hiervan delen
Invloed vertrouwen op wijzigingenproces	
- De efficiëntie van het wijzigingenproces worden voor <u>80%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er geen vertrouwen is, dan wordt het proces heel omslachtig. De OG gaat dan heel veel vragen en randvoorwaarden stellen aan de ON om o.a. alles kloppend te hebben, alles uitgewerkt te hebben en alles te weten (wat, wanneer, hoe etc). Het kost beide partijen veel tijd en energie om dit allemaal af te stemmen. Als er vertrouwen is, dan heeft de OG vertrouwen in de ON dat hij een redelijke prijs heeft gekregen en dat de ON maakt wat hij wil. - De effectiviteit van het wijzigingenproces worden voor <u>0-30%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er geen vertrouwen is, kan het nog steeds een heel effectief proces zijn mits de wijzigingsprocedure goed is opgesteld. Echter, de samenwerking wordt dan vele malen moeilijker, want de partijen gaan van alles wantrouwen, bijvoorbeeld de wijzigingsprocedure en elkaars kennis. Er moet dus altijd wel een basis van vertrouwen zijn.	

INTERVIEW VERSLAG #9C

Interview:	Project Drachtsterweg t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	01-10-2014
Tijd:	10.00 – 12.00u
Locatie:	Kantoor Heijmans Nijkerk (Nijverheidsstraat 38)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	05-01-2015
Gevalideerd (DD/MM/JJJJ):	07-01-2015

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
JS	Jaap Springelkamp	Wijzigingenbeheerder	Heijmans	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
Ik was <u>niet</u> betrokken bij de aanbesteding.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW vormen een grijs gebied. Er zijn vaak discussies tussen de OG en ON over de interpretatie van deze principes. - Vanuit de ON is het vaak gunstig zo min mogelijk kosten te maken voor een goed bedrijfsresultaat. - Het is beter als het contract zwartwit is, want een zwartwit contract laat minder ruimte voor discussie. - Redelijkheid en billijkheid in het contract moeten zo duidelijk mogelijk gedefinieerd worden en er moet een toetsingskader voor zijn. - De gemaakte Samenwerkingsafspraken hebben <u>niet direct</u> invloed op het gedrag van de partijen. Gedrag van mensen wordt voornamelijk bepaald door hun karakters en kan niet aangepast worden door dergelijke afspraken. Echter, door dingen via (informeel) overleg in plaats van via de mail te communiceren, komt de boodschap wel wat zachter aan.	
Projectdoelen	
- De gemaakte Samenwerkingsafspraken worden tot nu toe over het algemeen nagekomen door beide partijen. - Zo gaat bijvoorbeeld niet alle communicatie via de mail, maar worden aspecten eerst (informeel) besproken. Iedere twee weken is er overleg tussen OG en ON over contractwijzigingen. - De afspraak 'tijdigheid' wordt niet altijd nagekomen voor aspecten buiten de contractwijzigingen om. Sommige kleine contractwijzigingen waarvan de prioriteit niet hoog is (e.g. geen financiële consequenties) blijven weleens liggen, maar de grote wijzigingen niet. - De doelen m.b.t. het projectresultaat zijn wel besproken tijdens de PSU, maar deze zijn lastig af te stemmen tussen OG en ON, omdat deze tegenstrijdig zijn. De OG wil zo min mogelijk geld uitgeven en het maximale krijgen voor wat hij uitgeeft, terwijl de ON zo veel mogelijk geld wil verdienen met minimale inspanning.	
Communicatie	
- De partijen houden zich over het algemeen aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Het team van de ON hield zich voor 90-95% aan het PMP versie 1.0. Inmiddels is deze upgedate naar versie 2.0 om enkele aspecten te verbeteren. Het PMP werkt goed, want deze wordt vaker gebruikt en sluit aan op het bedrijfsproces. Het PMP bevat slechts enkele projectspecifieke aspecten. - In het begin van het project hield de OG zich niet aan de VTW-procedure uit het PMP versie 1.0, wat leidde tot onenigheid tussen de partijen. De OG wilde dat de VTW's inclusief offerte ingediend moeten worden. De ON was van mening dat het feit of iets een wijziging is ten opzichte van het contract niet bepaald kan worden door de consequenties van de betreffende wijziging. De hoogte van de financiële consequentie mag geen invloed gaan uitoefenen op de vraag of iets wel of geen wijziging is. In veel gevallen gebeurt het wel dat de financiële consequentie de contractuele discussie gaat beïnvloeden. - Los van voorgaande kost het de ON veel tijd (en ook kosten) om een offerte op te stellen. Als compromis is afgesproken om waar mogelijk een raming te benoemen, dit is slechts een bedrag en geen bijlage of document. Deze aanpassing in de wijzigingsprocedure is meegenomen in het PMP versie 2.0. - Er is veel informeel contact tussen OG en ON via de maandelijkse informele meetings tussen Edward en André en via de PFU's. Als het gaat om contractwijzigingen, is er vooral veel contact via de mail in plaats van de telefoon, omdat deze methode beter is om contractuele zaken vast te leggen.	
Problemen oplossen	
- Ik weet <u>niet</u> waarom de OG ervoor gekozen heeft om niet de Raad van Deskundigen (RvD) maar de Voorzieningenrechter in te schakelen voor geschillenbeslechting (Basisovereenkomst art. 18). Dit zal René wel weten. De OG heeft de Basisovereenkomst opgesteld, hier heeft de ON <u>geen</u> invloed op gehad. De ON had wel via de Nota van Inlichtingen vragen erover kunnen stellen, maar dit is niet gedaan. Conflicten moeten wel heel erg zijn voordat ze bij de RvD of de rechter terecht komen. - Problemen worden langs minnelijke weg opgelost door: apart VTW-overleg, wijzigingen tijdig aan te kondigen aan Jörgen, meningsverschillen (i.e. standpunten haaks op elkaar) direct opzij leggen en escaleren waardoor de relatie goed blijft (eerste niveau > Edward en André > Sieds en directeur van Heijmans) en samen problemen op te lossen (contractuele en technische zaken staan los van elkaar en worden behandeld in twee verschillende overleggen). - Er is afgesproken dat de oplossing van een geëscaleerd meningsverschil (e.g. 50/50 delen) automatisch geaccepteerd wordt op de lagere niveaus om daar de relatie tussen de partijen goed te houden. - Rug-tegen-de-muur situaties proberen we te voorkomen, maar komen toch voor door de overlap van ontwerp en uitvoering. - Tot nu toe zijn alle problemen langs minnelijke weg opgelost. Er zijn wel een aantal VTW's geëscaleerd naar Edward en André en een aantal andere issues zijn geëscaleerd naar Sieds en de directeur van Heijmans.	

Risicoverdeling	
- De aanvullende risicoverdeling tussen OG en ON is <u>waarschijnlijk</u> toegevoegd aan de Basisovereenkomst (annex 12) omdat de OG zich probeerde in te dekken. Dit komt vaker voor in het contract in de vorm van veel randvoorwaarden of restricties. - De OG heeft de risicoverdeling in het contract bepaald. Als er tijdens het project een onverwachte risico optreedt, zal de OG in discussie gaan met de ON om te bepalen wie verantwoordelijk is voor het risico. - De risicoverdeling in de UAV-GC 2005 is <u>niet</u> zwartwit. In het project was er bijvoorbeeld een probleem met een veel hardere bodem dan verwacht tijdens het ontgraven van de bouwkuip en het aanbrengen van de trekpalen. Tijdens de aanbesteding was het niet mogelijk voor de ON en de andere aannemers om uitgebreid bodemonderzoek te doen. Daarom moesten zij vertrouwen op de geotechnische informatie van de OG. Hieruit kon niet worden afgeleid dat de bodem zo hard zou zijn. De OG en ON zijn het oneens met elkaar over de verantwoordelijkheid van het risico. Vaak ontstaan meningsverschillen als het om veel geld gaat. - Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. - De ON wordt beloond voor het dragen van het risico via een risicoreservering in de inschrijfsom en via de VTW's. Echter, vanwege de recessie staat de bouwsector onder druk en is het belangrijk om het werk scherp aan te kunnen bieden. Daarom wordt er gekeken of er alternatieve bouwoplossingen zijn zodat de risicoreservering verlaagd kan worden. De risicoreservering is niet het eerste, maar ook niet het laatste waarop bezuinigd wordt.	
Continu verbeteren van de relatie	
- De PSU en de PFU hebben naar mijn mening de relatie tussen OG en ON <u>niet</u> verbeterd. Vertrouwen tussen de partijen wordt niet gecreëerd door zulke meetings. 80% van het vertrouwen tussen de partijen is afhankelijk van de karakters van de mensen en de rest van de 'inhoud' van de mensen zoals de vakinhoudelijke kennis. Door de PSU ga je elkaar wel makkelijker opzoeken om dingen te bespreken, maar het vertrouwen ontstaat na de meeting pas. - De mogelijke verbeterpunten uit de PFU zijn <u>wel</u> aangepakt maar niet allemaal opgelost. - Het was van tevoren al bekend dat ontwerp en uitvoering kort op elkaar zouden zitten. Hierdoor worden sommige processen (e.g. eerst ontwerp afronden en daarna pas werkplan schrijven) niet nagekomen en kan het team van de ON het werk niet optimaal uitvoeren. Het probleem kan opgelost worden door de uitvoering uit te stellen, maar dit zal nadelig zijn voor de ON. - Het omgevingsmanagement is flink verbeterd. - De onenigheid over de invulling van het D&C contract is <u>niet</u> opgelost. De OG vindt dat het een functioneel contract is, maar dit vindt de ON niet. Voor veel aspecten die de ON functioneel wil invullen is namelijk reeds een oplossing bedacht door de OG, dit is tegenstrijdig met de gedachte achter de functionele D&C contracten. - De toetsers en de ontwerpers hebben afspraken gemaakt om de acceptatieprocedure efficiënter te maken. - Tijdens het project zijn er regelmatig PFU's tussen OG en ON ten behoeve van het verbeteren van de relatie. Ik ben hier echter <u>niet</u> bij betrokken.	
Overige systemen of processen	
Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON: respecteren van de 'eigen' projectdoelen (e.g. maximale kwaliteit voor de OG en minimale winst voor de ON).	

3. Antwoorden op de interviewvragen over 'wijzigingen'

Projectdoelen

- De doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn niet afgestemd betreft het resultaat. De OG heeft dit zelf in de hand door middel van het contract. Als het contract goed is voorbereid (i.e. functionele eisen duidelijk beschreven en geen gaten in het contract), dan zijn er alleen contractwijzigingen vanuit de OG. Bovendien bepaalt de OG zelf of hij de functionele invulling door de ON accepteert of niet. Als de OG het niet accepteert, kan dit leiden tot een VTW.
- De doelstellingen van OG en ON m.b.t. risico management zijn waarschijnlijk wel afgestemd betreft het resultaat. De risico managers van OG en ON zullen hier afspraken over hebben gemaakt. Ik ben hier niet direct bij betrokken geweest.

Risico management

- De OG en de ON houden zich over het algemeen aan de opgestelde risico management plannen tijdens het project. Ik ben hier echter niet actief bij betrokken. Het risicodossier van de ON wordt regelmatig upgedate en ik pak de risico's aan waarvoor ik verantwoordelijk ben.
- De aanpak van risico's door de ON is grotendeels proactief, want hier hebben wij zelf baat bij. Het risicodossier bevat veel risico's, deze worden niet allemaal proactief aangepakt. Vooral de grootste risico's met de meeste impact worden proactief aangepakt, omdat met deze de grootste winst is te halen.

Wijzigingsprocedure

- De gebruikte VTW-procedure wijkt niet af van de wijzigingsprocedure uit de UAV-GC 2005 (par. 14, 15 en 45). Er wordt alleen een raming toegevoegd aan de VTW omdat de OG dit heeft geëist. De OG wil met de raming bepalen of hij verder wil met de wijziging of niet. Het bepalen of iets een contractwijziging is, moet niet afhangen van de prijs.
- Alle sub clausules van par. 14, 15 en 45 uit de UAV-GC 2005 die niet zijn vervallen, zijn wel van toepassing, behalve de automatische acceptatieregeling.
- De OG en de ON houden zich aan de opgestelde VTW-procedure tijdens het project. De efficiëntie van deze VTW-procedure hangt af van de communicatie (i.e. de manier hoe je de VTW afstemt), de prijs van de VTW en de timing van het bekendmaken van de prijs. Ten behoeve van de efficiëntie hebben de partijen afgesproken om een conceptversie van de VTW per email te sturen.
- De aanvulling met de extra controle- en waarschuwingsplicht voor de ON in de Basisovereenkomst (annex14) is waarschijnlijk toegevoegd omdat de OG de ON medeplichtig wil maken voor fouten in de verstrekte documenten door de OG.
- De waarschuwingsplicht uit par. 4.7 is vaag met betrekking tot tegenstrijdigheden in de Vraagspecificatie die het gevolg zijn van een verschil in interpretatie van de functionele eisen. Voor zulke tegenstrijdigheden kan de ON niet waarschuwen, omdat hij er geen tegenstrijdigheid in ziet.
- De standaard en de aanvullende waarschuwingsplicht hebben geen directe relatie met de wijzigingsprocedure.
- De aanpak van wijzigingen door de ON is grotendeels proactief. De ON is actief bezig met het kritisch beoordelen of iets wel of niet tot de scope behoort. Dit moet proactief gebeuren, want aspecten die buiten de scope vallen, zullen anders tot een verlies voor de ON leiden.

De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:		
9.	Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10.	Het wijzigingsvoorstel opnemen in een logboek	X
11.	De prioriteit van de wijziging bepalen	-
12.	Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	X
13.	De impacts van de verschillende wijzigingsopties bepalen	-
14.	(Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15.	Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16.	Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	X
6.	De uitvoering van de wijziging monitoren en documenteren.	X
Opmerkingen: Bij 12, deze stap staat niet zwart op wit. Bij 13, meestal is er maar één variant. Bij 14, de snelheid van besluitvorming hangt af van de prioriteit en de beschikbaarheid van mensen.		
Continu verbeteren		
- Tijdens het project worden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Dit gebeurt alleen voor afwijkingen. Leren van wijzigingen is vooral van belang voor de OG, want de opkomst van wijzigingen hangt direct samen met de eisen in de Vraagspecificatie. - Uit een afstudeeronderzoek over het voorkomen van scopewijzigingen blijkt dat het niet gunstig is om het contract dusdanig waterdicht te maken in de contractvoorbereiding zodat er geen contractwijzigingen zullen optreden, omdat de extra kosten voor het opstellen van een waterdicht contract hoger zijn dan de verliezen tijdens het project als gevolg van niet onder concurrentie uitbesteden. Als je tijd en geld na de gunning inzet om scopewijzigingen door te voeren, dan is er geen concurrentie op de prijs van de scopewijziging en kan de ON vrij risicoloos een aanbidding doen. Als je tijd en geld vóór de gunning inzet om het contract waterdicht te krijgen, dan is er meer concurrentie op de prijs van het gehele project en zal de prijs scherper zijn. Kortom, 'extra kosten contractvoorbereiding' zijn hoger dan 'totale prijs niet onder concurrentie minus totale prijs wel onder concurrentie'. - Ik weet <u>niet</u> of de performance van de risico management processen tijdens het project wordt gemeten en bijgestuurd.		
Overige systemen of processen		
Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingenproces: apart VTW-overleg.		

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)		
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):		
C	1. Respecteren van de 'eigen' projectdoelen	
C	2. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)	
	3. Redelijk gedrag	
	4. Samen problemen oplossen	
	5. Problemen oplossen op het eerste niveau	
	6. Duidelijk communicatiesysteem	
	7. Veel communicatie en interacties	
	8. Betrouwbaarheid: cultuur, beleid	
	9. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)	
	10. Emotionele investeringen	
	11. Eerlijke/proportionele risicoverdeling	
	12. Systeem voor continu verbeteren van de relatie	
	13. Gedeelde projectdoelen	
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):		
C	1. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren	
C	2. Adequate documentatie van de wijziging	
C	3. Apart VTW-overleg	
C	4. Vroegtijdige waarschuwingsplicht	
	5. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin	
C	6. Eerlijke/proportionele risicoverdeling	
	7. Risico management systeem	
	8. Gedeelde projectdoelen voor wijzigingenbeheer en risico management	
	9. Leren van wijzigingen en kennis hiervan delen	
Invloed vertrouwen op wijzigingenproces		
- De efficiëntie van het wijzigingenproces worden voor <u>50%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er geen of weinig vertrouwen is, moet er meer uitgelegd worden en duurt het langer om de wijziging te beoordelen door de OG. De manier van uitleggen (mondeling of per brief) is van belang hierbij en kan gebruikt worden om het proces efficiënter te maken. Echter, het beoordelen of iets een contractwijziging is of niet is onafhankelijk van vertrouwen tussen de partijen. - De effectiviteit van het wijzigingenproces worden voor <u>0%</u> bepaald door het vertrouwensniveau tussen OG en ON. Het beoordelen of iets een contractwijziging is of niet is onafhankelijk van vertrouwen tussen de partijen. Bovendien zal een OG niet zomaar contractwijzigingen gunnen aan de ON, omdat de OG deze ook intern moet verantwoorden.		

INTERVIEW VERSLAG #10C

Interview:	Project Drachtsterweg t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	01-10-2014
Tijd:	15.00 – 17.00u
Locatie:	Kantoor Heijmans Rosmalen (Graafsebaan 67)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	05-01-2015
Gevalideerd (DD/MM/JJJJ):	06-01-2015

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
RR	René Rozendal	Contractadviseur	Heijmans	-
Opmerking: René Rozendal heeft de interviewvragen op persoonlijke titel beantwoord.				

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
- De uitsluitingsgronden zijn standaard en de minimum technische eisen refereren naar het verleden en zijn voor veel projecten hetzelfde, maar beide geven <u>wel</u> een goede indicatie voor de OG om de betrouwbaarheid (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) van de aannemers te bepalen. - Ik weet <u>niet</u> of er andere factoren van invloed waren op de voorselectie van de aannemers. Ik ben hier <u>niet</u> direct bij betrokken. Een aparte afdeling bij Heijmans bestaande uit drie man doet de pre-kwalificaties en voorselecties voor alle projecten. Deze zijn meestal grotendeels gestandaardiseerd, maar er worden ook wel projectspecifieke eisen gesteld. Als grote speler in de bouwsector heeft Heijmans nooit echt een probleem om te voldoen aan de selectiecriteria. - Op persoonlijk niveau zijn er tijdens de aanbesteding <u>geen</u> eisen gesteld aan de werknemers van de ON. Dit mag ook niet volgens de aanbestedingsregels. Alleen Model K (Verklaring bestuurder omtrent rechtmatigheid inschrijving) moest ingevuld worden. Bij Best Value Procurement worden er wel persoonlijke interviews gehouden. Ik was <u>niet</u> betrokken bij de individuele informatie-uitwisselingsrondes.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het BW heeft <u>geen</u> invloed op het gedrag van de partijen. 9/10 mensen in het project zullen het BW niet kennen. Het is vanzelfsprekend dat men rekening moet houden met de belangen van de wederpartij. - De gemaakte Samenwerkingsafspraken zullen <u>wel</u> invloed hebben op het gedrag van de partijen. Deze afspraken zijn een uitwerking van redelijkheid en billijkheid, maar ze zijn niet opgesteld op basis van het BW. Zulke afspraken vormen een goede leidraad voor de samenwerking, maar ze zijn wel onderhevig aan plaats, tijd en situatie.	
Projectdoelen	
- Ik weet <u>niet</u> of de gemaakte Samenwerkingsafspraken tot nu toe nagekomen worden door beide partijen, want ik ben hier <u>niet</u> direct bij betrokken. Over het algemeen, partijen maken meestal samenwerkingsafspraken tijdens een PSU en als partijen zulke afspraken hebben gemaakt, dan is de intentie wel om de afspraken na te komen. Samenwerkingsafspraken vormen een goede leidraad voor de samenwerking, maar de interpretatie van de afspraken (e.g. openheid) kan per project en per partij verschillend zijn. - Ik weet <u>niet</u> of de doelen m.b.t. het projectresultaat zijn afgestemd tussen OG en ON, want ik ben hier <u>niet</u> direct bij betrokken.	
Communicatie	
- De partijen houden zich aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Als dit contractuele afspraken zijn, moeten deze hoe dan ook nagekomen worden. - In projecten worden weleens PFU's gehouden waarbij de OG en ON informeel contact hebben met elkaar. Zulke meetings worden gebruikt om te reflecteren op de gemaakte afspraken tussen de partijen.	
Problemen oplossen	
- De OG heeft ervoor gekozen om de Raad van Deskundigen (RvD) niet in te schakelen voor geschillenbeslechting (Basisovereenkomst art. 18), <u>waarschijnlijk</u> omdat de procedure (o.a. het samenstellen van de raad) belastend is, terwijl het niet duidelijk is of het waarde toevoegt. De ON heeft <u>geen</u> invloed gehad op deze keuze. De ON kan er wel vragen over stellen, maar vaak gaat het om 'slikken of stikken' contracten. Als een aannemer een voorwaarde stelt, loopt hij de kans om uitgesloten te worden. Bovendien zal een OG het contract meestal niet aanpassen voor een aannemer. Over het algemeen, in 9/10 projecten wordt de RvD <u>niet</u> ingeschakeld. - De OG heeft gekozen voor de Voorzieningenrechter ter beslechting van geschillen, <u>waarschijnlijk</u> omdat de RvD technisch inhoudelijk naar de zaken kijkt en de rechter alleen juridisch, en vanwege de snelheid van de procedure. Voor een snelle procedure kon de OG ook terecht bij de Raad van Arbitrage. - Door de keuze voor de Voorzieningenrechter in het contract (Basisovereenkomst art.18) zijn de partijen verplicht alle geschillen voor te leggen aan de Voorzieningenrechter en niet aan bijvoorbeeld de Raad van Arbitrage. - Problemen worden langs minnelijke weg opgelost door: over het algemeen, in discussie te blijven met de OG en argumenten uit te wisselen om elkaar proberen te overtuigen. - Tot nu toe zijn alle problemen langs minnelijke weg opgelost. Over het algemeen kost het voor beide partijen veel geld om naar de rechter te stappen, daarom is het belangrijk om problemen langs minnelijke weg op te lossen.	
Risicoverdeling	
- De aanvullende risicoverdeling tussen OG en ON is door de OG toegevoegd aan de Basisovereenkomst (annex 12) om de risico's gedetailleerder te beschrijven, nieuwe risico's toe te voegen en om risico's door te schuiven naar de ON. - De OG heeft de risicoverdeling bepaald, de ON heeft hier <u>geen</u> invloed op gehad. De ON kan er wel vragen over stellen, maar vaak gaat het om 'slikken of stikken' contracten. Bovendien krijgt de ON vaak als antwoord 'NEE' als de OG wordt gevraagd om de risico's conform de UAV-GC 2005 te verdelen. De risicoverdeling is in strijd met de Aanbestedingswet 2012. Sinds 1 april 2013	

horen partijen de UAV-GC 2005 integraal toe te passen zoals het is opgesteld. In dit project is echter het ARW2005 van toepassing. ▪ Er zijn <u>geen</u> risico's die gedeeld worden qua aansprakelijkheid door OG en ON. ▪ De ON wordt beloond voor het dragen van het risico via een eventuele risicoreservering in de inschrijfsom. De risico manager gaat na hoe het risico beheerst kan worden en bepaalt of deze wel of niet meegenomen moet worden in de inschrijfsom.
Continu verbeteren van de relatie
▪ Ik ben <u>niet</u> betrokken geweest bij de PSU en PFU. Over het algemeen zullen een PSU en een PFU de relatie tussen OG en ON verbeteren, omdat de partijen dan de gelegenheid krijgen om te kunnen zeggen wat ze van bepaalde aspecten vinden. ▪ Ik weet <u>niet</u> of er tijdens het project een systeem of maatregelen zijn afgesproken tussen OG en ON ten behoeve van het verbeteren van de relatie.
Overige systemen of processen
▪ Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON. ▪ Aanvulling op 'veel communicatie en interacties': open communiceren.

3. Antwoorden op de interviewvragen over 'wijzigingen'

Projectdoelen	
▪ Ik weet <u>niet</u> of de doelstellingen van OG en ON m.b.t. VTW's en meerwerk zijn afgestemd. ▪ Ik weet <u>niet</u> of de doelstellingen van OG en ON m.b.t. risico management zijn afgestemd, maar de doelstelling van de OG ('het identificeren en beheersen van risico's ten behoeve van het beheerst laten verlopen van het ontwerp- en uitvoeringsproces') ligt wel erg voor de hand. Beide partijen hebben er belang bij om risico's te beheersen, ongeacht wie verantwoordelijk is voor het risico.	
Risico management	
▪ Ik weet <u>niet</u> of de OG en de ON zich houden aan de opgestelde risico management plannen tijdens het project. Ik ben hier <u>niet</u> direct bij betrokken. ▪ Ik weet <u>niet</u> hoe proactief de aanpak van risico's is door de OG en de ON. Ik ben hier <u>niet</u> direct bij betrokken.	
Wijzigingsprocedure	
▪ De gebruikte VTW-procedure wijkt af van de wijzigingsprocedure uit de UAV-GC 2005 (par. 14, 15 en 45), omdat de OG dit heeft geëist. De OG bepaalt de VTW-procedure en is <u>waarschijnlijk</u> afgeweken van de UAV-GC 2005 om bepaalde risico's te verlagen. ▪ Alle andere sub clausules van par. 14, 15 en 45 uit de UAV-GC 2005 die niet zijn vervallen, zijn wel van toepassing. Volgens de Aanbestedingswet 2012 is het laten vervallen van sub clausules niet toegestaan. Echter, in dit project is het ARW2005 van toepassing. ▪ Ik weet <u>niet</u> of de OG en de ON zich houden aan de opgestelde VTW-procedure tijdens het project. Over het algemeen, als de VTW-procedure in het contract staat, moet de ON zich daaraan houden. ▪ De aanvulling met de extra controle- en waarschuwingsplicht voor de ON in de Basisovereenkomst (annex14) verplicht de ON om alles wat van de OG komt te controleren en is een verzwaring van de reeds aanwezige waarschuwingsplicht uit de UAV-GC 2005. Het gaat namelijk om een waarschuwing voor alle fouten en niet alleen de klaarblijkelijke. ▪ Ik weet <u>niet</u> hoe proactief de aanpak van wijzigingen is door de OG en de ON. Ik ben hier <u>niet</u> direct bij betrokken, maar over het algemeen kan je contractwijzigingen niet laten liggen. ▪ Ik weet <u>niet</u> welke van de volgende processen deel uitmaken van de VTW-procedure en uitgevoerd worden door ON of OG. Ik ben hier <u>niet</u> direct bij betrokken.	
9.	Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen
10.	Het wijzigingsvoorstel opnemen in een logboek
11.	De prioriteit van de wijziging bepalen
12.	Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.
13.	De impacts van de verschillende wijzigingsopties bepalen
14.	(Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.
15.	Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.
16.	Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.
5.	De uitvoering van de wijziging monitoren en documenteren.
Opmerkingen:	
Continu verbeteren	
▪ Ik weet <u>niet</u> of er tijdens het project 'lessons learned' gecreëerd worden voor wijzigingen. Ik zie de nut van het delen van de kennis tussen de OG en ON hiervan niet in. ▪ Ik weet <u>niet</u> of de performance van de risico management processen tijdens het project wordt gemeten en bijgestuurd. Over het algemeen worden er processen afgesproken tussen de partijen. Deze worden toegepast, daarna wordt er gekeken wat er efficiënter kan.	
Overige systemen of processen	
▪ Andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingenproces: vroegtijdig escaleren ▪ Aanvulling op 'vroegtijdige waarschuwingsplicht': vroegtijdig melden (ook al is de impact nog niet in zicht). ▪ Aanvulling op 'adequate documentatie van de wijziging': de onderbouwing van de wijziging is hierbij belangrijk	

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)	
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen):	
C	1. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
C	2. Duidelijk communicatiesysteem
C	3. Problemen oplossen op het eerste niveau
C	4. Redelijk gedrag
C	5. Samen problemen oplossen
C	6. Eerlijke/proportionele risicoverdeling
	7. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
	8. Systeem voor continu verbeteren van de relatie
	9. Veel communicatie en interacties
	10. Betrouwbaarheid: cultuur, beleid
	11. Emotionele investeringen
	12. Gedeelde projectdoelen
Rangschikking van meest belangrijkste systemen of processen voor een effectief en efficiënt wijzigingenproces (C = in contract opnemen):	
C	1. Eerlijke/proportionele risicoverdeling
C	2. Risico management systeem
	3. Adequate documentatie van de wijziging
	4. Vroegtijdige waarschuwingsplicht (=melden)
C	5. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
C	6. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
	7. Vroegtijdig escaleren
	8. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
	9. Leren van wijzigingen en kennis hiervan delen
Invloed vertrouwen op wijzigingenproces	
- De efficiëntie van het wijzigingenproces worden voor <u>60%</u> bepaald door het vertrouwensniveau tussen OG en ON. Een goede onderbouwing van de contractwijziging is essentieel voor een efficiënt wijzigingenproces. Echter, het is voor de ON niet altijd mogelijk om snel een compleet beeld te krijgen van alle kosten van de wijziging. Om de wijziging toch snel af te kunnen handelen, is het van belang dat de OG erop moet vertrouwen dat de onderbouwing van de wijziging (kosten, tijd etc.) juist is. - De effectiviteit van het wijzigingenproces worden voor <u>40%</u> bepaald door het vertrouwensniveau tussen OG en ON. Als er geen vertrouwen is, kom je niet tot het eindresultaat. De OG zal bijvoorbeeld zeggen dat het geen contractwijziging is of dat ie niet goed is onderbouwd. Bovendien zal het conflict sneller geëscaleerd worden naar de rechter als er geen vertrouwen is tussen de partijen.	

28. Drachtsterweg: Assessment data

28.1 The Dutch culture

Power Distance Index (PDI) score 38 (L)

In small power distance cultures, all should have equal rights, parties will always negotiate, parties treat all business partners and potential business partners equally, decisions to deceive, trust, and forgive are not influenced by the other party's status, and trust is equally important in every relationship, regardless of the other party's status (Hofstede et al., 2010, pp. 72, 76, 83; Verwaart, 2011, pp. 19, 114, 118).

Individualism versus Collectivism (IDV) score 80 (VH)

In individualistic cultures, parties feel free to do business with any party, negotiate prior to the formation of a relationship, only pursue their own personal interests, depend on their personal judgment and will be more careful to trust, and show distrust as it is. The thresholds for opportunistic behaviour, trust and forgiveness are based on personal relations and the personal interests in these relations (Hofstede et al., 2010, pp. 113, 124, 130; Verwaart, 2011, pp. 19, 104-108).

Masculinity versus Femininity (MAS) score 14 (VL)

In feminine/co-operation oriented cultures, building relationships is important, focus is on good intentions rather than on performance, trust implies intrinsic trust (i.e. trust that accepts vulnerability), implicit trust is high and cheaters are looked down upon (Hofstede et al., 2010, pp. 155, 170, 180; Verwaart, 2011, pp. 18, 90-91).

Uncertainty Avoidance Index (UAI) score 53 (M)

In uncertainty avoiding cultures, parties express their emotions and aggression, only take known risks, need rules to trust, are hesitant to do business with new partners and do not trust them, and have a low deceit threshold towards strangers. Whereas in uncertainty tolerant cultures, parties suppress their emotions and aggression, are willing to take unknown risks, do not need rules to trust, are not hesitant to do business with new partners and do not particularly distrust them, and may be tempted to do deceit in order to make extra profit (Hofstede et al., 2010, pp. 203, 208, 217, 223; Verwaart, 2011, pp. 20, 132-135).

Long-Term Orientation versus Short-Term Normative Orientation (LTO) score 67 (H)

In long-term oriented cultures, parties will not put a relationship with a business partner at stake by deceiving, value their relationships, focus on building a strong market position, and avoid the risk of damaging their relationships (Hofstede et al., 2010, pp. 203, 208, 217, 223; Verwaart, 2011, pp. 20, 132-135).

Indulgence versus Restraint (IND) score 68 (H)

In indulgent cultures, parties have a perception of personal life control, have less moral discipline, and have a positive attitude (Hofstede et al., 2010, pp. 291, 297).

28.2 Assessment of trust in the project

Table 104: Assessment model for trust on project Drachtsterweg

Objective	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)	
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	1.5
			(2) Seek party with similar culture/policy	3	1.5
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	3
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	2.5
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	1.5
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	2
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	2
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	2
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	2
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	2
TOTAL LEVEL OF TRUST RELATIONSHIP			2.91	2	

(1+2) Trustworthiness (ability, integrity and predictability)

Main findings:

- A. According to the Selection Guideline (Provincie Fryslân, 2012c, pp. 6-12), the contract was put out to European tender and the restricted procurement procedure conforming the Public Works Procurement Regulations 2005 (ARW 2005) was applied, which consisted of two stages: selection and award. Everyone was allowed to submit his documents for the first stage. The submitted documents were assessed

on the basis of the grounds for exclusion and minimum requirements regarding financial and economical capacity and technical competences. The contractors who met these criteria were invited to submit a proposal in the final tender stage.

- 5/10 interviewees (#1E, #2E, #4P, #7C and #10C) were directly involved or partly involved in this procurement stage.
 - #7C and #10C argue that they were not involved in the selection stage, because Heijmans (the Contractor) has a separate department within the organization which consists of 3 people who do the pre-qualifications and pre-selections for all projects.
 - #2E and #4P argue that besides the criteria in the Selection Guideline, there were no other factors of influence in the selection stage.
 - #2E mentions that there was a long list of 8 contractors in the first stage and all contractors were allowed to the second stage, but 2 contractors withdrew because they did not think they would win the contract and did not want to make high tender costs with such low odds.
 - 4/10 interviewees (#1E, #2E, #4P and #10C) argue that the grounds for exclusion and the minimum requirements were sufficient for the Employer to determine the contractors' trustworthiness to carry out the project.
 - #2E and #4P argue that the grounds for exclusion were derived from the ARW2005 and the other requirements were chosen to exclude contractors which are too small to carry out the project, and that the focus in the first stage were the contractor's technical competences and capacity in terms of finances and personnel,
 - #1E stresses that in general, the Employer does apply lower selection criteria than other employers do, because the Employer thinks that besides the big contractors, many other contractors are also qualified to carry out such jobs.
 - #7C and #10C argue that most selection requirements for project are standardized, but sometimes there are project-specific requirements. As a big contractor, generally, it is not difficult for Heijmans to meet the selection criteria.
- B. According to the Tender Guideline (Provincie Fryslân, 2012b, pp. 10-14), the Employer applied the MEAT criterion. The award criteria for the tenders were the CO2-awareness certificate level and the tender price. The tenderers simply had to choose which level (0-5) they wanted to achieve. Only the three highest levels were associated with a discount on the tender price. The contractors' calculation designs including construction approaches were not part of the award criteria, but the Employer did offer two individual information exchange rounds in the final tender stage to discuss their tenders and to align them with the Employer's Requirements in order to prevent incomplete tenders and to adjust the contract if needed. Subjects of discussion were the construction method, the construction phases, the programme, the risks, the surroundings, and the traffic flow during construction.
- 4/10 interviewees (#1E, #2E, #4P and #7C) were directly involved or partly involved in this procurement stage.
 - #4P mentions that all contractors went for the highest CO2 level, which meant that the discount on the tender price was the same for everyone. As a result, it became a 'lowest price' procurement.
 - 4/10 interviewees (#1E, #2E, #4P and #7C) confirm that the individual information exchange rounds did not have an influence on awarding the contract.
 - #7C mentions that the Contractor was involved in one information round and that it was not clear a technical proposal was required as it was not part of the award criteria.
 - The Employer's team (#1E, #2E and #4P) states that the objectives of these rounds were to correct errors in the contract, to check if the contractors were heading into the right direction, to warn them if they misinterpreted any specifications, and to create a mutual understanding about the interpretation and the estimation of the project risks in order to submit and receive a more solid tender. #1E mentions that the information rounds had some legal implications as the Employer was not allowed to give instructions or indicate areas for improvement and for every question asked the Employer had to determine as to whether all tenderers should know about it.
 - The Employer's team (#1E, #2E and #4P) states that the individual information exchange rounds did have an influence on the trust level between the Employer and the Contractor, because that is when the first impressions of the contractors were created. Some contractors discussed their approach openly, whereas others did not want to discuss anything and acted unpleasant towards the Employer. So the Employer had gain trust in some parties and distrust in other parties during the rounds. One time, the Employer even wanted to suspend the meeting with a tenderer, because things got out of control. During these rounds, trust between the parties was created by means of the whole interaction in which the Employer focused on the contractor's competences and goodwill (i.e. taking each other's interests, concerns and risks into account).
 - #1E and #4P mention that Heijmans (the winning Contractor), was the most suspicious and tedious contractor during the rounds. The Employer struggled with the Contractor's bad first impression in the first months of the project implementation. However, #1E stresses that in general, the tender team is not the same as the project implementation team, therefore, a PSU has much more influence on the trust level between the parties, because then the parties could make collaboration agreements for the project implementation.
 - The Contractor's team (#7C) states that there was not much interest from the contractors to discuss the technical proposals openly during the information rounds, because it would lower a contractor's chance to win the contract. Therefore, the Contractor chose not to discuss anything, but merely asked some questions. The Contractor was afraid that the Employer would use these rounds to find more things to make the contract more rigid by means of turning aspects in which the Contractor excels into standard requirements for all contractors, and saying the Contractor is not allowed to do that way and subsequently amending the requirements.
- C. There is nothing in the project records regarding any requirements for the Contractor's team on the personal level.
- 5/10 interviewees (#1E, #2E, #4P, #7C and #10C) were directly involved or partly involved in this procurement stage. To a large extent, the Contractor's tender team was not the same as the project implementation team.
 - 5/10 interviewees (#1E, #2E, #4P, #7C and #10C) confirm that the Employer did not have any requirements regarding the Contractor's team. #1E and #10C argue that such requirements are not allowed pursuant to the European procurement rules.
 - #4P mentions that there were no interviews and the Employer did not request any CVs either, because the Contractor's team may change during the project anyway.

(8) Trustworthiness (integrity and benevolence)

Main findings:

- A. The Dutch Civil Code (DCC) is complementary to the UAC-IC 2005 and covers good faith (i.e. reasonableness and fairness).
- 7/10 interviewees (#2E, #3E, #5P, #6P, #7C, #8C and #10C) state that the principle of good faith in the DCC does not have an influence on the behaviours of the Employer and the Contractor. #2E, #3E, #5P, #7C and #10C argue that in the Netherlands, it is

- more a general principle one may expect from each other during a project, because in the end, both parties have to implement the project and move things forward. #2E and #8C mention that the parties never turn to the DCC, but the UAC-IC 2005 is used a lot during the project. #10C mentions that 9 out of the 10 people on the project probably do not know the DCC.
- 2/10 interviewees (#1E and #4P) argue that the principle does have influence on the behaviours at the highest escalation level, but not at the lowest level.
 - #2E, #6P and #7C argue that at the lowest level, the parties do not take into account good faith in first instance, but it only becomes important after intense discussions and when the parties have tightened their positions. #2E argues that it is logical because the content of good faith depends on the parties' interests and the facts. The principle of good faith is used to resolve the stalemate and the problem.
 - #1 argues that at the lowest level, matters often escalate to 'us versus them' behaviour (in Dutch: *hullie en zullie gedrag*). The parties act out of emotions and circumstances, rather than taking into account the DCC. Both Employer's and Contractor's team very often make the mistake of arguing about things they are not responsible for, rather than just identifying the problem and escalating it. Therefore, it is essential to define and agree on the roles and responsibilities in the escalation model. According to (Stevens, 2015), the main features of 'us versus them' behaviour are that 'I do not take responsibility for my own behaviour, because the other person is responsible for my behaviour' and vice versa, and that it goes on infinitely. For example, I do not talk to you, because you do not talk to me, and you do not talk to me, because I do not talk to you.
 - #3E and #5P mention that sometimes the parties should act more reasonable and fair on the project, because both parties tend to stick to their positions too long. Eventually, the parties do give in, but they could do this much sooner.
 - #1E and #4P argues that at the highest level where the mandates are, the parties look at the big picture and gather the matters, check whether they are caused by 'black and white' or 'grey' areas in the contract and subsequently make agreements about it. The principle of good faith is of influence here and becomes more important when more money is involved, partly because of the DCC, partly because the parties have to resolve the matters and partly because the parties have to take into account potential law suits.
 - #2E and #3E state that reasonableness and fairness has to be mutual to create a good working relationship.
 - #6P argues that on this project, the Contractor is less reasonable and fair than the Employer is, because the Contractor tries to take advantage of the Employer's reasonableness and fairness. #3E indeed states that usually, the Employer is reasonable and fair, but is a bit reticent towards the Contractor, because the Contractor seems to have merely one project objective, which is 'to make profit'.
 - #6P further argues that a risk analysis showed that the Contractor does not trust the Employer, partly because of how the Employer's team is set up. The Employer has a supervisor on site, and the Employer's team is quite involved in the project by means of the meetings and the checks of Contractor's documents during the acknowledgement process.
- B. The principle of good faith is included in some clauses in the UAC-IC 2005 (e.g. §4.5, §14.6 and §44.1).
- 4/10 (#2E, #7C, #8C and #9C) interviewees mention that the principle of good faith in the UAC-IC 2005 does have an influence on the behaviours of the Employer and the Contractor during the project. Good faith relates to the 'grey' areas in the contract. #8C mentions that on the one hand, the principle covers the implicit things the Employer may expect from the Contractor, and on the other hand, the principle helps to determine what the Employer may reasonably expect from the Contractor as a result of the requirements stated in the ER, and that the Contractor uses the principle of good faith to determine whether something is reasonable and fair according to the contract and whether something is a variation to the contract.
 - (#2E, #7C and #9C) argue that often, it is not clear what is reasonable and fair, because the Employer may interpret aspects different than the Contractor does. The parties' contradicting interests often cause that difference. It is difficult to make agreements in such situations. #2E argues that at the lowest level, parties tend to take their positions as it were 'black and white', therefore such matters have to be escalated where they have to be resolved by another approach (e.g. 'give and take'). #9C argues that a more 'black and white' contract leaves less room for discussion between the parties.
 - #9C argues that it is better to define 'reasonable and fairness' as clear as possible in the contract and to include an assessment model for it.
 - #2E argues that explicitly stating the principle of good faith in the UAC-IC 2005 would not make any difference in the parties' behaviours, because usually the parties already do adhere to that principle.
 - #2E states that the Employer uses the contract (including the UAC-IC 2005) as a guideline on the project, because it was drawn up with care in order to safeguard the compliance with the agreements made with the neighbourhoods and the stakeholders. Hence, the Employer often checks whether the Contractor meets the requirements in the contract.
- C. Reasonable behaviour is also covered in the collaboration agreements which are made between the parties.
- 7/10 interviewees (all, except #1E, #6P and #9C) state that the collaboration agreements do have influence on the behaviours of the Employer and the Contractor during the project, but some interviewees mention that so far, the parties have not adhered to these agreements completely. #5P argues that the agreements are quite standard, do not really constitute guidelines for the collaboration and are not enforced if someone fails to adhere to it.
 - #2E, #7C and #8C mention that openness, focus and timeliness are more difficult to comply with when there are problems on the project which involve a lot of money, because then the parties mainly try to protect their interests.
 - 2/10 interviewees (1E and #6C) argue that the collaboration agreements do not have any influence, because they are short-lived and not effective. #1E states that the parties' interests are too contradictory, which instigates the parties to behave like 'us versus them' at the lowest level. At the highest level, the parties do act reasonable and fair. Therefore, it is essential to clearly define and agree on the escalation model.
 - #9C argues that behaviours are mainly determined by people's characteristics and cannot be adjusted by means of such collaboration agreements.

(3) Objectives

Main findings:

- A. The Project Start Up meeting was led by a third party (Motion Consult) and encompassed a team building workshop in which the parties got to know each other, the team objectives were stated and each other's interests were discussed. The workshop concluded with a list of collaboration agreements (Project Start Up report).

- 9/10 interviewees (all, except #10C) state that in general, the Employer and the Contractor have partly complied with the collaboration agreements up to now. There are some problems regarding these agreements. According to #1E, similar collaboration agreements were made in other projects of the Employer, but none of these projects runs smoothly in accordance with the agreements made. #8C states that the collaboration agreements are quite standard and that it becomes more difficult for the parties to adhere to them when the project is not going well, and that in general, the Employer's team does adhere to any agreements made between the parties, which builds trust.
 - The parties do meet the requirements 'informal contact' and '1-on-1 contact'. The former is elaborated under component (9). #2E mentions that there is a lot of 1-on-1 contact between the parties, but often it happens by mail instead of by visit, because that communication method is faster.
 - 4/10 interviewees (#2E, #3E, #7C and #8C) argue that 'openness' varies during the project. If there are problems (which is the case at the moment due to major delays), the tension between the parties increases and the openness decreases during formal meetings because both parties want to protect their own interests. #3E mentions that the parties are quite open in informal 1-on-1 meetings, but not in larger formal meetings. #2E argues that in case of a potential claim, the Employer will not openly tell the Contractor how he feels about it, otherwise he will not have an argument anymore against the Contractor's claim.
 - #3E, #5P and #6P state that the Contractor often is not open about any problems and does not notify the Employer of problems timely, which leads to back-against-the-wall situations for the Employer in which he can only agree to the Contractor's proposal or escalate the problem.
 - 3/10 interviewees (#2E, #3E and #8C) had comments about the requirement 'focus on the target'.
 - #3E argues that the target 'to construct a high quality product within time and budget' an onerous thing to achieve, since the focus of the parties is contradictory. The Employer is mainly focused on the quality, whereas the Contractor is mainly focused on the finances. #8C argues that the Employer does not have a 'focus on the target', because regarding the construction method of the aqueduct, the Employer sometimes refers to the contract too much.
 - #2E states that both parties do not have insight into and an understanding of each other's internal processes. Therefore, the Contractor may think that the Employer has no 'focus on the target', because the Employer's processes usually take quite long, so it seems like the Employer does not want to co-operate or that the Employer deliberately makes it more difficult for the Contractor.
 - 3/10 interviewees (#1E, #2E and #5P) had comments about the requirement 'timeliness'.
 - #1E and #2E mention that 'timeliness' also refers to the time-bars for testing and acknowledging of the Contractor's documents. It usually takes too long for the Employer to make a decision. #1E further argues that the documents for testing usually lack quality.
 - #1E and #5P state that the overlap between the design phase and the construction phase did not run smoothly. The Contractor is late with finishing the design, which has put pressure on the Contractor to adhere to the programme for construction. #5P argues that this problem has arisen because the Contractor started out with a team that was too small to carry out the design work.
 - #5P argues that the Contractor does not always notify deviations to the contract timely, since some deviations were already implemented before they were notified to the Employer.
 - #8C argues that overall, the Employer does meet agreements made between the parties, which is one of the most important things to build trust.
- B. The parties' project objectives regarding the results were discussed in the PSU meeting, but were not aligned. The Employer stated his objectives in his Contract Management Plan (Provincie Fryslân, 2013, pp. 2-3), whereas the Contractor's were stated in his Project Management Plan (Heijmans Integrale Projecten, 2013, pp. 6-7). Pursuant to the Employer's Requirements part 1 and 2 (Provincie Fryslân, 2012d, p. 13; 2012e, p. 2), the works have to meet the ER and be fit for purpose. The Basic Contract Art. 16 includes several bonuses and fines for, for example, delayed completion, sustainability, safety, and road and waterway blocks. The latter is essential on this project as a part of the aqueduct can only be built in a certain period (15th May- 15th September) due to the sailing season. Bonuses for reducing the number of road and waterway blocks run up to a maximum of €300,000, whereas fines for exceeding run up to a maximum of €2,250,000.
- 6/10 interviewees (#2E, #4P, #5P, #7C, #8C and #9C) state that the Employer and the Contractor did not align the objectives regarding the results. The other interviewees do not know whether the objectives were aligned.
 - #4P, #5P and #9C mention that the parties indeed discussed their own interests in the PSU meeting.
 - #2E and #5P mention that the parties did exchange the documents, so they are aware of each other's interests.
 - #1E, #4P and #9C argue that it is difficult to align the objectives since these are quite divergent and contradictory. The project requirements are stated in the contract and the common goal is to deliver a good project within time. However, a 'good' project has different meanings for the parties. According to the Employer, the project is 'good' if the works are constructed against minimum costs and are of high quality, and if there is minimum disturbance for the surrounding neighbourhoods. A 'good' project for the Contractor is a project that yields maximum profit with minimum effort, for example, by building as cheap as possible and maximizing the scope.
 - According to the Contractor's team (#7C and #8C), the Contractor's project objectives were stated in the first PMP which was drawn up during procurement and these were based on the Employer's Requirements. It was not possible to align the project objectives in de documents because the Contractor did not know there was going to be a Contract Management Plan and he also received it quite late.

(4) Communication (system)

Main findings:

- A. The communication and information plans are stated in the Employer's Contract Management Plan (Provincie Fryslân, 2013, pp. 14, 22-28) and the Contractor's Project Management Plan (Heijmans Integrale Projecten, 2013, pp. 14-15, 81-88). These plans include the meeting schedule, the standard forms, the document flows, the document management system (DMS), file naming and procedures for invoices and variations.
- 10/10 interviewees state that so far, the Employer and the Contractor have complied with the communication and information plans stated in the Employer's Contract Management Plan and the Contractor's Project Management Plan and that these plans work quite well. There are only some minor problems.
 - #1E argues that in general, the parties have a lot of informal contract prior to sending the formal documents.

- #4P mentions that a lot of the communication happens through emails instead of the phone, which is a good method to record things, but the message is perceived differently.
- #6P mentions that PFU showed that the Employer thinks that the Contractor should communicate more, whereas the Contractor thinks that the Employer interferes too much with his work.
- #9C argues that the PMP is quite standard and is in line with the Contractor's operational processes, it only contains some project-specific aspects. The Contractor's team adhered to the PMP version 1.0 for about 90-95%. The PMP was updated to version 2.0 to make some improvements (e.g. the requirement of an estimation of the variation was added to the change management procedure).

(9) Communication (repeated fulfillment)

Main findings:

- B. According to the PSU report, a top 5 collaboration agreements was made and the most important one is 'informal contact'.
- Conforming to the interviewees, the Employer and the Contractor have informal contact by means of: the regular PFUs (which includes diner or drinks afterwards), the phone, the co-location (which was a deliberate decision to minimize the distance between the parties), the joint communication towards the public, the regular informal meetings (between people of the two highest escalation levels), the PSU, the visits (to discuss, align or confirm things), the Contractor's weekly stand (meeting between all relevant parties to reduce the construction time) and the emails.
 - #2E and #7C (the Employer's and the Contractor's project managers) mention that they do not work on this project on a fulltime basis. Further, #6P argues that the Contractor's team is mostly located in their own office. The distance between the two offices (about 200 km) impedes the amount of informal communication between the parties.
 - #9C states that with regard to variations, the parties communicate a lot by means of emails rather than phone calls, because that communication method is better to record contractual matters.
 - #6P argues that the parties do have informal meetings, but often fail to record the conclusions or a summary in a document.

(5) Problem solving (philosophy)

Main findings:

- A. According to the Basic Contract article 18, disputes will not be referred to the Dispute Adjudication Board (DAB) or to the Court of Arbitration. Instead, problems will be solved as much as possible by amicable agreement. All unsolved problems are disputes and will be referred to the Preliminary Injunction Court in Leeuwarden. The latter is in line with what (Bleeker, 2014b, p. 716) states.
- 2/10 interviewees from the Employer's team (#1E and #2E) know the actual reason why the Employer did not choose the DAB and the Court of Arbitration to settle disputes. Most interviewees did not know why the contract was amended, but some did have speculations and their opinions about it.
 - The Contractor's team (#7C, #8C, #9C and #10C) stresses that the Contractor was not involved in drawing up the contract and did not have any remarks on this article. In general, it is better for the Contractor not to ask questions during procurement, because he often has to deal with 'like it or lump it' contracts. #10C argues that if the Contractor asks a question, he might lower his chances of winning the contract and that mostly, employers do not amend a contract for one single contractor.
 - 2/10 interviewees from the Employer's team (#1E and #2E) argue that the DAB was not authorized to settle disputes, because if the disputes cannot be resolved amicably, then they are so large that only a judge can settle it objectively and independently. In the Netherlands, it is possible to refer such disputes to the court, therefore any other dispute resolution options such as DAB are not needed.
 - #7C argues that the choice is not logical, because the DAB's decision is based on expertise, whereas the judge merely looks at what is on paper and in the laws.
 - #10C argues that in general, 9 out of 10 times a DAB is not authorized to settle disputes. #7C mentions that the Provinces usually do not authorize a DAB, but Rijkswaterstaat mostly does.
 - Other reasons given against a DAB are: the DAB does not give a binding decision (#4P and #5P), the DAB focuses too much on the substantive matters instead of the legal matters (#10C), and the Employer may consider the procedure (including the setup of the DAB) quite onerous, while it is not clear what the added value of the board is (#10C).
 - 2/10 interviewees from the Employer's team (#1E and #2E) argue that the Court of Arbitration was not authorized to settle disputes, because the Employer is of the opinion that the Court of Arbitration is partial. Generally, it is composed of people from the contracting industry, it is impossible for the Contractor to take into account all explicit and implicit requirements in his tender as the submission period is usually short, and its previous decisions were mostly in favour of the Contractor. The judge, on the other hand, is independent. #6P has seen the same line of reasoning on other projects. This amendment to the contract was mainly decided by the Programme Manager, and is applied to all projects which he is responsible for and also to disputes in the procurement phase. The amendment is in accordance with the Province's general guidelines for large construction projects.
 - #8C argues that the Contractor will always advise to go the Court of Arbitration, because the arbitrators understand much better how the construction industry works and take the background of the issue into account, whereas the judges merely look at the contract.
 - Other reasons given against the Court of Arbitration are: the Court of Arbitration often looks for a compromise, which none of the parties is happy with (#6P) and the arbitrators focus too much on the substantive matters instead of the legal matters (#4P).
 - 0/10 interviewees seems to know why the Employer chose the Preliminary Injunction Court to settle disputes.
 - 4/10 interviewees (#1E, #4P, #6P and #7C) state that the Preliminary Injunction Court is the only alternative for the Court of Arbitration, and that this choice is quite usual in construction projects and is often in accordance with guidelines within the Employer's organization. #7C mentions that it is obvious that many sections in the contract are copied from previous contracts.

- #10C argues that the dispute resolution procedure may be chosen because it is short, but the Court of Arbitration has a short procedure as well. #6P stresses that when parties choose a short procedure, it is important that the parties also agree to accept the decision.
 - #1E and #10C argue that in case of disputes, the parties must refer the dispute to the Preliminary Injunction Court. #1E argues that the parties may appeal the decision, but also that the Employer will usually accept the judge's decision and will not appeal it.
- B. Article 18 in the Basic Contract article 18 also lays down a requirement to resolve problems as much as possible by amicable agreement.
- According to the interviewees, the parties do the following to resolve problems amicably: early warning, timely notification of variations, the Employer's warning obligation during testing and acknowledging of documents, extensive meetings about the substance in which the parties put forward their arguments, separate variations meeting, collaboration and mutual help (contractual and technical aspects are discussed in separate meetings), director's meeting as a last platform, the escalation model (day-to-day work level > management level > director level), timely escalation (so that the matter does not affect the relationship), and escalate to the highest escalation level (gather problems to look at the big picture, look for common solutions and negotiate about the other matters, then make a deal (e.g. 50/50)).
 - #2E argues that early warnings are mainly given by the Employer, but the Contractor does not want such early warnings. The Contractor argues that he is leading the project and knows what to do, and that the Employer is too involved considering the D&B contract. The Employer thinks he has an obligation to warn and thinks it is desirable behaviour. Therefore, when the Employer gives an early warning, the Contractor does not do anything with it or tries to make it appear less important than it really is.
 - #6C argues that mostly, the Contractor deliberately does not give an early warning or just a half warning (e.g. only indicate the time impact, but not the cost impact). Therefore, the Employer very often ends up in back-against-the-wall situations. #9C mentions that such situations are also caused by the overlap between the design and construction phase.
 - #4P argues that sometimes, the parties do resolve problems together (e.g. when the Contractor has a high risk), because the consequences of a risk always affect both parties and because the Employer also has technical consultants. For example, a part of the aqueduct can only be built during the winter because of the sailing season, but another activity on the critical path took longer than expected. Hence, the deadline was not met and now the Contractor suffers a 5-month delay. The parties try to resolve this problem together, because the delay has high cost consequences for both parties.
 - #2E argues that even though the Employer is not liable for the risk, he will discuss the risk with the Contractor and think about possible solutions in order to ensure that the Contractor takes into account all impacts in his solution. It is possible that the Employer proposes a solution, but it will only be implemented if the Contractor becomes liable for it.
 - #5P states that the meetings are not always as efficient, for example, because the right people are not involved.
 - #5P argues that the Contractor often does not listen to the Employer because of the Contractor's financial drive and the Employer's traditional attitude. When there is a deviation, the Contractor generally wants a cheap solution, whereas the Employer wants a more luxurious solution.
 - #6P argues that collaboration and mutual help is not optimal, but necessary on the project, because the Contractor does not take initiative in problem-solving as he should.
 - #8C argues that the Contractor usually resolves his own problems, but he may have to involve the Employer if a variation is required to resolve the problems.
 - #9C mentions that the parties agreed to automatically accept the decision of an escalated problem at the lowest level in order to maintain a good relationship.
 - #7C states that the escalation model does not work optimally due to the different mandate regulations in the Employer's and the Contractor's model. Generally, the discussions about matters are long because they start at the lowest levels, but most matters are immediately escalated to the highest level, because the mid-level has limited mandate.
 - #1E argues that problems are always about money and can only be resolved at the highest escalation level.
 - #1E states that in general, the Contractor tries to issue many claims related to the ER, but on this project, the Contract Manager was instructed by the Employer to say 'no' to such claims from the Contractor, because the Employer is of opinion that the contract is good. Such situations lead to disagreements, which have to be escalated to the highest level to be resolved by looking at the bigger picture.

(10) Problem solving (effectiveness)

Main findings:

- D. All problems seem to have been resolved by amicable agreement up to now.
- 10/10 interviewees state that so far, all problems were resolved by amicable agreement.
 - #2E, #4P #5P and #6P argue that some problems (e.g. the unexpected geotechnical conditions and the delays) were escalated to the highest level. #9C mentions that some variations were escalated to the mid-level.
 - #4P states that in general, claims will only be submitted when the project reaches its end, because that is when the Contractor can make a more accurate calculation of his actual costs. The claim for the 5-month delay has not been submitted yet, but it would be a claim worth over €1,000,000. The excavation of the cofferdam and construction of the tension piles for the aqueduct took longer than was planned, because the soil conditions were harder than expected. The Contractor argues that the Employer's geotechnical information did not show such density.
 - #1E, #6P and #10C state that in general, for both parties it will cost a lot of money to refer disputes to the court. Further, #1E and #2E do not expect the parties to refer any disputes to the court.

(6) Risk allocation

Main findings:

- A. The risk allocation between the Employer and the Contractor in the project is covered by §4, §13 and §41 in the UAC-IC 2005 and a project-specific risk allocation was added to the Basic Contract (Annex 12). The amendment is in line with what (Bleeker, 2014a, p. 611; 2014b, p. 716) states.
- The interviewees mention several reasons for drawing up the additional risk allocation.

- First, #1E and #3E state that it was to align it with the construction method for building underground. The risk of the correctness and the conclusions from the geotechnical research are carried by the Employer, whereas the risk of how the Contractor deals with that geotechnical information is carried by the Contractor. #1E argues that the geotechnical research was solid so that the tenderers could make an optimal and creative proposal. #3E argues that at the time of tender, the construction method was not known yet, but there are risks associated with building underground anyhow.
 - Second, #4P, #8C and #10C argue that it was to shift more risks regarding the geotechnical conditions towards the Contractor.
 - Third, #2E, #4P, #5P, #8C and #10C state that it was to define the risks clearer and more specific.
 - Fourth, #2E, #5P and #6P argue that the risk allocation was needed so that the contractors could estimate their risk allowances during the tender process.
 - Fifth, #2E, #4P and #6P state that it was to create efficiency by including thresholds to some risks so that the works can continue when the risk materializes.
 - Sixth, #10C mentions that the Employer added some risks which are not covered in the UAC-IC 2005.
 - #5P, #7C, #8C and #9C argue that it probably was added because the Employer wanted more certainty. #9C argues that this occurs more often in the contract in the form of conditions and restrictions. #7C mentions that the risk allocation annex is probably derived from previous contracts. #5P and #7C argue that it is not clear as to whether the risk allocation is legal, because it is not in accordance with the principle of reasonableness and fairness. The Employer is of opinion that he has conducted a lot of geotechnical research and provided that information to the Contractor, thereafter the Contractor is completely liable for all geotechnical conditions. #9C argues that the risk allocation is not 'black and white', therefore it may lead to disagreements about the liability of the risks, which is what happened on the project when the Contractor encountered different geotechnical conditions than expected. #8C states that pursuant to the UAC-IC 2005, the geotechnical risks remain shared between the parties if the Contractor can prove that he has done everything to adjust his works to the geotechnical information provided. #6P argues that the Employer does take into account reasonableness and fairness if the Contractor's risk materializes due to the Employer's fault. (Bleeker, 2014a, pp. 610-611) indeed mentions that the UAC-IC 2005 do not cover such situations.
 - The Contractor's team (#7C, #8C, #9C and #10C) stresses that the Contractor was not involved in drawing up the risk allocation and did not have any remarks on this annex. #10C argues that in general, it is better for the Contractor not to ask questions during procurement, because he often has to deal with 'like it or lump it' contracts. Further, mostly, employers are reluctant to align the risk allocation with the UAC-IC 2005. The amendment was allowed, because the ARW2005 was applicable.
 - 4/10 interviewees (#1E, #2E, #3E and #6P) argue that the risks are allocated to the party best able to manage them.
 - 2/10 interviewees (#4P and #7C) argue that the risks were allocated to the Contractor as much as possible, but #4P also mentions that the Employer did check if the Contractor was able to influence and manage the risks.
 - #1E and #2E argue that the risk of geotechnical conditions is mainly allocated to the Contractor. The Employer has done everything he could do to obtain information about the geotechnical conditions, and has provided it to the Contractor during procurement. The Employer remains liable for any errors in the geotechnical information, but the Contractor is liable for all other geotechnical risks, because the Contractor has to interpret that information and to determine his construction method himself.
- B. Pursuant to the project records, the parties do not seem to share any risks in terms of liability.
- 10/10 interviewees state that the parties do not share any risks in terms of liability.
 - #2E remarks that some risks do include a cut-off or a threshold.
 - #8C mentions that during the project, the parties did make some agreements regarding certain aspects to share the gains.
- C. It is not clear whether the Contractor is rewarded for carrying his risks.
- 10/10 interviewees state that the Contractor's reward for carrying risks may be included as a risk allowance in the tender price. It is up to the Contractor to do this or not.
 - #4P, #7C, #8C and #9C argues that in order to win the contract the Contractor had to offer a low price. Therefore, the Contractor could not have a risk allowance for all risks. Risks can be reduced by, for example, using alternative construction methods.
 - #4P states that the actual risk allowance is not clear, because the Contractor might show a different estimation to the Employer than the one he uses internally.
 - #7C states that some risks were difficult to price, especially the geotechnical risks. Therefore, it is important that the Employer takes into account the principle of reasonableness and fairness here.
 - #2E states that the risk owner of new risks depends on their origin. New risks regarding politics, laws, regulations etc. are carried by the Employer, whereas new design and construction risks are carried by the Contractor. #5P and #6P state indeed that the Contractor is liable for new construction risks and should include them in his risk allowance, so he does not get a reward for it.
 - #9C argues that the Contractor may also be rewarded by means of change orders.
 - #1E, #3E and #5P mention that there are some bonuses and fines included in the contract for the risk of not meeting the milestones, because that would cost the Employer a lot of money.

(7) Continuous improvement (system)

Main findings:

- A. There is nothing in the project records regarding a system or measures for the purpose of improving the relationship between the parties during the project.
- 9/10 interviewees (all, except #10C) state that the Employer and the Contractor agreed on regular PFUs (every 3-6 months) for the purpose of improving their relationship during the project. #2E mentions that the PFUs are attended by the Employer's and Contractor's core teams and are sometimes led by a third party. The aim of the PFUs is to reflect on the collaboration and the collaboration agreements between the parties and to discuss the main concerns.
 - #2E remarks that the agreed formal and informal meetings also help and that there is a survey for the Employer's and Contractor's core teams.
 - #3E argues that the PFUs still have an added value since the parties have not reached that point yet where the parties' points of view too divergent.
 - #5P states that the PFUs are not optimal and fully effective, because some people are too busy and do not have time to prepare themselves well for the PFUs and because the parties seem to have different objectives for the PFUs.

(11) Continuous improvement (emotional investments)

Main findings:

- B. There were a PSU and PFU for the purpose of improving the relationship between the Employer and the Contractor. At the PSU meeting, there was an exercise to get to know each other. At the PFU, 10 months later, the parties reflected on the collaboration so far and discussed possible improvements, such as maintaining a buffer between the design and construction phase, less documents for the acknowledging process, fulfil the joint promise towards the surrounding neighborhoods, quicker decision-making, and align the interpretation of the D&C contract. The latter was discussed at the PFU meeting. The Employer wants to be involved and be on top of it, and argues that the Contractor should just accept this situation as they chose it themselves when signing the contract and wants the Contractor to give prominence to something else. Whereas the Contractor wants more freedom, and argues that there is no room in the 'grey' area as the Employer does not listen to their proposals and immediately refers to the contract (Project Follow Up Report 14-01-2014).
- #4P mentions that there have been two other PFUs, but without that third party.
 - 5/10 interviewees (#1E, #2E, #4P, #7C and #8C) state that the meetings have improved the relationship between the parties, because you gain insight into the other party's interests and points of view.
 - 4/10 interviewees (#3E, #5P, #6P and #9C) state that these meetings did not improve the relationship, but it was not worsened either. #5P and #9C argues that such meetings do not create trust between the parties, because trust is created thereafter. #5P argues that it is nice to make agreements at such meetings, but it is useless if the parties do not adhere to them. #9C argues that 80% of the trust is influenced by the people's characteristics and 20% is influenced by people's competences. #6P mentions that the Contractor's team has changed in between those two meetings (i.e. different process manager and construction manager) and that the PSU was not optimal because the parties did not align their participants.
 - #1E and #5P state that the relationship between the parties is not bad, but some things can be improved.
 - #2E states that both the Employer and the Contractor acknowledged the objective and the relevance of the meetings.
 - 7/10 interviewees (all, except #1E, #6P and #10C) state that the main concerns regarding the collaboration were only discussed during PFU, were not dealt with after the meetings, and are still not resolved.
 - 5/10 interviewees (#2E, #4P, #7C, #8C and #9C) state that the main point of discussion in the PFU was the interpretation of the D&C contract. The Employer's perception of a D&C project is different than the Contractor's. The Contractor argued that it is not a D&C, but rather a E&C project because the Employer already has a solution in place for many aspects. The Employer argued that it is a D&C, because the Employer has defined the design components in the contract and the Contractor is free to determine the complete structural design, he only has to take into account some conditions (e.g. the visual design is fixed). Both parties stuck with their point of view and accepted that the problem could not be resolved. This subject recurs in many discussions, but it cannot be resolved.
 - #2E argues that the other subjects of the PFU do not recur very often in other discussions and are less difficult to resolve.
 - #2E mentions that it is more important to the Employer to fulfil the joint promise towards the surrounding neighborhoods. #7C states that sometimes, the Employer is more worried than the surrounding neighbourhoods themselves.
 - #9C mentions that the overlap between the design phase and the construction phase affects the Contractor's work processes, but the overlap can only be resolved by postponing the construction phase, which is not a realistic option.

(x) Other trust components

- A. Other components which are relevant for building and sustaining trust between the Employer and the Contractor on this project are:
- #1E: Problem-solving at the right level
 - #2E: Involve the other party in the processes and the decision-making (i.e. provide more insight into how things come into being).
 - #5P: Timely escalation
 - #5P: Clearly defined verification and validation system
 - #6P and #10C: Open communication
 - #8C: Respect each other's 'own' objectives (e.g. maximum quality for the Employer and minimum profit for the Contractor).
- B. Remarks on existing components:
- #2E mentions an addition to 'reasonable behaviour': keep to agreements and not question them again.
 - #7C mentions an addition to 'joint goal-setting': align the sustainability eye catcher
 - #8C mentions an addition to 'trustworthiness of person': integrity

28.3 Overview of trust building aspects on the project

Table 105: Overview of trust building aspects on project Drachtsterweg

Building trust (score 3-4)
(3) Focus on the target in terms of the programme mainly due to bonuses and fines
(4) Clear communication system
(4) Use of a shared Document Management System
(4) Basic use of standard forms and registers
(5+9) Separate formal problem-solving meetings for risks, technical and contractual aspects and 1-on-1 informal meetings.
(9) Regular informal meetings and PFUs
Could be done better to build trust (score 2-2.5)
(1) Restricted procedure, European tender
(1) Requirements on the organizational level were merely based on the technical and financial competences and were quite standard
(1) The Employer did not have any requirements regarding the Contractor's team and did not request CVs.
(1) The tender team is not the same as the project implementation team
(3+5+8) No other mutual objectives besides fitness for purpose, therefore the objectives remained contradictory
<i>*(3+5+8) The Employer wants a higher quality product than the Contractor is delivering, therefore the Employer often refers to the contract.</i>
(3+8) The collaboration agreements (openness, focus on the target, timeliness etc.) are quite standard and are not fully effective due to contradictory interests
(3) Win-partial win situation due to lowest price tender
(3) The overlap between the design phase and the construction phase does not run smoothly
<i>*(5) The Contractor fails to give EWs, whereas the Employer gives many EWs, but these are unwanted</i>
(5) Collaboration and help to resolve mutual problems and Contractor's problems is not always effective
(5+8+x) The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides.
(6) Ultimate risk allocation is unclear due to good faith
(6) The Contractor could not include all his risks in the risk allowance due to the lowest price tender
(6) Risks are allocated to the party best able to manage them, except for the geotechnical conditions
(7+11) The PFUs are not optimal and fully effective. The issues discussed at the PFUs are not resolved and are not dealt with afterwards.
(8) Good faith in the DCC only has influence at the highest escalation level
(8) 'Us versus them' behaviour and no mutual reasonable and fair behaviour at the lowest level
(8) Good faith in the UAC-IC 2005 covers the implicit requirements of the contract, but may lead to disagreements as it is open to interpretation.
(9) Less informal contact due to part-time co-location
(10) Disputes cannot be referred to the DAB or arbitration, but only to the court.
(10) Most problems concern money and can only be resolved at the highest level
(10) Some problems could not be resolved at the lowest level
<i>*(x) The parties do not involve the other party in the processes and the decision-making (i.e. provide more insight into how things come into being)</i>
Building distrust (score 1-1.5)
(1) MEAT award criterion was not applied correctly and did not include the technical proposals, as a result it became a lowest price procurement.
(1) The Contractor's goodwill was tested during the individual information exchange rounds, but these rounds did not have an influence on awarding the contract and created distrust between the parties.
(1+5) 'Like it or lump it' contract which contains many amendments.
(5+8) The Employer is quite reluctant to accept claims related to the Employer's Requirements
(5+6) Disagreement about the responsibility of the unexpected geotechnical conditions
(5/8) Sometimes the Contractor issues questionable variations
(6) No risk sharing
*(11) Disagreement about the interpretation of the D&C contract (i.e. the Employer's role and the design freedom)

BOLD = (Related to) condition of contract, ITALIC = Amendment to contract, GREY = Important aspect, * = influenced by the Employer's traditional way of acting

28.4 Assessment of change management in the project

Table 106: Assessment model for change management on project Drachtsterweg

Objective	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)	
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	2.5
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	3
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	1.5
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	2.5
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	1.5
			(6) Update shared databases and incorporate lessons learned for project and organization	4	1
	Recognize change	Change management process	(7) Early identification of potential changes	4	2
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	2
			(9) Document the proposed change in a log	3	3
	Evaluate change		(10) Determine priority of the change	3	2
			(11) Selection of optimum change options by consulting all relevant parties	3	2.5
			(12) Identify the likely impacts of different change options	3	2.5
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	2
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	3
			(15) Appropriate documentation to record all decisions within the change process	3	2
	Monitor implementation		(16) Monitor and record implementation	3	3
TOTAL LEVEL OF CHANGE MANAGEMENT			3.19	2.25	

(1) Objectives

Main findings:

- A. According to the Employer's Contract Management Plan (CMP) (Provincie Fryslân, 2013, pp. 2-3), the Employer's objective is 'to minimize the number of scope changes and additional work'. The Contractor's Project Management Plan (PMP) did not include any specific change management objectives, but the objective 'profitable project' is contradictory to the Employer's objective (Heijmans Integrale Projecten, 2013, pp. 6-7).
- 8/10 interviewees (all, except #6P and #10C) are directly or partly involved in the change management process and state that the Employer and the Contractor did align the objectives regarding the procedures for change management, but not regarding the results.
 - #1E and #5P mention that parties' own objectives were discussed during the PSU, but there is no common change management objective. #2E and #4P state that the CMP and the PMP were exchanged, but the change management objectives were not discussed.
 - #1E argues the Employer's objective is a general one since employers do not want any scope changes once they have tendered the project. The Contractor will support consistency of the scope, but not minimizing the scope changes, because the Contractor had to offer quite a low price to win the contract and he can increase his profit by means of scope changes.
 - #5P remarks that the Contractor is looking for ways to make profit, because sometimes he submits questionable variations.
 - #3E states that it is not effective to have a quota for the scope changes, because the Contractor has the right to submit a change order if he thinks it is a variation.
 - #8C and #9C argues that the achievement of the Employer's objective is impossible if the contract does not cover the aspect or contains errors or ambiguities, because then variations become necessary to achieve the overall project objective. #7C also argues that to achieve the Employer's objective, the Employer should look at the cause of scope changes. #9C further argues that it is up to the Employer to decide whether he accepts the Contractor's functional interpretation of the requirements, otherwise he has to submit a variation for it.
 - #5P argues that the parties should create a better process together to deal with stakeholders' additional requirements. The stakeholders have to give approval for scope changes, but they often have additional requirements or wishes. Therefore, the Employer's team has to take into account the principle of good faith in order to prevent the shifting of liabilities towards the Employer.
- B. The Employer's objective regarding risk management is stated in the Employer's Requirements (ER) and is 'to identify and manage risks for the purpose of a smooth running design and construction process' (Provincie Fryslân, 2012e, p. 71).
- 8/10 interviewees (all, except #9C and #10C) are directly or partly involved in the risk management process and state that the Employer and the Contractor did align the objectives regarding the procedures for risk management, but not regarding the results.
 - #1E mentions that the objectives were discussed during the PSU and #5P remarks that the parties did discuss their own objectives again at the first risk meetings, but there is no common risk management objective.
 - #2E and #4P argue that since the Employer's objective is stated in the ER, it could not be aligned anymore and the Contractor has to comply with it.

- 5/10 interviewees (#1E, #2E, #7C, #8C and #10C) argues that the Employer's objective in the ER is quite general. Therefore, the Contractor's standard objective for risk management should be more or less the same, because all parties benefit from good risk management.
- #5P and #6P state that the parties' objectives regarding the results are different. So far, the Contractor does not take on risk management very seriously and only does the least possible, because he does not deal with the risks discussed at the meeting or only deals with them when they materialize. The Contractor thinks that risk management is 'business as usual', therefore he does not include many risks in the risk register as he considers them to be standard operational risks.

(3) Risk allocation

See trust criteria (6).

(4) Risk management

Main findings:

- A. The risk management plans are stated in the Employer's Contract Management Plan (Provincie Fryslân, 2013, pp. 30-34, annex 31) and the Contractor's Project Management Plan (Heijmans Integrale Projecten, 2013, pp. 53-57). These plans include the roles and responsibilities, the setup and use of a risk register, the risk sessions, the analysis of risks and the alignment of both risk registers.
 - 8/10 interviewees (all, except #1E and #10C) are directly or partly involved in the risk management process and state that so far, the Employer and the Contractor have complied with these risk management plans. Overall, the plans work well, but there are a few minor problems.
 - #7C mentions that the parties sometimes do argue about who is liable for a risk.
 - #5P mentions that according to the system audit, the Contractor does follow the risk management procedure, but does not take updated risks into account in the design and construction process. #8C indeed states that the parties do align their risk registers, but they do not do much with it thereafter.
 - #3E and #6P remark that generally, the parties argue about the quantification of the risk impact as the contract is not clear about it. #6P states that the parties did align the method to quantify the impact, but not the quantification itself because this may differ for both parties as they have to work with different budgets. Therefore, the parties do align the risk registers, except for the probabilities and the impacts. The parties are free to adjust the latter and discuss it during the meeting.
 - #3E states that the parties sometimes argue about whether something should be considered a risk.
 - #4P remarks that the Contractor's risk analysis is often incomplete, therefore the Employer has to ask for it. This problem is caused by the fact that the parties have different opinions about the content of that risk analysis.
- B. It is not clear from the project records how proactive the risk management approach of the parties is.
 - According to the interviewees, the risk management approach by the Employer during the project is largely proactive. There are several reasons for that.
 - #4P argues that risk measures for all risks are in place and the risks are monitored constantly, especially the top 20 biggest risks.
 - #6P mentions that identifying the risks goes well.
 - #3E states that the Employer often has to warn the Contractor about construction risks.
 - #2E argues that the Employer is quite active regarding the Contractor's risks by means of trying to get information from the Contractor about the (i.e. asking how he sees them and what he is going to do about them).
 - #5P argues that risk management is part of managing the contract and that the parties regularly have risk sessions and risk management meetings.
 - #6P states that mitigating and reducing the risks can be improved.
 - #1E argues that the approach is not entirely proactive, because there have been some unexpected risks as well.
 - According to the interviewees, the risk management approach by the Contractor during the project is half reactive/half proactive. The Employer's team thinks that the Contractor is quite reactive, whereas the Contractor's team think they are quite proactive. There are several reasons for that.
 - #8C states that every identified risk is managed proactively and mitigation measures are in place, but the risks which are not in the risk register are dealt with reactively.
 - #9C argues that the Contractor mainly manages the risks with the biggest impact proactively, because with these you can gain the biggest wins.
 - #7C mentions that the Contractor also has internal risks sessions in which new risks may arise.
 - #5P and #6P argues that the Contractor does considers a part of the risks as standard operational risks, therefore these are not in his risk register and are not shared with the Employer. #6C is not sure as to whether the Contractor manages such risks. #5C argues that the Contractor does not do anything about them, because he is afraid to impose any responsibilities upon himself, which the Employer can hold him to.
 - #2P argues that the Contractor is very hesitant to share information about his risks, because he wants to avoid the Employer bothering him about them.
 - #2E and #6P remark that risk management does not play an explicit role in the change management procedure. However, #2E argues that risk mitigation measures may consist of variations and variations may have an impact on risks. #6P states that if risk mitigation measures contain a variation, these were already included in the contract or the Contractor's tender price, and that the parties do not look into the risk register when there is a variation to see how the Employer dealt with it or thought about it.

(2) Change management procedure (overall)

Main findings:

- A. §14, §15 and §45 in the UAC-IC 2005 set out the variations procedure. The variations procedure stated in the Employer's Contract Management Plan (Provincie Fryslân, 2013, pp. 27-28, annex 21) and the Contractor's Project Management Plan (Heijmans Integrale Projecten, 2013, pp. 17-21) is based on these clauses. However, there are some amendments and deviations. First, §14.13 - §14.15 (i.e. the DAB to settle disagreements in the procedure), §14.16 (i.e. the variation will be withdrawn if there is no agreement on the impact) and §14.17 (i.e. compensation for the Contractor in case of delays in the procedure) were omitted. Second, the check whether the

Contractor is obliged to carry out the variation does not seem to be required and the deemed acceptance does not seem to be applicable.

- #1E mentions that §14.13 - §14.15 were omitted, because the DAB was not authorized to settle disputes.
 - #1E and #2E state that §14.16 (i.e. the variation will be withdrawn if there is no agreement on the impact) was deleted to force the parties to make agreements and because all variations initiated by the Employer are necessary ones.
 - #1E and #2E state that §14.17 (i.e. compensation for the Contractor in case of delays in the procedure) was omitted to remove an incentive for the Contractor to delay the processes and because sometimes it takes a long time for the parties to settle the variations due to busy schedules of the people involved.
 - 5/10 interviewees (#2E, #4P, #5P, #8C and #9C) argue that due to efficiency, the Employer demands an estimate of the impact beforehand for every potential variation in order to determine whether he wants to proceed with the variation or not. #5P argues that this method is more efficient than in the UAC-IC 2005, because the latter procedure could lead to disagreements when the Employer has already given his approval for the variation, but wants to cancel it anyway if it appears to be too expensive. #2E argues that if the price is too high and the parties cannot agree on it after discussions, then the Employer can talk to the stakeholders or look for another contractor to implement the variation (which may be difficult though because the work is on the Contractor's work area).
 - #9C mentions that the Employer wanted to amend the change management procedure early on by including the requirement of a quotation to the change order. The Contractor disagreed to that amendment, because the financial impact of a variation does not determine as to whether something is a variation to the contract, and it may not influence the decision either. The latter happens a lot in practice. In addition, the Contractor has to use many resources (time and money) to draw up the quotation. Therefore, the parties agreed to a compromise, which is to include the requirement of an estimation of the variation to the change order. The estimation merely consists of a price for the variation.
 - #2E and #5P mention that the check whether the Contractor is obliged to carry out the variation does not take place, because the Employer assumes that the Contractor will carry out any variation within his work and work area. #5P and #7C argue that leaving out this step does not really lead to any problems, because mostly, the Contractor is willing to execute the variation. #2E further argues that if the variation does not involve the Contractor's works or work area, then the Employer can just get another contractor to do the job.
 - #2E, #5P, #8C and #9C stress that the deemed acceptance is still applicable, but both parties do not use it because the communication about variations is not that formal as in the UAC-IC 2005, because the parties agreed always to reply to communication (so far, this works), and because the parties try to remain in discussion and to keep making progress. #5P argues that the deemed acceptance is not a helpful, because both parties are quite busy with other things.
 - #4P mentions that compared to the UAC-IC 2005, the variations procedure used is simplified and less formal.
- B. It is not clear from the project records as to whether the parties apply any of the variation clauses in the UAC-IC 2005.
- 7/10 interviewees (all, except #1E, #6P and #7C) state that all sub clauses of §14, §15 and §45 in the UAC-IC 2005 are applied for dealing with variations, except for the omitted ones. #4P mentions that all amendments were made by the Province.
 - #2E mentions that if needed, these clauses are used to determine whether it is a variation or not.
 - #4P argues that the Employer only uses the UAC-IC 2005 to determine what type of variation it is. #3E mentions that the parties have to state on the change order to which document, requirement, clause, article etc. the variation relates. The UAC-IC 2005 will be consulted if something is not clear.
 - #8C remarks that variations to the Basic Contract and to the ER are dealt with through the variations procedure, but the parties agreed to record variations to acknowledged documents as deviations, because the Employer really has requested a lot of documents for the acknowledging process.
- C. The project records do not show whether the parties have adhered to the change management procedure stated in the Employer's Contract Management Plan and the Contractor's Project Management Plan. The roles and responsibilities in both teams regarding change management are set out in these plans. The parties agreed to use a standard form for variations.
- 7/10 interviewees (all, except #4P, #6P, and #10C) state that so far, the Employer and the Contractor have complied with the change management procedure.
 - #2E, #3E and #5P argue that the change management process is not very efficient. Due to the discussions about variations and the escalations, it usually takes long to come to an agreement between the parties. #5P mentions that sometimes, the processing of variations may take months, partly because the Contractor did not put a price on it yet.
 - #9C argues that the efficiency of the variations procedure depends on how the parties communicate about it, the price of the variation and the timing of notifying the price. To increase efficiency, the parties agreed to send a draft version of the change order by email.
 - #6P argues that some variations are already implemented before the variation orders are submitted. #5P and #8C confirms that.

(7) Change management procedure (early identification)

Main findings:

- D. §4.7 in the UAC-IC 2005 lays down an obligation for the Contractor to warn for apparent errors in the Employer's documents. On this project, the Employer has added an extra control and warning obligation for the Contractor in the Basic Contract (annex 14).
- 2/10 interviewees from the Employer's team (#1E and #2E) know the actual reason why the Employer chose to add this extra control and warning obligation to the contract. #4P confirms that the Province drew up this amendment and #8C stresses that the Contractor was not involved in drawing up the contract. Most interviewees did not know why the contract was amended, but some did have speculations and their opinions about it.
 - #1E and #2E state that the amendment with the extra control and warning obligation was made, since it is important to the Employer that the information provided (e.g. the geotechnical information) is correct because he is liable for that information and because during procurement, the tenderers determine their construction method on the basis of that information. The Employer wanted to instigate the Contractor to take on a more proactive attitude in his research of the documents, so that he can check the correctness of the information provided and warn the Employer about any errors and ambiguities early on.
 - #1E and #2E state that the Employer can always fall back on this amendment if he can prove that the Contractor knew about the errors in the document, but this situation does not occur very often. #2E argues that the Employer can use the fact that the Contractor did not give a warning as an argument during negotiation, but the argument is not strong enough to take away the

Contractor's entitlement to compensation for the variation. The argument can be used to define the 'grey area' during negotiations.

- #7C, #8C and #10C mention that the extra control and warning obligation is more stringent than the existing one, because the Contractor has to warn for all errors and not just the obvious ones.
 - #4P, #5P and #7C think that the Employer wanted to create more certainty for himself. #7C thinks that the amendment was probably copied from previous contracts.
 - #9C thinks that the Employer wanted to make the Contractor more liable for errors in the documents.
 - #2E argues that the Contractor had received the Employer's documents during the tender process, where he could ask questions and he also had a warning obligation for ambiguities and the questions asked. After the contract award, the Contractor had the opportunity to check the documents again and to warn if needed. During the project, the Contractor gains more and more insight into the documents. The Employer expects the Contractor to be on top of it, but the parties did not make any agreements about the content of that extra control and warning obligation. Judges and arbitrators will look at the process and the moments when the Contractor should have warn the Employer.
 - #5P argues that the principle of good faith is also important here as the Employer cannot expect from the Contractor that he conducts an extensive check of all documents during the tender process.
 - #5P argues that if the Employer shift everything towards the Contractor, the Contractor cannot completely focus on the relevant matters.
 - #8C argues that the amendment is a bit self-contradictory, because all Contractor's documents are deemed to contain no errors, but the Contractor also has to check the Employer's document for errors.
 - #9C argues that the warning obligation of clause 4.7 is not clear regarding contradictories in the ER as a result of different interpretations of the requirements in the ER. The Contractor cannot warn for such contradictories, because he is not aware of them. #7C mentions that there are really a lot of things in the contract which are open to interpretation.
 - #1E and #2E state that the Contractor does not adhere to those extra obligations sufficiently, but it is difficult to prove that the Contractor should have discover an error since the Employer cannot ask the Contractor to see something he did not see. #6P also mentions the former and #4P the latter. Therefore, the liability of the error does not shift towards the Contractor, because he can always state that he did not see it. #1E argues that such clauses are for show, because if the Contractor discovers an error in the Employer's documents and he thinks he is the only one who has seen it, then he could make quite use of it rather than giving a warning about it. #7C and #8C confirm that the Contractor does check the documents, but does not conduct extra checks, but this has not lead to any problems up to now and the Employer has not referred to this annex yet.
 - #2E mentions that on this project, there is also a discussion about the Employer's warning obligation. The Employer is of opinion that he also has a warning obligation towards the Contractor and that reciprocity of the Contractor's warning obligation can be derived from the UAC-IC 2005. The Contractor does not think the Employer has such obligation pursuant to the UAC-IC 2005.
- E. It is not clear from the project records how proactive the change management approach of the parties is.
- According to the interviewees, the change management approach by the Employer during the project is half reactive/half proactive to largely proactive. There are several reasons for that.
 - #4P and #5P mention that the Employer does not initiate many variations, but the Municipality sometimes has some variations requests. #6P argues that the Employer does not want variations since they usually have time and cost consequences and #1E argues that the Employer does not want unexpected scope changes.
 - 5/10 interviewees (#1E, #2E, #3E, #4P and #5P) state that the Employer does identify variations and deal with them quickly.
 - #4P argues that the approach is sometimes quite reactive, because of the Employer's strategy. For some aspects, it is better not to notify things early to the Contractor.
 - #2E argues that the Employer is quite slow with dealing with variations initiated by the Contractor which concern parts that the Contractor already started to construct.
 - #4P argues that the Employer checks many Contractor's documents, therefore he is better able to foresee any variations.
 - #1E argues that it is not a good sign if you are not entirely proactive, because that would mean that things just happen to you. On this project, the design will not be changed once parts of it are already built.
 - According to the interviewees, the change management approach by the Contractor during the project is half reactive/half proactive to largely proactive. The Employer's team thinks that the Contractor is quite reactive, whereas the Contractor's team think they are quite proactive. There are several reasons for that.
 - 5/10 interviewees (#1E, #3E, #4P, #5P and #7C) state that the Contractor does identify variations and deal with them quickly. #6P argues that the Contractor wants to process the variations quickly, therefore he gives less substantiation of the time and cost impact, while the Employer wants to know more details.
 - #9C argues that the Contractor is quite proactive with assessments to check whether something is a scope change or not, otherwise the Contractor would lose money over it.
 - #2E and #6P argue that the Contractor is too slow and too negligent with submitting variations. It seems like the Contractor does not want any variations.
 - #4P argues that the approach is sometimes quite reactive, because of the Contractor's strategy. For some aspects, it is better not to notify things early to the Employer.
 - #8C argues that some variations are already implemented before the parties have reached the end of the variations procedure or they are submitted afterwards.
 - #1E argues that it is not a good sign if you are not entirely proactive, because that would mean that things just happen to you. On this project, the design will not be changed once parts of it are already built.
 - 3/10 interviewees (#2E, #6P and #9C) mention that the standard warning obligation and the extra warning obligation do not explicitly play a role in the change management procedure.
 - #2E argues that these warning obligations are not used to identify potential variations early, but it is used for identifying risks. #2E and #8C state that risk mitigation measures may consist of variations.
 - #6P argues that the obligations are not effective since the Contractor does not adhere to them.
 - #2E argues that the Employer can use the fact that the Contractor did not give a warning as an argument during negotiation, but the argument is not strong enough to take away the Contractor's entitlement to compensation for the variation. The argument can be used to define the 'grey area' during negotiations.

(7-16) Change management procedure (standard processes)

Main findings:

- F. The Employer and the Contractor agreed on standard change management processes, which are stated in the Employer's Contract Management Plan (Provincie Fryslân, 2013, pp. 27-28, annex 21) and the Contractor's Project Management Plan (Heijmans Integrale Projecten, 2013, pp. 17-21).
- According to the interviewees, these more or less correspond to the ones in the assessment table.
 - There were a few remarks on the processes:
 - (10) The priority is determined unknowingly by looking at the impact.
 - (11-12) There are only multiple change options in case of big variations, therefore the Employer is not always involved in this process.
 - (13) The mandate regulations determine who has authority to make the decision. The speed of decision-making depends on the priority and the total impact of the change, the mandate regulations, the completeness of information, the work load, whether the variation is realistic, how long the discussions are, and whether there is an agreement on the technical and financial part.
 - (15) Only the acceptance and the revisions are documented, but the decisions in the process are not (this is only documented for big variations).
 - (16) Monitoring a design change is different than monitoring a construction change. The implementation is recorded by means of verification of the changed requirement.
 - Overall, the change management procedure is followed as consistent as should be, but sometimes variations were already implemented and submitted afterwards.

(9+15-16) Change management procedure (documentation)

Main findings:

- G. The Employer and the Contractor use a variations register and a standard form to create an audit trail for variations.
- According to the interviewees, the Employer and the Contractor use a variations register and a standard form to create an audit trail for variations. Moreover, the Contractor records the implementation by means of verification of the changed requirement. Other decisions in the change management process are usually not documented.

(5+6) Continuous improvement (review and share knowledge)

Main findings:

- A. There is nothing in the project records with regard to learning from changes and sharing this knowledge.
- 8/10 interviewees (all, except #6P and #10C) are directly or partly involved in the change management process and state that the Employer and the Contractor do not create 'lessons learned' specifically from change events. The parties learn from changes unknowingly.
 - #7C and #9C argues that learning from changes is more interesting for the Employer since variations are caused by forgotten aspects in the contract or are initiated by the Employer. The Employer may not have given enough attention to certain aspects during the contract preparation phase or could not have foreseen it because the Contractor's construction method was still unknown. However, #9C states that a graduation research showed that the costs of drawing up a watertight contract are higher than the benefits of it due to competition on the total price of the project.
 - #8C states that the change management procedure was assessed by means of the system audits. The results showed that all parties adhered to that procedure.
 - #1E and #3E mentions that the Employer's team only shares knowledge about change events informally with other project teams within the organization. #1E argues that only the remarkable changes events will be analyzed, which has not happened a lot so far.
 - #10C remarks that sharing such knowledge between the parties is quite useless.
- B. There is nothing in the project records with respect to measuring the risk management performance.
- 5/10 interviewees (#1E, #2E #4P, #5P and #6P) state that the parties do not measure the risk management performance (effectiveness and efficiency). #1E argues that he will intervene if the same problems happen over and over again and if the additional works exceed 7% of the total construction costs.
 - #5P and #8C remark that the system audits do show whether the procedure is followed by the Contractor and whether the Contractor does what he said he would do, but they do not show what can be improved. It is up to the Contractor to adjust his processes.

(x) Other change management components

- A. Other systems or processes which are relevant for creating an efficient and effective change management process on this project are:
- #8C and #9C: Separate regular variations meeting
 - #8C: Informal discussion about variation
 - #10C: Early escalation
- B. Remarks on existing components:
1. #2E mentions an addition to 'standard processes': an overview of the total impact
 2. #4P mentions an addition to 'clearly defined change management procedure and roles/responsibilities therein': the escalation model.
 3. #8C mentions an addition to 'risk management system': many variations occur in other processes, such as the preparation process or the verification process. If the Contractor cannot verify a requirement as it is stated in the ER, then it is a deviation. If the deviation cannot be corrected, a variation to the contract becomes necessary to verify the requirement.
 4. #10C mentions an addition to 'early warning': early notification even if the impact is not clear yet.
 5. #10C mentions an addition to 'appropriate documentation of the change process': the substantiation of the variation is essential.

28.5 Overview of efficiency and effectiveness creating aspects on the project

Table 107: Overview of efficiency and effectiveness creating aspects on project Drachtsterweg

Creating efficient and effective CM process (score 3-4)	
<i>(2) Clear and efficient change management procedure</i>	
(2) Use of standard form and change register	
(4) Clear risk management procedure	
(2+x) Discuss variations informally or during the separate regular variations meeting prior to the formal procedure and send a draft change order by email first	
<i>(7-16) Mostly, the change management procedure is followed as consistent as should be</i>	
<i>(x) Clearly defined verification and validation system as many variations occur in the quality management processes</i>	
(x) Separate regular variations meetings	
Could be done better to create efficient and effective CM process (score 2-2.5)	
(1) Change management objectives aligned regarding the procedure, but not regarding the results	
(1) No mutual risk management objectives regarding the results	
<i>(3) Ultimate risk allocation is unclear due to good faith</i>	
<i>(3) The Contractor could not include all his risks in the risk allowance due to the lowest price tender</i>	
<i>(3) Risks are allocated to the party best able to manage them, except for the geotechnical conditions</i>	
(4) Both parties are responsible for their own risk management, but the Employer helps out if needed.	
(4) The risk management approaches of both parties were not aligned.	
(4) Risk management is not closely related to change management	
(7) EWs given by the Employer are not appreciated	
(7) Overall change management approach is half reactive/half proactive to largely proactive	
(7-16) Standard change management processes are applied to a large extent.	
(7-16+x) The change management process is not very efficient due to disagreements about the price at the lowest level and the escalations or because the Contractor did not put the variation yet.	
(15) Use of standard forms and change register to create a basic audit trail	
Creating inefficient and ineffective CM process (score 1-1.5)	
<i>(3) No risk sharing</i>	
(5+6) The parties do not create lessons learned specifically from change events, learning from changes happens informally and unknowingly. The parties only audit the adherence to the risk management procedure.	
<i>(7) The standard warning obligation and the extra warning obligation are not fully effective</i>	
(7-16) Sometimes the Contractor issues questionable variations	

BOLD = (Related to) condition of contract, ITALIC = Amendment to contract, GREY = Important aspect

28.6 Most important components according to the interviewees

Table 108: Ranking of the components by the interviewees of Drachtsterweg

Components for building and sustaining trust				Components for an efficient and effective change management process			
	97	1.	Reasonable behaviour	C	61	1.	Clearly defined change management procedure and roles/responsibilities therein
	95	2.	Trustworthiness of person: Track record, reputation, competences (financial, technical)	C	55	2.	Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.
	86	3.	Joint problem-solving				
	66	4.	Problem-solving at the lower levels				
C	61	5.	Clearly defined communication system				
	61	6.	Repeated fulfilment of communications and interactions	C	54	3.	Early warning
	59	7.	Joint goal setting	C	47	4.	Appropriate documentation of the change process
	52	8.	System for continuous improvement of the relationship	C	38	5.	Equitable risk allocation
	52	9.	Emotional investments		35	6.	Joint goal setting for change management & risk management
	36	10.	Equitable risk allocation	C	32	7.	Risk management system
C	34	11.	Trustworthiness: Culture, policy		22	8.	Learning from changes and sharing this knowledge
	28	12.	Trustworthiness of organization: Track record, reputation, competences (financial, technical)				

29. Forres: Interview questionnaire

Opening (09.00 – 09.15u)

- Brief introduction (role/function)
- Explain research (subject, case study design)
- Explain interview setup (goal, duration, question setup)

Questions trust (09.15 – 10.05u)

Q1.Q2. Trustworthiness

Trustworthiness	(1) Seek partner with good track record, reputation and competence of financial and risk management
	(2) Seek partner with similar culture/policy
	(8) Reasonable behaviour (=working fairly and professionally)

2. The first questions concern the procurement of the contractor? Were you involved in the procurement phase? (Continue if YES)

09.15 (1)+(2) According to the Moray Flood Alleviation Group's report on the procurement, the procurement route consisted of several stages. The first stage concluded with a long list of nine Contractors which were invited to submit a response to the exercise of the second stage. The purpose of this exercise was to short list up to five Contractors that have demonstrated: Capability to contribute towards collaborative working (including in the Design), Relevant experience and a forward thinking culture, Project management ability and familiarity with partnering, target cost contracts and pain / gain share, and Cultural convergence with the Moray Flood Alleviation Group and the ability to jointly deliver all the project objectives. Subsequently, the short listed candidates were invited to submit a price and quality bid in the final tender stage.

5. OG: Were these tender stages sufficient to determine the Contractors' trustworthiness (ability, benevolence, integrity, predictability and reliability) to carry out the project?
6. ON: Were these tender stages sufficient to demonstrate the Contractors' trustworthiness (ability, benevolence, integrity, predictability and reliability) to carry out the project?
7. The procurement was mainly focused on the organizations. Did the Employer also do research at the personal level by looking into the trustworthiness of the Contractors' representatives?

'Ability refers to the other party's capabilities to carry out her/his obligations (in terms of skills and knowledge). Benevolence reflects benign motives and a personal degree of kindness toward the other party, and a genuine concern for their welfare. Integrity involves adherence to a set of principles acceptable to the other party, encompassing honesty and fair treatment, and the avoidance of hypocrisy. Predictability relates specifically to consistency and regularity of behaviour'.

>go to Q4 objectives

09.25 (8) This question covers reasonable behaviour. Clause 10.1 states that the Employer, the Contractor, the Project Manager and the Supervisor, (and Adjudicator) shall act in a spirit of mutual trust and co-operation. Clause X12.3 states the same thing, but for the Partners.

1. Do these two clauses have an influence on the behaviour of the Employer, the Project Manager and the Contractor?
2. Is it clear what is meant with this clause?

According to the Contract Documentation, the law of the contract is the law of Scotland and is subject to the jurisdiction of the Courts of Scotland. Scots law is a mixed legal system containing civil law and common law elements and includes the principle of good faith.

3. Does this principle of good faith in Scots law have an influence on the behaviour of the Employer, the Project Manager and the Contractor?
4. Do the joint project objectives with regard to the relationship have an influence on the behaviour of the Employer, the Project Manager and the Contractor?

Q3.Q4. Objectives

Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)

09.20 (3) This question deals with the project objectives. The MFA's mission statement and project objectives are included in the Project Management Plan. In addition, a Charter was signed with regard to Health, Safety and Environment. Project objectives were aligned with regard to the project results, the procedures and the relationship.

3. Do the Employer, the Project Manager and the Contractor comply with these project objectives up to now?

According to the Contract Documentation, Option M (X15) is included in the Contract which limits the Contractor's liability for his design to reasonable skill and care. In other words, the design does not have to be on the basis of fitness for purpose.

4. Why did they choose to include this Option? (RHDHV is the main designer, but Contractor is responsible for part of the design work?)

>back to Q1 trustworthiness

Q5.Q6. Communication

Communication	(4) Clearly defined system of communication procedures and approaches
	(9) Repeated fulfilment of communications/interactions

09.35 (4) The next two questions deal with communication between the Employer and the Contractor. In the Project Management Plan, plans were drawn up for communication and information between the Employer and the Contractor during the project. These include the templates, the circulation of correspondence, the meeting schedule, and the progress reports.

2. Do the Employer, the Project Manager and the Contractor comply with these communication and information plans up to now? (Do these work well or are there any problems?)

Communication is also covered in NEC2 ECC in clause 13. Pursuant to this clause, communication must be in a form which can be read, copied and recorded, writing must be in English, the period of reply is two weeks, and a notification must be communicated separately. In addition, this clause sets out rules for replying to communication and the issuing of certificates.

3. Do the Employer, the Project Manager and the Contractor comply with this clause up to now? (Does it work well or are there any problems?) (administrative burden if strictly followed?)

09.40 (9) Besides formal communication, informal communication is also very important in projects.

2. Do the Employer, the Project Manager and the Contractor also have informal contact with each other? (Co-location, Informal meetings, telephone?)

Q7. Problem solving

Problem solving	(5) Adopt joint problem-solving philosophy
	(10) Problem-solving to mutual satisfaction at the lower levels

09.45 (5) + (10) This question deals with problem-solving. Clauses 60-65 in the NEC2 ECC deals with claims from the Contractor in the form of Compensation Events. The Project Manager plays an important role in the CE procedure. Pursuant to clauses 90-93 (W1&W2) and Y(UK)2, disputes may be referred to the Adjudicator. If the dispute is still not resolved, it may be referred to the tribunal, which according to the Contract Documentation is arbitration, unless both parties agree to litigation in the high courts.

5. Do the Employer, the Project Manager and the Contractor comply with these clauses up to now? (Do they work well or are there any problems?) (Impartiality PM, a lot of CEs and EWs unmanageable, competences Adjudicator/Arbitrator)
6. xDo the Compensation Events have an influence on the trust level between the Employer and the Contractor?
7. What do the parties do during the project in order to solve problems by amicable agreement? (16.1 Early warning/10.1 Collaboration/Mutual help/Escalation to management?)
8. Are all problems resolved by amicable agreement up to now? (What about escalation to management?)

Q8. Risk allocation

Risk allocation	(6) Draft a clear, unambiguous and equitable contract

09.50 (6) This question covers the risk allocation. According to the PMP, a risk workshop was held to identify and to evaluate contract risks, to apportion risk responsibility and ownership, and to quantify defined and overall risk costs. According to clause Z11, the client risk register was developed jointly between the Employer and the Contractor and contains both Employer's and Contractor's risks specific to this project. These risks are additional to the risks stated in clause 80.1 and 81.1 in the NEC2 ECC. Risks which are not carried by the Employer are carried by the Contractor.

1. Is this risk allocation between the Employer and the Contractor in the contract clear? (Does it work well or are there any problems?)
2. How did they determine the ownership of the risk? Did they allocate risk as much as possible to the other party or did they allocate risk to the party best able to manage it?

According to the Contract Documentation, Option C was chosen, which means that the Employer and the Contractor share the financial risk.

3. Why did they choose to apply Option C instead of the other Main Options?
4. Do the Employer and the Contractor share any other risks in terms of liability? (Sharing losses and benefits, How many risks are shared?)
5. Does the party receive a reward for carrying the risk? (Contractor's risks included within the target costs? New risks?)

Q9. Continuous improvement

Continuous improvement	(7) Agreed system for achieving continuous improvement of the relationship (11) Emotional investments (e.g. by formalized team building workshops)

09.55 (7)+(11) This question concerns the continuous improvement of the relationship between the Employer and the Contractor. According to the Project Start Up Meeting Report, an initial team-building event took place in the form of a joint lunch. Besides this fact, I could not find anything else with regard to this aspect in the NEC2 ECC and in the project records.

3. Have there been any other meetings or workshops for the purpose of improving the relationship between the Employer and the Contractor? (Did everybody participate well/Do the parties comply with the new agreements?)
4. Did the Employer and the Contractor agree on a system or on certain measures for the purpose of improving their relationship during the project?

Q10. Other systems or processes

10.00 So far, the questions were all related to systems or processes found in literature which are relevant to build and sustain trust between the parties. (see 1.4 for list components)

2. Are there any other systems or processes in this project which are relevant for building and sustaining trust between the Employer and the Contractor?

Questions change management (10.05 – 10.40u)

Q1. Objectives

Anticipate change	(1) Align project goals and objectives

10.05 (1) The first question deals with the objectives with regard to change management. Change management objectives were aligned between the Employer and the Contractor and are stated in the PMP. These objectives are: 'Design changes after target cost setting kept to a minimum other than to accommodate exceptional or unforeseen events or cost saving opportunities' and 'Procedures in place to deal with early warning and change management'.

1. Do the Employer, the Project Manager and the Contractor comply with these project objectives up to now? (The pain/gain mechanism may be an incentive for the Contractor to issue a lot of CEs to increase the target cost)
2. Did the Employer and the Contractor also align objectives with regard to risk management? Are they complying with these up to now?

Q2. Risk allocation

Anticipate change	(3) Agree on project philosophy with regard to risk allocation and type of changes to consider

See Q5 trust.

Q3. Risk management

Anticipate change	(4) Prior identification of areas where changes likely occur (e.g. by risk management)

10.10 (4) This question concerns risk management. According to the PMP, the client risk register identifies risks, ownership of those risks and actions and will be maintained by the Project Manager. Risk review meetings are attended by the Project Team and are held to monitor risk mitigation actions, to identify opportunities, to plan for future risks, to record actions and to update the register and estimate costs. The risk review meeting seems to be similar to the 'early warning meeting' stated in clause 16.2 and 16.3 in the NEC2. The risk register was not yet included in the NEC2, but it is included in the NEC3 (clause 16.1).

4. Do the Employer, the Project Manager and the Contractor comply with these risk management plans up to now? (Do these work well or are there any problems? Are the clauses in the NEC2 ECC clear?)
5. How proactive is the risk management approach by the Employer, the Project Manager and the Contractor during the project? (proactive=anticipate and identify risks in advance and try to minimize the impact) (5-point scale: entirely reactive, largely reactive, half reactive/half proactive, largely proactive, entirely proactive)
6. Does risk management play a role in the change management procedure? (e.g. to identify areas where changes likely occur?) (Link with CEs and programme clear in the clauses 3 and 6?)

Q4.Q5.Q6. Change management procedure

Anticipate change	(2) Clearly defined change management procedures and processes and roles and responsibilities therein (3) Agree on project philosophy with regard to risk allocation and type of changes to consider
Recognize change	(8) Early identification of potential changes (9) Standard change management process: Assess potential impact (e.g. by value engineering) and create a proposed change order (10) Standard change management process: Document the proposed change in a log
Evaluate change	(11) Standard change management process: Determine priority of the change (12) Standard change management process: Selection of optimum change options by consulting all relevant parties

	(13) Standard change management process: Identify the likely impacts of different change options
	(14) Standard change management process: Prompt decision making with due authority as to whether to accept/reject the change
Resolve change	(15) Standard change management process: Communicate final change decision to all team members whose work is affected by it
	(16) Appropriate documentation to record all decisions within the change process
Monitor implementation	(5) Monitor and record implementation

10.15 (2) + (3) The following questions cover the change management procedure. According to the PMP, the clauses 60-65 in the NEC2 ECC must be applied for dealing with change. These clauses describe the Compensation Event procedure. In addition, the PMP lays down two rules for change management: Changes can only be implemented by a PM's instruction, and The Project Team may initiate a change by submitting a proposal, but a proposed change can only be implemented after the Project Director's approval and the PM's instruction.

5. Why were these two rules added to the Compensation Event procedure? Are the clauses in the NEC2 ECC not clear or not complete with regard to change management?

Furthermore, project registers are maintained by the Contractor which is a log to record CEs, EWs, Notifications etc.

6. Why do you keep project registers? Which problems are solved or avoided with this tool?
7. Do the Employer, the Project Manager and the Contractor comply with this change management procedure up to now? (Do it work well or are there any problems?/Are all sub clauses in 60-65 applied or are some of these omitted?/Other improvements?)
8. xHow efficient and effective is this change management procedure? (Processes in NEC2 ECC clear, roles and responsibilities clear, type of changes clear?)

10.20 (8) According to clause 16.1 in the NEC2 ECC, the Contractor and the Project Manager must give an early warning by notifying the other as soon as either becomes aware of any matter which could increase the total of the Prices, delay Completion or impair the performance of the works in use.

5. Does this Early Warning obligation play a role in the change management procedure? (e.g. early identification of potential changes) (Is this clause in the NEC2 ECC clear?)
6. How proactive is the change management approach by the Employer, the Project Manager and the Contractor during the project? (proactive=anticipate and identify changes in advance and try to minimize the impact) (5-point scale: entirely reactive, largely reactive, half reactive/half proactive, largely proactive, entirely proactive)

10.25 (5) + (9-16) The compensation event procedure in the NEC2 ECC does not mention all the actual steps taken to implement a scope change. Therefore I have a question about this. The question concerns all change management processes at both the Employer's and the Contractor's side. I will mention some standard processes which are usually included in a change management system. Then you just have to answer if these processes are included in the your change management system or not.

Recognize change	8. Before the change takes place, assess potential impact and create a proposed change order	x
	9. Document the proposed change in a log	x
Evaluate change	10. Determine priority of the change	-
	11. Selection of optimum change options by consulting all relevant parties	x
	12. Identify the likely impacts of different change options	x
	13. (Prompt) decision making as to whether to accept/reject the change by someone with authority	x
Resolve change	14. Communicate final change decision to all team members whose work is affected by it	x
	15. Appropriate documentation to record all decisions within the change process	x
Monitor implementation	5. Monitor and record implementation of the change	-

Q7. Continuous improvement

Learn from change	(6) Conduct a review and create lessons learned from the change event
	(7) Update shared databases and incorporate lessons learned for project and organization

10.30 (6)+(7) This question covers learning from changes. According to the PMP, lessons learned were created from the previous Flood Prevention Schemes which includes some recommendations regarding change management. I could not find anything else with regard to this aspect in the NEC2 ECC and in the project records.

- Do the Employer and the Contractor create 'lessons learned' from change events during the project? (e.g. evaluation, root cause analysis?)
- Do they share this knowledge with each other?
- Do the Employer and the Contractor measure the performance (efficiency and effectiveness) of the risk management processes during the project? And adjust these if needed?

Q8. Other systems or processes

10.35 The previous questions were all related to systems or processes found in literature which are relevant to create an efficient and effective change management process. (see 1.4 for list components)

1. Are there any other systems or processes in this project which are relevant for creating an efficient and effective change management process?

Additional questions are irrespective of the project (10.40 – 10.55u)

10.40 TRUST:

1.	Trustworthiness of organization: Track record, reputation, competences (financial, technical)
2.	Trustworthiness of person: Track record, reputation, competences (financial, technical)
3.	Trustworthiness: Culture, policy
4.	Reasonable behaviour
5.	Joint goal setting
6.	Clearly defined communication system
7.	Repeated fulfilment of communications and interactions
8.	Joint problem-solving
9.	Problem-solving at the lower levels
10.	Equitable risk allocation
11.	System for continuous improvement of the relationship
12.	Emotional investments

Q11. Effectiveness of the systems or processes

3. Which systems or processes are most effective for building and sustaining trust between the Employer and the Contractor?

Q12. Trust clauses in contracts

3. Which systems or processes would you include in the Contract with regard to trust between the Employer and the Contractor?

10.45 CHANGE MANAGEMENT:

1.	Joint goal setting for change management & risk management
2.	Equitable risk allocation
3.	Risk management system
4.	Clearly defined change management procedure and roles/responsibilities therein
5.	Early warning
6.	Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision, and monitor change.
7.	Appropriate documentation of the change process
8.	Learning from changes and sharing this knowledge

Q9. Importance of the systems or processes

3. Which systems or processes are most important for creating an efficient and effective change management process?

Q10. Change clauses in contracts

3. Which systems or processes would you include in the contract with regard to change management?

10.50 INFLUENCE:

Q11. Influence of trust on effectiveness and efficiency of change management process

The subjects 'trust' and 'changes' were deliberately chosen for this research. The main objective of the research is to determine the influence of the trust level between Employer and Contractor on the effectiveness and efficiency of the change management process. I have written down the definitions of 'efficiency' and 'effectiveness' on this piece of paper. The questions are also on the paper.

Efficiency is an indicator of the resources that were consumed to reach the level of achievement = $\frac{\text{actual efforts}}{\text{normative efforts}}$

Effectiveness is an indicator of the degree of a goal attainment = $\frac{\text{actual performance}}{\text{normative performance}}$

5. How many % of the efficiency of the change management process is influenced/determined by the trust level between the Employer and the Contractor?
6. How many % of the effectiveness of the change management process is influenced/determined by the trust level between the Employer and the Contractor?

(0% no influence, 25% little influence, 50% much influence, 75% very much influence, 100% complete influence)

Closing (10.55 – 11.00u)

- Interview report and validation
- Report will be included in the annex of the final report
- Name in the report or anonymous?
- May I email you if I have additional questions?
- Final report will be sent to all participants
- Any suggestions to improve the interview?

30. Forres: Interview reports

INTERVIEW REPORT #1E

Interview:	Project Forres (River Findhorn & Pilmuir) Flood Alleviation Scheme
Date of interview (DD/MM/YYYY):	31-10-2014
Time:	10.00 – 12.00h
Location:	Meeting Room 3 of The Moray Council Annex (High Street, Elgin)
Interview planned by:	Lonneke Cheung
Date of report (DD/MM/YYYY):	26-01-2015
Validated (DD/MM/YYYY):	09-01-2015 (deemed acceptance)

1. Attendees				
Initials	Name	Role/Function	Company	Email
LC	Lonneke Cheung	Graduate Intern	TU Delft/RHDHV	-
DG	David Gowans	'The Employer'	The Moray Council	-

2. Answers given to questions regarding 'trust':	
Trustworthiness during procurement	
- Most contractors have good systems, good people and can technically do the job. Therefore, what you want to know is who is going to work with you and who can you trust most. - The tender stages were sufficient to demonstrate the contractors' trustworthiness (i.e. ability, benevolence, integrity, predictability and reliability) to carry out the project. The setup of the procurement was not without risk, because there is the risk that the Employer might get it wrong as the contractors knew what the Employer was looking for and usually they are very good in filling in these quality submissions. Therefore, in the final tender stage the Employer conducted interviews on site at their location to spot the flaws by checking the consistency between their submissions and their behaviours on site. For example, the Employer checked whether they really meant what they said and whether everyone in the organization speaks with the same view. The interviews were quite revealing as some contractors were not very consistent. - The Employer conducted similar interviews with the Consultants. - Culture was the most important factor in the procurement of the Contractor and the Consultants. The Employer wanted to know things about the organizational culture, for example, how people related to each other, what was the power distance in the organization and how were people enabled. - The Employer wanted to meet the people who were actually going to be working on the job instead of the marketing people.	
Reasonable behaviour	
- Clauses 10.1 and X12.3 in the NEC2 ECC (spirit of mutual trust and co-operation) have an influence on the behaviours of the Employer, the Project Manager and the Contractor. It is something that is always on the background, but it is not something the parties discuss every day. It forms a good start of a contract, but building trust is more dependent on the formation of the Project Team. If the parties in the Project Team do not build trust, the Employer has to intervene with, for example, workshops or trying to change people's behaviours. - The Employer had to intervene on the first project. I had to talk to some people, which sometimes feels like talking to school children and telling them to behave. - Interventions were not needed very often and it has been some time since the last one. Everybody knows each other too well and it comes to a point that all parties become dependent on each other and have to work not to let each other down. - On this project, the main weakness has been the Design Consultant, because the design work was delivered late, which probably was the biggest problem we have had so far. - It is clear what is meant with clauses 10.1 and X12.3 in the NEC2 ECC and the clauses are good, but it is <u>not</u> clear how these could be enforced. For example, how could you go to the Contractor and say: 'I do not consider that you are trusting me or that you are not co-operating with me'. - The principle of good faith in Scots law has an <u>indirect</u> influence on the behaviours of the Employer, the Project Manager and the Contractor. Good faith is in line with trust and the two are pretty similar. It would be difficult to say that Scots law has a direct influence, but it does indirectly through culture. I do not think people have a full knowledge of the basis of the Scots law, but maybe good faith is something in the back of people's minds as the culture of Scotland may be slightly different than England's in terms of different legal systems and legal principles. In Scotland, people are expected to act in good faith. - The joint project objectives with regard to the relationship in the project charter have an influence on the behaviours of the Employer, the Project Manager and the Contractor. As a Project Team we have set values, such as integrity, openness etc. Such things do have an influence, because you can probe people back to that. - For example, one time people seemed to have lost interest in the projects, so the Employer did a survey to check how people lived up to the objectives and values. A lot of surveys will not be effective as people will get bored of filling them out. In addition, surveys are only useful if the Project Team has not been fully integrated yet. After a number of years, it becomes a bit childish to conduct surveys. - I do see a challenge coming now as the flood programme is reaching its end. I will have to become more involved to keep the Project Team from becoming too relaxed and disintegrated in order to finish the project strongly.	
Project objectives	
So far, the Employer, the Project Manager and the Contractor have <u>to a large extent</u> complied with the project objectives stated in the Project Management Plan and the Charter, because it would be wrong to say these things go perfectly. Most of the time the parties seek solutions and solve problems as a team, rather than finding out who is to blame and is going to pay for it. It helps that the parties are working together on several projects so that the costs of any project problems are very low compared to the overall flood programme costs of 170 million pounds and are not really worth arguing about. It also helps that one of our goals	

is to make the projects commercially successful for all parties. For the Employer this would mean that the projects are delivered on time and budget. ▪ We have had to take actions from time to time. For example, on the first project (Mosset), it was the first time that we had Early Contractor Involvement and a negotiated target cost, but on site it quickly became a traditional contract and the parties were not working as a team (e.g. company signs on the doors, the barriers came up, unjustified CEs and arguments over the programme). So we had to deal with that in order to make people to work together. ○ Regarding the culture, we took down the signs from the doors and at least one person was taken away from the project because he was fundamental in creating that atmosphere. ○ Regarding the contract, we amended the contract for the next flood projects (Elgin and Forres) because some aspects took too much time to process. We took out the preliminary section from the pain/gain share mechanism (i.e. the site overhead costs for e.g. the offices, the staff and the vans). A CE consists of a programme implication and a costs implication. If the site overhead costs are included, it becomes complex to determine the CE's impact on the target cost. So to promote team working and to save on administration costs, we decided to make the site overhead costs (about 25% of the total costs) cost reimbursable rather than to include these in the pain/gain share mechanism. Site overhead costs are not work costs, the pain/gain share is restricted to the works costs only. All parties have a moral obligation to reduce the site overhead costs, which has happened as far as I am aware. There is no real advantage to the Contractor in having staff unless they have nothing else for them to do, which is not the case to have staff on the site. ▪ Option M (limitation of Contractor's liability for his design to reasonable skill and care) was chosen because RHDHV is the main designer. The Contractor's design work is very limited. RHDHV does have to deliver a design which is 'fit for purpose' and is liable for the design if something goes wrong. It is not a D&B contract, but there was Early Contractor Involvement (ECI), so the Contractor does have influence on the design. ECI was applied to reduce the design costs by foreseeing as many problems upfront as possible. The Contractor is an advisor for the construction implication of the design and gives advice on ways to perform better, to reduce costs, to build it safer, and on how to build it (e.g. access to the site, space on site and which plants can be used).	Communication
▪ I do <u>not</u> know if the Employer, the Project Manager and the Contractor have complied with the communication and information plans stated in the Project Management Plan up to now. I am <u>not</u> directly involved in this, but overall the parties have complied with these plans. Sometimes CEs can lag, which means that CEs submitted by the Contractor have not been evaluated by the Cost Consultant quickly enough. It is something we have raised to our Strategic Steering Group. On the Forres project, it is not really a problem. On the Elgin project, it is a problem since it is a more complex scheme. As a result, there are far more CEs. ▪ I do <u>not</u> know if the Employer, the Project Manager and the Contractor have complied with Clause 13 in the NEC2 ECC (communication). I am <u>not</u> directly involved in this, but broadly speaking they should have complied. ▪ Communication according to the NEC2 ECC and the Project Management Plan is a lot of administrative work, but it is still manageable. It is important to keep up to date with the paperwork and the NEC contract works best when the contract administration is tightly managed. We have employed the Cost Consultant to do the administrative work, which has been very helpful so far. This fourth party is independent of the Design Consultant and the Contractor. Aside from the NEC contract, it is also helpful to the Employer to know that the financial management is in the hands of a party who has no other interests, which provides a good audit for the Employer. ▪ The Employer's and the Project Manager's team use Box (a digital Document Management System). I assume this Box is also shared with the Contractor, because on the other projects all four parties also shared a server hosted by TMC. ▪ The Employer, the Project Manager and the Contractor have informal contact with each other by means of the co-location. The co-location is a very strong feature and is what I wanted. On the Elgin project, the parties also share the same office and sit opposite and next to each other. I did not want, for example, people making secret phone calls and so on. People should not be saying things they cannot say in front of the others. ▪ The Project Manager is the representative of the Employer in the office. Originally, Barbara is employed by RHDHV, but TMC felt that she was the right person to take on the Project Manager's role, because they know her so well and know that she can act in that role. So on the Forres project, Barbara is a Council's employee, has a position in the Council's structure and has an authority under the Council's financial system. On the Elgin project, the Project Manager (Peter) is and was already a Council's employee.	Problem-solving
▪ So far, the Employer, the Project Manager and the Contractor have complied with Clauses 60-65 in the NEC2 ECC (Compensation Events). The dispute resolution clauses (90-93 and Y(UK)2 have <u>not</u> been applied yet, since there have been no disputes so far which could not be resolved locally by the parties. ▪ The NEC2 ECC does <u>not</u> ask the Project Manager to conduct the CE quotation impartially, but it does say that the Project Manager has to act in the Employer's interest. However, on this project, the Employer expects a degree of impartiality and fairness from the Project Manager. The Project Manager acts on the advice of the Cost Consultant, who is also acting for the Employer, but is also expected to act fairly. The Cost Consultant discusses the quotation with the Contractor and tries to reach a resolution in the first place. Subsequently, the Project Manager signs it off. ▪ The Project Manager's only restriction on this project is that she <u>cannot</u> issue work to RHDHV, because she is also on the payroll of RHDHV. That would be a conflict of interests. Therefore I am the one who assigns additional work to RHDHV. ▪ The Compensation Events (CEs) do <u>not</u> have an influence on the trust level between the Employer and the Contractor. ○ There have been cases where CEs were disputed by the Cost Consultant, but so far all of these have been resolved. So unreasonable CEs will be challenged openly. ○ Partnering is not about being buddies or friends. That does not mean that people should not become buddies or friends, but it implies that it is not a project goal in itself. Being friends can become a problem because people need to challenge each other. You have to be able to be open and say what you think. Our Project Team has been together for a long time, so they know each other and trust each other. Therefore they can challenge each other and the receiver would not be offended. ▪ In order to solve problems by amicable agreement the parties do the following: ○ First, challenge each other, collaboration and mutual help, because it is a team. We have had a lot of problems because we are working in a difficult environment. There were more problems in Elgin than in Forres, because it is a	

much more complex scheme. Problems are not always relationship-based. Most of the problems are on site and the Project Team has to solve them together. The parties may have different view on how to do it. So the parties meet, propose ideas, debate ideas and agree on a solution. All parties work together and try to come up with innovative solutions to solve all problems they come across. For example, on the Elgin project, recently we found asbestos contaminated soil on a critical location, which affected the programme. The disposal of such soil is very expensive, so the Project Team came up with a less expensive solution. ○ Second, early warning. The EW helps to formalize it and to bring the problem to attention. Sometimes the Contractor can raise EWs which perhaps are not justified, but you would rather have that than that he did not raise them at all. Sometimes people's behaviour deviates a bit too far due to, for example, strong personalities, and start issuing EWs when they are really not justified. In such cases, picking up the phone would do just as much. ▪ Any problems which are relationship-based have to be spotted early on and intervened. For example, the Rothes project ended up successful, but the Employer had to be involved to solve some problems within the Project Team. The Project Manager employed by EC Harris and the Contractor's Construction Manager were not very honest people, were not very good in working in a team and both their attitudes deviated. The two would not want to work together. For example, even though the parties were located in the same office, the Project Manager would reject the Construction Manager's programme immediately by email without even discussing it together first. ▪ So far, all problems were resolved by amicable agreement, but some problems (e.g. disagreement about the final account on the Mosset project) were escalated to the highest level within the Project Team. The highest level is the Moray Flood Alleviation Strategic Steering Group. This group meets every two months to discuss aspects such as the progress, strategic issues related to the schemes, health and safety performance, resources, changes in resources, resource plans for the future, lessons to be learned and what to report to the Council Committee (because the projects' budget of 170 million pounds is massive compared to the Council's annual capital budget of 5-10 million pounds).	Risk allocation ▪ The risk allocation between the Employer and the Contractor in the contract is clear and is quite specific tailored to each project, but that does not mean that there are no disputes about whose risk it was, but we have not had many. The Employer's risk register are managed by everyone, whereas the Contractor's risk register are managed by the Contractor himself. So far, we have done a good job in managing the risks. Every two months we have a risk review meeting to look at what the residual risks are in the contract and we use that to predict the costs to complete. ▪ Risks are allocated to the party best able to manage them. ○ For example, the Employer takes the fuel price risk for the Elgin project, but the Contractor takes that one for the Forres project, simply because Forres is much shorter of duration. The fuel price is more uncertain over a longer period and puts limits on what the Contractor can do. The same was done for the steel price risk, the Contractor took the risk for the Forres project as it is a shorter contract and less steel was needed on that project. ○ If the risks are allocated inappropriately, it is not very cost-effective because the Contractor cannot manage every risk and to ask him to do anyway, then he can only price them quite conservatively usually. For example, the Employer could have asked the Contractor to take the fuel risk on a four-year contract for the Elgin scheme, but the Contractor can only have managed that by inflating his price because you cannot predict the fuel price in four years from now. The Forres scheme was only a two-year contract and most of the fuel would be needed early, so the Contractor could take that risk and he did. ▪ Option C (the Employer and the Contractor share the financial risk) was chosen instead of the other main options, because once you have done everything else to have the whole team working together, then Option C provides that final incentive since it is conducive to aligning objectives and reducing the costs for everyone. The Employer wanted a contract where there would be an advantage to the Contractor to be innovative and efficient, so that both parties could gain from that. ○ Option C also has its risks. The Employer understood the risk of CEs pushing up the target cost and the risk that if the Contractor is involved in the design phase, he would have a temptation to hold back innovations to later in the project. The parties dealt with these risks by discussing them, by saying just be open and by saying that the Employer is aware of the possibility that it could happen, but that the Employer wants to trust the Contractor that the best ideas get out and are included in the target costs, so that the target cost is kept down. ○ For example, on the Forres project, there was something which both parties could not have foreseen earlier. The Contractor proposed to use a sheet pile cut off wall instead of a more expensive, high risk grout curtain, but the proposal would involve vibration near properties. The Contractor was confident that he could do it in sheet pile, but I decided 'no' because of planning considerations and the consent the parties would need for the project. Later on site, the Contractor proposed it again and said he would take the costs of any trials etc. This time the proposal was accepted. During the construction, the Project Manager checked the amount of vibration by means of vibrations in a cup of coffee at a café nearby. ○ On the Forres project, the net impact of CEs is negative (i.e. a reduced target cost) due to design changes and good fortune with the weather etc. ○ On the Rothes scheme, the pain/gain share mechanism was <u>not</u> applied because the estimated Contractor's costs had increased too much due to things such as little design changes and additional works. The risk allowance for the Contractor's risks was too high because the Contractor could not manage them as there was far too many uncertainties. The idea not to apply the pain/gain share mechanism came from EC Harris. The Employer took all the risks on this project and the Contractor's percentage of profit share was increased a bit (from 2.5% to 2.75%) to compensate for the loss for opportunity to make gain share. The first estimate was 35 million pounds, which was too high and not economic. After a Project Team meeting, in one day it was 12 to 13 million pounds less, because the Employer took the risks and took out unnecessary design elements. During the project, the parties had to work on trust to keep the costs down. The project ended up 10% below budget. ▪ The design was <u>not</u> final at target cost setting. It was just in varying degrees, but the design should have been finished. The Design Consultant (RHDHV) has <u>not</u> been very good in delivering design in time. Late design has been a constant problem through the Elgin scheme, but not so for the Forres scheme since the design was dealt with by another RHDHV office and it is not such a complex scheme. The Employer sees this in the costs coming in for the design from RHDHV. The costs are much higher for Elgin than for Forres, particularly the head office costs due to the amount of design work and design change late.

▪ In theory, the pain/gain share mechanism does create an incentive for the Contractor to issue a lot of CEs to increase the target cost, but <u>not</u> on the projects. CEs are only issued for things which have to happen and CEs are purely for the works, which means that the programme implications are not taken into account. For example, it is okay if the Contractor says that he has to extend a wall with 100 meters, but it is not okay if he says that he has to extend the wall, but that it has an impact on the programme and other things, and before you know it this would mean a couple of weeks delay, because the delay would cause a major increase of the target cost due to, for example, extra costs for running the site (e.g. in Elgin it costs £50,000/week). So the Employer decided to pay the programme implications through actual costs plus fee. This decision takes the programme implications out of contention, which has been very successful. ▪ The Employer wanted to take out anything what would help the Contractor to gain at the Employer's expense and vice versa, which is done by aligning the incentives in terms of sharing risks and rewards through the pain/gain share mechanism. Besides the financial risk, the Employer and the Contractor do <u>not</u> share any other risks in terms of liability. The flood event risk contains a cut-off, so it is <u>not</u> really shared but separated. If it is a flood event up to 1 in 10 years, it is a Contractor's risk. Beyond that, it is an Employer's risk and a CE. Early on, the parties have defined it as a level on a gauge what a flood event of 1 in 10 years is, so there can be no disputes about that. On most schemes, we have had a flood event bigger than 1 in 10 years. ▪ Other things the parties do share are, for example, the offices. In addition, the parties try not to duplicate roles and to do unnecessary checking and man marking. The parties do <u>not</u> share equity. The parties did look at a shared project insurance, but it was a step too far according to our legal teams. That is probably as far as it goes in terms of sharing risks, so in that sense the arrangement is relatively traditional. ▪ The Contractor's risks are included as a risk allowance in the target price. If these risks are managed well, both parties will benefit from it through the pain/gain share mechanism. New risks are for the Employer and will be inserted in the risk register. For example, due to the flood event, new risks emerged or existing risks extended. New risks have not been a great deal, partly because there is already a risk allowance for unforeseen risks in the risk register.
Continuous improvement of the relationship
▪ There have <u>not</u> been so much formal meetings or workshops for the purpose of improving the relationship between the Employer and the Contractor of late. There have been some social event, but we do <u>not</u> label them as team building events. For example, on the Elgin project, the Contractor invited the staff of the other parties for dinner and drinks at an Indian restaurant. ▪ The Employer and the Contractor did <u>not</u> agree on a system or measures for the purpose of improving their relationship during the project. We really have <u>not</u> had a need to. You have to be careful about these things, because these kind of behavioural workshops are good when you need them. If you have a team building workshop when the team is already working well, it is like taking children back to school and it is almost patronizing to say that we are going to have a team building workshop. The team may even be insulted by having it.
Other systems or processes
▪ Other systems or processes than the ones that were already given (see last page) which are relevant for building and sustaining trust between the Employer and the Contractor in this project are: ○ Allow the team to act as a team. This is important because of the long-term nature of the flood programme. We have to show the public that we all have the same identity. We use the MFA as a badge. ○ Present ourselves as a team at the public Council's Committee meeting. The representatives of all four parties of each project gathered to face the Councillors and take their questions, which was quite innovative as normally it would only be Council's Officers. This approach was very successful because the Councillors, the public and the press got to know the Project Teams. Unfortunately, two years ago, TMC got a new director who did not allow this anymore. ○ Corporate social responsibility. The parties communicated directly with Councillors and have helped out massively when there were emergencies, for example, flood events and snow events. ○ Lower barriers for communication with the Councillors, which was only possible because of the long-term nature of the flood programme and the low turnover in staff of all parties. It helps if the Councillors know and talk to the Project Team, because the Councillors can be very suspicious and might think that the parties are paid too much since they work for a commercial company are only in it to make profit. The latter may be true, but this does not mean that the parties do not provide value to the Council. ○ Lessons learned from the previous flood schemes. The lessons learned workshops have been tight team building events as well because of the geographical dispersion of the parties. What we also did was, for example, for the Rothes lessons learned we brought in the Forres design team so that they could hear first-hand the things which had gone well or badly and the way things could have been done better. The lessons learned have also been valuable for changing the contract style and evolving the contract. ○ Consistency of costs. All costs were based on the Contractor's costs all the way through, which is valuable because these estimates are more accurate than the Employer's and any changes can be explained more easily.
3. Answers given to questions regarding 'changes':
Project objectives
▪ So far, the Employer, the Project Manager and the Contractor probably have complied with the change management objectives stated in the PMP. I am <u>not</u> directly involved in this. We know that the Contractor has a tendency to come up with good ideas, but we are very wary of this because good ideas can cause you so much in other forms (e.g. in delay and extra design fees), so that you end up worse than you would originally. For example, on the Elgin project, there is a major architectural bridge. We have built into the sub contract from the steel fabricator a requirement to value engineer the design. Subsequently, some design changes were made, but we saved money at the end of the day. ▪ The Employer and the Contractor did align objectives with regard to risk management, because we manage the risks together and the risk reviews are carried out by the whole Project Team (i.e. the Employer, the Project Manager, the Contractor, the Design Consultant and the Cost Consultant). The idea is that the whole team succeeds or fails and that we do not want one party succeeding at the expense of the other. We sit down together and discuss how we foresee future risks and manage them together, because we have a joint interest to make the outcome predictable since unpredictable outcomes affect the reputation of all parties.
Risk management

- So far, broadly speaking the Employer, the Project Manager and the Contractor have complied with the risk management plans stated in the PMP and in Clause 16 in the NEC2. I do <u>not</u> know whether the parties have complied with the PMP perfectly, because I am <u>not</u> closely involved in the project day-to-day and I have <u>not</u> read the PMP for a while. It is really important that the parties manage the time and the costs of the projects due to their reputations. Their reputations have enhanced because the parties have been able to predict where they are going. It does not matter whether it is good or bad news, what matters is that the parties have detected it early and reported it. - The risk management approach by the Employer, the Project Manager and the Contractor during the project is <u>largely proactive</u>. Nothing can be entirely proactive, because risks emerge and you have to react. Risk management always is slightly reactive because you can only base the future on what you know. Therefore, by definition you are reacting to the information that has arrived. The proactive part is what you do to manage it and to reduce the risk. The joint risk management approach on this project works, because as far as I am aware, the project is commercially viable for all the parties and is under budget. - Risk management plays a role in the change management procedure, because if a risk changes or emerges and the parties decide to take a different action, then that automatically becomes an instruction which would trigger a CE. If you want to manage the risks instead of just allowing more money, you have to use risk management to identify areas where changes are likely to occur. First, you should check the probability and impact to determine how much you can allow to go wrong. Second, you should check what you can do to manage it and to reduce the probability and impact. If changes are needed, you should make provisions for that.	
Change management procedure	
- I do <u>not</u> know why the rules for change management in the PMP were added to the Compensation Event procedure. I am surprised that the PMP states that design changes initiated by the Project Team require an approval from the Project Director. In reality, the requirement of the Project Director's approval depends on the scale of the design change. For example, when the Contractor proposed the sheet pile wall to the Project Manager, it was a major change. It took a long time to evaluate the change because all sort of things had to be considered. Eventually, the Project Manager would issue the change as an instruction once it was all agreed. The Contractor's proposal ultimately comes over as an instruction, but it is not a CE because it brings the actual costs down and the Contractor will be rewarded for it by means of the gain share. - I do <u>not</u> know why the project registers are kept. I am <u>not</u> directly involved in this. - So far, the Employer, the Project Manager and the Contractor have complied with the change management procedure. The only issue I am aware of and which has been reported to the Strategic Steering Group is that CEs are lagging on the Elgin scheme and that measures have been taken to improve that situation. On the Forres project, keeping up with the CEs, the quotations, the checks etc. has been the most onerous part of the procedure. That is why not looking into the programme implications in terms of costs for delay has reduced the amount of administrative work considerably and thus made the procedure more efficient. - I do <u>not</u> know if all sub clauses in 60-65 are applied for dealing with change and if these clauses are clear. I am <u>not</u> directly involved in this. - I do <u>not</u> know whether other improvements have been made to the change management procedure. I am <u>not</u> directly involved in this. - The Early Warning obligation stated in clause 16.1 in the NEC2 ECC plays a role in the change management procedure. Frequent EWs on the Elgin scheme have been that the delay in receiving all the detailed design drawings from the Designer have the potential to delay the scheme. Such EWs do <u>not</u> result in any changes, but are dealt with by phoning the Designer or the Project Manager. Other EWs are raised when something is wrong in the design and a change is needed. - It is quite clear what is meant with the 'aware' part in clause 16.1 in the NEC2 ECC, because the NEC is written in reasonably plain language. However, you have to read the NEC in the spirit of things meaning what they would ordinarily mean. Everything has to be taken within the terms of reasonable and that is how the whole contract was intended. - The change management approach by the Employer, the Project Manager and the Contractor during the project is <u>largely proactive</u>. The overall feel is quite good as change management is operating quite well. I am <u>not</u> directly involved in this on a day-to-day basis. The Contractor does highlight things early in particular. It helps that there is trust between the parties. The Contractor is raising these things because they are genuine concerns and the aim is to avoid any adverse impacts. It is not in the Contractor's interest for the job to be inefficient since finishing the project as early as possible will benefit both parties. - I do <u>not</u> know if the following processes are included in the change management system and are performed by the Employer, the Project Manager or the Contractor. I am <u>not</u> directly involved in this.	
9.	Before the change takes place, assess potential impact and create a proposed change order
10.	Document the proposed change in a log
11.	Determine priority of the change
12.	Selection of optimum change options by consulting all relevant parties
13.	Identify the likely impacts of different change options
14.	(Prompt) decision making as to whether to accept/reject the change by someone with authority
15.	Communicate final change decision to all team members whose work is affected by it
16.	Appropriate documentation to record all decisions within the change process
5.	Monitor and record implementation of the change
Remarks: CEs can be generated by something that has happened or an instruction. The Contractor assesses the impact and submits that to the Cost Consultant. The Cost Consultant evaluates it and agrees, disagrees or amends it. Both parties come to some form of solution of what the impact of that CE is and that goes into the CEs register, which affects the target costs. The CEs are tended to be assessed retrospectively because some of these are quite substantial. When it comes to me, I have a guy who works for me (an accountant, but he is not employed as an accountant). He balances the total value of CEs and the new target cost against the reduction in risk across the project as time goes. So the costs to complete the project is always being evaluated and the CEs process is central to that.	
Learning from changes	
The Employer and the Contractor do <u>not</u> create 'lessons learned' specifically from change events during the project, but the parties have done lessons learned workshops across all sort of things, so they probably did learn something from the change management process. Although, the parties still have the problem of CEs lagging as there are too many CEs out there which have not been evaluated yet by the Cost Consultant. Elgin has the most lagging CEs, whereas Forres has some. There have <u>not</u> been	

so many CEs for Forres. Elgin has had far more because it is a much more complex scheme and its duration is longer. The individual CEs are also much larger, so they reflect much bigger changes. - Further, there was a lot on the Elgin scheme the parties could <u>not</u> predict. Therefore the scheme contains much more 'substitution events', which is where a CE was generated by the activity being defined, where in the target cost it was not and there was merely an allowance cost for it. On this scheme there was about 7 million pounds worth of allowance because the parties did not know the detail. The allowances are not the same as the risk allowances, because it is certain that these are gradually replaced since the parties did know it was going to happen, but just not how. The parties had to do this to get on with the job instead of forever try to refine the design. During the construction, the parties can deal with this more easily by means of the CE process. There have been a lot of CEs on the Elgin scheme, but not all of these increased the target cost as they merely replaced the allowance cost. - The lessons learned workshops are conducted together and thus the lessons learned are shared between the parties. - The Employer and the Contractor do <u>not</u> measure the performance (efficiency and effectiveness) of the risk management processes during the project and adjust these if needed. The parties do measure the cost predictability of the project and the reliability of the target cost.	
Other systems or processes	
	- Other systems or processes than the ones that were already given (see last page) which are relevant for creating an efficient and effective change management process in this project are: the collaboration with Scottish Government who provides the grant funding of the projects. - Therefore, we have to make sure that the cash flow is working. We use the risk management and the CE processes to inform the Council's financial management processes, particularly in terms of the capital expenditure (CAPEX) because the Council is audited. So there is a risk of bad publicity and extra work to recover from bad audit reports from government auditors. We use the change management process to feed into the higher level by means of a structured meeting between the Project teams (Project Director, Project Managers, Cost Consultants and accounting colleagues) and the Council's finance department every two months. The Project Teams discuss the risk management processes with the Council's accountants. Subsequently, the accountants can report to the Council's Policies Committee and Resources Committee on the CAPEX in order to re-profile the CAPEX and to re-align with the Government so that they can manage their CAPEX. Hence, the change management process can be used to help smooth the financial side of the project, which helps to reduce the risk of bad publicity and poor reputation for not managing money and helps us to ensure that the flow of money from government is good. - For example, regarding the funding for the Elgin scheme, we used the risk management process to manage risks at a strategic level and to demonstrate to other funding partners that we were actually managing the risks. At the start of the Elgin scheme, there were political issues regarding the funding mechanisms and the scheme was not receiving the funding, which had nothing to do with Elgin, but it was a national thing as they changed the system. Four years ago I had a meeting with Government ministers and our own politicians. At the request of our own councillors the ministers agreed to offer the Council up to 7.6 million pounds additional grant (subject to various conditions). Now is the time to get that money. What the Government minister wanted to know is whether the Council had done everything possible to control the costs. I was able to go back there and outline our whole cost management and risk management processes and submit that to Government. Their response was that they were happy with this and that they would pay us the money.

5. Answers given to extra questions regarding 'trust' and 'changes' (irrespective of the project)	
Ranking of the most effective systems or processes for building and sustaining trust between the Employer and the Contractor (C = include in the contract as aspirations):	
	- Joint goal setting - Trustworthiness: Culture, policy - Emotional investments - Trustworthiness of organization: Track record, reputation, competences (financial, technical) - Trustworthiness of person: Track record, reputation, competences (financial, technical) - Equitable risk allocation - Clearly defined communication system - Repeated fulfilment of communications and interactions - System for continuous improvement of the relationship - Joint problem-solving - Reasonable behaviour - Problem-solving at the lower levels
C	- Remarks: - I think the place for trust is <u>not</u> in the contract. It is important in the procurement process so that you have people you can work with confidentially. People are products of their own environment, which forms their culture and so on. If you have the wrong people, they may be good at working on other projects, but not on your one because they do not comply with what you are requiring from them. A lot of people are good at things, but if you want to run a project in a certain way because you think this project is, for example, complex which needs a lot of ideas, innovations and space for people to think, then you have to have a properly engaged team. Some people may not fit that model, but they probably will be perfect for straightforward projects. - In terms of the contract, the general ethos of a contract should be one of fairness and equity. It should not be power-based, otherwise the contract would encourage wrong behaviours. For example, in the ICE contracts, the Engineer was placed in a position of power as his decision was final. In addition, the Engineer was intended to act impartially, but he was appointed by the Employer. In reality, the Engineer was the Employer's representative. The NEC is better because it does not pretend that the Project Manager is impartial. Equity and clarity in the contract is important, so that everyone knows where they stand and to leave little room for disputes. - A project charter is post-contract behavioural document and is <u>not</u> a contract document.
C	
C	
C	
C	

○ Aspirations are things you would seek to bring into the contract, but the contract <u>cannot</u> define these in most cases. So the aspirations show how you would want them to be developed and work. ○ During procurement, you set out the vision for the contract. These aspirations can be used to assess the tenders.	
Ranking of the most important systems or processes for an effective and efficient change management process (C = include in the contract as aspirations):	
C	1. Joint goal setting for change management & risk management
C	2. Learning from changes and sharing this knowledge
C	3. Risk management system
C	4. Equitable risk allocation
C	5. Clearly defined change management procedure and roles/responsibilities therein
C	6. Appropriate documentation of the change process
C	7. Early warning
C	8. Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.
Influence trust on change management process	
▪ 75-% of the efficiency of the change management process is determined by the trust level between the Employer and the Contractor. If there is a lot of trust, there will be less need to verify and you would accept what you are being told. As an aside, you will put more effort into what is important (i.e. the big figures) and less emphasis on the small stuff. Therefore, there will be less disputes because you are able to carry it through. ▪ 75+-% of the effectiveness of the change management process is determined by the trust level between the Employer and the Contractor. If there is a lot of trust, people are more likely to come forward with things that are correct and verifiable. Subsequently, things will get done since there is believe and trust in it. If there is no or little trust, then there will be more and more CEs and so on which will just be rubbish or scold out to come back another day. You will end up with all these CEs being dealt with at the end of the contract. In NEC terms, it is not meant to happen. You want the process to be able to give you the information to help plan and make changes and manage the project. If you have no effective change management process, you will end up losing control and with two costs to complete the project (i.e. the Employer's and the Contractor's cost, which are very different figures). ○ An example of the latter, the Edinburgh flood scheme where a 17-million-pound project became a 30-million-pound project. They were running the change management systems ineffectively and they did the same for the Edinburgh trams. The client was reporting that the claims were not justified. The contractor maintained the claims and the adjudicator's decision was more in favour of the contractor, but the client was still reporting that the claims were not justified. So the actual figure was much higher than the figure reported to the council. Oddly, the council's answer for other projects was to tighten up the process and to tighten up the contracts, nowhere did they say that the behaviours needed to be changed. ▪ Efficiency and effectiveness are not entirely separable because the effectiveness also depends on the efficiency.	

6. Additional remarks regarding the flood programme	
▪ In the 1998 Latham report, Latham says that every time when something goes wrong in a major way, the answer is to close all loopholes in the contract, to tighten up the contract and to pass on more risks to the contractor. Latham advises to actually start looking at the behaviours in the construction industry and why this industry is so adversarial and inefficient. ▪ Regarding the adversarial industry, I was involved in a project in Rothes where we used the ICE contract. There were a lot of contractual disputes because when you put someone (i.e. the contractor) in a cage, he will behave like an animal. We were trying to create a master-servant relationship instead of a team. At the end of the project, the Contractor's manager who I argued with every day, said to me that the project would make money for the Contractor in the end, but by that time he would be sacked because the parties would not resolve the disputes for about 3 or 4 years. Eventually, the Council would pay 3 million out of the 9 million which was claimed and then the Contractor would make his profit. ▪ When I came across this flood programme, I did <u>not</u> want to go down that same road. In order to do it better, you have to have a system where the team is together, you know the costs, you know what is achievable and you can highlight the risks to the members all through the projects. We could not have done it in a traditional contracting way as we would have lost control. By putting something out to tender, you have lost control. The Project Team is in control on these projects and is trusted to be in control. It is working, because the projects are broadly on time or ahead and are all under budget. ▪ Essential in first instances in a project is client leadership, because everything else flows from it. I took on the Project Director's role in 1998. It was not easy to change the mind of TMC towards what was an extreme logical way to develop a project. TMC's approach was very traditional and very adversarial (i.e. fragmented delivery, changing consultants and contractors and losing all the knowledge). It took about 18 months to convince TMC that this was the right way to do it. Their big fear was that they were letting a contract for an uncertain amount of money, because we were not going for a predictable defined cost very early on in the project. Therefore, we had to say they were right, but that they will control that because they will only spend what they have by instructing work through the contract. TMC was not familiar with the concept of a framework. The auditability of the system was also a point of discussion. TMC wanted to know how they could proof that they got the cheapest. The idea of having a quality assessment was foreign to TMC. It was very difficult and it took a long time to persuade TMC, because before anything would be designed and build they would have to put a huge investment upfront into understanding the right procurement model, the right contracts and how to manage the risks. If you get that right at the outset, then you can stand a good chance. ▪ The NEC contract does <u>not</u> have a big influence on the project. It has a facilitating influence, but <u>not</u> a driving influence. The driving influence comes from the concept. We could have run the project on a different standard form of contract provided we adapted the behaviours. For example, the ICE contract has similar change control processes, but they were abused and were not followed. There were timescales and rules etc. Provided you are going to take people and work reasonably, you can make that contract work. I think the NEC point you into the right direction, but you have to be wanting to go there because there are also NEC projects which go wrong as well (e.g. the Edinburgh flood scheme) probably due to the wrong main option, procurement and relationships. So I do <u>not</u> think that the contract is that fundamental.	

INTERVIEW REPORT #2P

Interview:	Project Forres (River Findhorn & Pilmuir) Flood Alleviation Scheme
Date of interview (DD/MM/YYYY):	29-10-2014
Time:	09.00 – 11.00h
Location:	Site Compound (29 West Road, Forres)
Interview planned by:	Lonneke Cheung
Date of report (DD/MM/YYYY):	26-01-2015
Validated (DD/MM/YYYY):	09-01-2015 (deemed acceptance)

1. Attendees				
Initials	Name	Role/Function	Company	Email
LC	Lonneke Cheung	Graduate Intern	TU Delft/RHDHV	-
BH	Barbara Hellett	'The Project Manager'	RHDHV	-

2. Answers given to questions regarding 'trust':	
Trustworthiness during procurement	
- The tender stages were sufficient to determine the Contractors' trustworthiness (i.e. ability, benevolence, integrity, predictability and reliability) to carry out the project. The chosen procurement procedure is commonplace now, but in 2003 it was quite innovative and new in the UK. The Employer had a proactive approach during the tender process and engaged in dialogues with the contractors in both tender stages, but particularly in the second stage. One of the things the Employer did was to visit a live construction site with each of the contractors. The purpose was to show the contractors around, to discuss with them how the site was working and to find out some specific things about the contractors. Without the dialogues (i.e. the contractors submit their paperwork and the Employer scores these), it is much more difficult to find out such things, because then you are one step removed from the actual people. - Besides competences, culture was a very important criteria during the tender process. The Contractor's culture had to match with the team that was already in place which consisted of The Moray Council (the Employer) and Royal HaskoningDHV (the Designer). Benevolence was one of the sub criteria of culture. - The Employer also did research on a personal level by looking into the attitudes of the Contractors' representatives. One of the key things the Employer wanted to know was whether the people they were talking to were likely to be involved in their projects. The Employer was looking for local representation and a Contractor with long-term employees (more certainty of continuity of people on the projects). This is perhaps unusual, because the flood programme would run for fifteen years. Up to now, the core teams of the Employer, the Designer and the Contractor have remained the same. So the Project Team knows what the aims were at the start of the flood programme and is still working to deliver the same goals.	
Reasonable behaviour	
- Clauses 10.1 and X12.3 in the NEC2 ECC (spirit of mutual trust and co-operation) have an <u>indirect</u> influence on the behaviours of the Employer, the Project Manager and the Contractor. Those ideals are what make a contract a success, but writing it down in words in the contract <u>cannot</u> create a spirit of mutual trust and co-operation. What creates such culture are, for example, a good working relationships from the start, a clear understanding of what the objectives are and an agreement that all parties can work together to achieve the common objectives. The contract does support this. - It is clear what is meant with clauses 10.1 and X12.3 in the NEC2 ECC. 'A spirit of mutual trust and co-operation' comes from relationships and building trust over time, rather than having words in a document. I do <u>not</u> think you can ever enforce it, but you can use it to your advantage during difficult discussions with the other parties. - The principle of good faith in Scots law has an <u>indirect</u> influence on the behaviours of the Employer, the Project Manager and the Contractor. Some of the interviewees probably do not know why they do certain things, especially if they have spent all their time in one country. Scots law is embedded in the culture of Scotland and therefore people deal with this principle, probably unknowingly, when growing up in Scotland. - The joint project objectives with regard to the relationship in the Project Charter have an <u>indirect</u> influence on the behaviours of the Employer, the Project Manager and the Contractor. The Project Charter was printed off and hangs on the wall in the corridor at the office, but most interviewees will probably claim never to have seen it because only three people (the project directors) signed this Charter. The Charter contains the things they believe in, therefore it will influence the things they do and say. These three people are quite influential in their organizations. The people on site are going to react more to those individual's ways of working rather than to the Project Charter. - Reasonable behaviour is <u>not</u> something you can write down in a manual. Early on the project, there was a disagreement between members of the Supervision team and the Contractor's team and they were swearing and calling each other names in the office. This could have been quite destructive early on the contract. I, as a Project Manager, had to do quite a lot of work to resolve the disagreement, for example, by talking to them and making them understand what needs to be done and what the consequences are.	
Project objectives	
- So far, the Employer, the Project Manager and the Contractor have lived up with the project objectives stated in the Project Management Plan and the Project Charter. The flood programme objectives have been reviewed (at least twice) over a fifteen-year period. It is <u>not</u> possible to set flood programme objectives which remain relevant all the way through for fifteen years. The flood programme objectives were adapted for each project to what was relevant at that time. It was easy to set the Forres project objectives, since it is the fifth project and all the hard work was already done in the previous projects. - Option M (limitation of Contractor's liability for his design to reasonable skill and care) was chosen because 'fitness for purpose' is the standard of care that the Designer offered to the Employer, so it was felt unreasonable that the Contractor should have a higher standard of care than the Designer. Although this option makes it fairer, the Contractor is in general quite reluctant to take on design responsibility for anything, because they probably had poor experiences on other contracts which made them very wary of doing that.	
Communication	

▪ So far, the Employer, the Project Manager and the Contractor have complied with the communication and information plans stated in the Project Management Plan. There are less problems due to the existence of such plans, but it is important that the team leaders keep reminding people to stick to the standard forms and the processes set out in the plans. ▪ So far, the Employer, the Project Manager and the Contractor have complied with Clause 13 in the NEC2 ECC regarding the communication in writing, but not regarding the two-week period of reply. A reply in two weeks is not always possible. It is more important to recognize the important communications rather than the importance of the period of reply. This can cause tension between the parties if one party is more focused on the period of reply. ▪ Communication according to the NEC2 ECC and the Project Management Plan is a lot of administrative work, but it is important and it works quite well. One person on the project deals with the administration and manages and tracks the exchange of documents between the parties. I focus on replying to the documents. ▪ The Employer, the Project Manager and the Contractor have informal contact with each other by means of the co-location and the agreement to have informal discussions prior to sending the formal documents.
Problem-solving ▪ So far, the Employer, the Project Manager and the Contractor have complied with Clauses 60-65 in the NEC2 ECC (Compensation Events). The dispute resolution clauses (90-93 and Y(UK)2 have <u>not</u> been applied yet, since there have been no disputes which could not be solved by means of discussions amongst the parties. ▪ The Project Manager is <u>not</u> impartial since the Project Manager represents the Employer, but the Project Manager is also part of a team with the goal of delivering this project within time and budget. I have been quite lucky in as far as there has been enough scope within the budget and the programme. As a result, I have not had to say 'no' to things which needed to be done to achieve the project objectives. It is unusual to have that flexibility. ▪ The Compensation Events (CEs) do <u>not</u> have an influence on the trust level between the Employer and the Contractor on this project, because of the pain/gain share mechanism. This mechanism has more influence on how CEs are viewed and the trust level. The parties are now in a 'gain' situation, which is quite unusual. If this changes to a 'pain' situation, the CEs may be viewed differently and may lead to distrust. ▪ In order to solve problems by means of amicable agreement the parties do the following: talking, early warning (only for severe problems), early warning meetings, collaboration and mutual help (depends on the people involved). ▪ So far, all problems were resolved by means of amicable agreement within the Project Team. I only warned and updated the Council a couple times that some things would be different (e.g. the size of the transformer in the pumping station).
Risk allocation ▪ The risk allocation between the Employer and the Contractor in the contract is clear. The risk register works well. The Employer, the Project Manager and the Contractor have monthly risk review meetings to review the risk allocation, to discuss all risks and to reduce the number of risks as time goes on. However, the NEC2 ECC contract is <u>not</u> clear on how to deal with disputes regarding risk management. On this project the parties discuss both the Employer's and the Contractor's risks in those meetings, which may be different from how the contract was intended to work. This method works well in terms of this Project Team, because of the fact that the parties are working together and the fact that the project is within budget. If the parties are in a 'pain' situation, it would have been a different scenario. ▪ Risk is allocated to the party best able to manage it. ▪ Option C (the Employer and the Contractor share the financial risk) was chosen instead of the other main options because according to the Employer this option is more likely to create the trust and co-operation, and the culture of working together they were looking for. ▪ In theory, the pain/gain share mechanism does create an incentive for the Contractor to issue a lot of CEs to increase the target cost and his profit, but on this project the Contractor does not exploit this flaw in the contract. It helps that the target price was negotiated, which is quite unusual, and that it was quite generous. The target price has been independently audited to check if it is value for money though. The 'gain' situation is mainly caused by means of some unexpected gains during the project (e.g. the higher quality of released materials for re-use and the mild weather). When parties are in a 'gain' situation they have more freedom to be a bit more forgiving, which allows trust to be developed. ▪ Besides the financial risk, the Employer and the Contractor do <u>not</u> share any other risks in terms of liability. This is where the theory of the pain/gain share mechanism falls down, because if the risks are not shared, the Employer's risks become CEs if they materialize. CEs increase the target cost. So the contract does not really encourage the Contractor to manage the Employer's risks. It is a risk with this contract strategy. It relies on strong management from the Employer and the Contractor, and the parties living up to the set ideals, but this is not easy. ▪ The Contractor's risks in the risk register are included in the target price. If the risks do not materialize, the actual costs become lower, which means that the Contractor's gain share increases. This is what actually happened on the project. For example, the risks of poor quality of released materials for re-use and bad weather conditions resulting in high river levels did not materialize. New construction risks are carried by the Contractor.
Continuous improvement of the relationship ▪ There were <u>no</u> formal meetings or workshops for the purpose of improving the relationship between the Employer and the Contractor. There were only two informal events in the form of a joint start up lunch and a joint Halloween lunch. More of such meetings or events would be better. There are also things which are initiated by individuals, such as also bringing in birthday cake for the people from the other organizations and arranging biscuits or ice cream for the meetings. ▪ The Employer and the Contractor did agree on co-location for the purpose of improving their relationship during the project. Co-location helps as there are joint facilities (e.g. the canteen) where people do chat over coffee and lunch. ▪ The evidence of emotional investments in the project is that there are people who have been involved all the way through, which implies that they actually care about the projects.
Other systems or processes ▪ Other systems or processes than the ones that were already given (see last page) which are relevant for building and sustaining trust between the Employer and the Contractor on this project are: past co-operation in the previous flood schemes. ○ This helps in terms of understanding the systems of the other parties, but on each project it still comes down to the individuals involved. Although there are people who turn up time and time again, the composition of the team on each project is somewhat better or worse than on other projects. ▪ Remarks:

- All systems or processes are important and exist in the project.
- 'Emotional investments' and 'reasonable behaviour' are the intangible ones (i.e. difficult to track down).
- The ranking is based on classifications. Group A (1) and group B (2-4) contain fundamentals which have to be in place before you do anything else, group C (5-9) contains high level communication aspects which become important once the fundamentals are in place and group D (10-12) contains low level communication aspects.

3. Answers given to questions regarding 'changes':

Project objectives

- So far, the Employer, the Project Manager and the Contractor have complied with the change management objectives stated in the PMP, but it is needed to keep reminding ourselves of these. The objectives were derived from the lessons learned from the previous flood schemes. There was Early Contractor Involvement during the design phase. One person from the Contractor's team joined the designers to make decisions about how things are going to be build. A problem on the previous projects was that the Contractor's team involved in the construction phase had different ideas about certain construction methods. Therefore the objective 'Design changes after target cost setting kept to a minimum other than to accommodate exceptional or unforeseen events or cost saving opportunities' was stated in order to distinguish 'necessary' design changes due to things that are different on site from 'preferred' ones. The Employer is the only one who pays for the additional design work and the delay on site due to 'preferred' design changes. Such changes do not necessarily lead to cost savings.
- The Employer and the Contractor did align objectives with regard to risk management. The risk management procedures were aligned. In the early stages, the parties agreed on the risk register, the regular risk review meetings and the joint reviewing of the risks. The Contractor probably has other things going on in order to manage his own risks. The risk management results also aligned in as far as both parties' approach is proactive. In addition, the risk management procedures promote a proactive approach.

Risk management

- So far, the Employer, the Project Manager and the Contractor have complied with the risk management plans stated in the PMP and in Clause 16 in the NEC2. The PM took the decision to separate out the risk management and early warning processes. These processes are more according to the NEC3, rather than the NEC2. The risk review meetings are general, administrative and regular meetings to update things, whereas the early warning meetings are only held if things are needed to change.
- The clause in the NEC2 was not clear, therefore I included risk management plans in the PMP to improve the contract management.
- The risk management approach by the Employer, the Project Manager and the Contractor during the project is largely proactive. I do not think you can be entirely proactive, because you cannot always predict what is going to happen. The approach comes down to the personalities of the people leading the two teams. Both the Project Manager and the Contractor's Construction Manager have a proactive approach and would rather know about a problem before it hits and try to mitigate it.
- Risk management plays a role in the change management procedure. Risks need to be reviewed constantly regarding the immediate future and the long-term future. That automatically links in to necessary changes and the management of changes.
- The link between the risk management and the Compensation Event clauses is clear in the NEC2. This clarity may be influence by practical experience with the NEC2. Without such experience it may be difficult to see how all things are linked together. The drafters of the NEC deliberately chose not to make cross-references between clauses and to keep the processes separate. All processes are only linked together implicitly, so the contract does make people to think about why they are doing things. This is a good thing since it generally helps to keep people on track.

Change management procedure

- The rules for change management in the PMP were derived from the lessons learned from the previous flood schemes and were added to the Compensation Event procedure in order to avoid 'preferred' design changes. The rules put in a second check by making the people who propose the change think about whether it generates benefits or not and whether it is necessary or preferable.
- The project registers are kept for administrative purposes, without these you will lose track of the information exchange because the standard forms need to bounce back and forth. The Contractor's registers are used because these were already existing since these are part of the Contractor's quality assurance system. In addition, for the Contractor's team it is easier because they do not have to deal with another project register which is produced by another party.
- So far, the Employer, the Project Manager and the Contractor have complied with the change management procedure. The system works well. There have been a couple of things where the Contractor wanted to do something different, but while drawing up the proposal it turned out that these changes were not beneficial, so the Contractor cancelled them.
- I do not know if all sub clauses in 60-65 in the NEC2 ECC are applied in the change management procedure. The parties have come up with a system on the basis of these clauses. This system works well in terms of keeping track of where we are at with the CEs and the costs. I believe we are acting in accordance with the NEC2, but I have not checked how closely our system matches with the NEC2.
- The Early Warning obligation stated in clause 16.1 in the NEC2 ECC does not play a role in the change management procedure, because I took the decision in the early stages that we were not going to follow this clause, but this is not documented anywhere. I did not want to be swamped with EWs telling me things I already knew. If I issue an instruction, I already know it is going to have a cost impact, otherwise I would not have issued it. So I do not want an immediate reply from the Contractor in the form of an EW saying it will affect the costs. Following this clause would lead to hundreds of EWs and it will affect the Project Manager's focus on the important things.
 - The sanction in the contract which states that the Contractor loses his entitlement on a CE unless he raised an EW is not helpful because then the Contractor will issue an EW for every single little thing. There will be so many EWs that the Project Manager cannot distinguish the ones for severe problems from the ones which are purely for administration. So on this project, the parties agreed that an EW will only be issued if it meant that the parties need to get together and talk in order to continue how the parties wanted to.
- It is clear what is meant with clause 16.1 in the NEC2 ECC, but it is not helpful in managing a contract.
- The change management approach by the Employer, the Project Manager and the Contractor during the project is half reactive/half proactive, because there are some reactive elements to it.

The following processes are included in the change management system and are performed by the Employer, the Project Manager or the Contractor:	
9. Before the change takes place, assess potential impact and create a proposed change order	X
10. Document the proposed change in a log	X
11. Determine priority of the change	-
12. Selection of optimum change options by consulting all relevant parties	X
13. Identify the likely impacts of different change options	X
14. (Prompt) decision making as to whether to accept/reject the change by someone with authority	1/2
15. Communicate final change decision to all team members whose work is affected by it	X
16. Appropriate documentation to record all decisions within the change process	X
5. Monitor and record implementation of the change	X
Remarks: On 10, not in a log, but it is documented in a form and the project register. On 14, sometimes the decision was made by someone without authority and the paperwork was done afterwards. The speed of decision-making depends on the priority of the change.	
Learning from changes	
- The Employer and the Contractor do <u>not</u> create 'lessons learned' specifically from change events during the project. The parties did create overall lessons learned from the previous flood schemes during the lessons learned workshops. The last lessons learned workshop was dedicated to creating lessons learned from the entire Moray Flood Alleviation Programme so that this knowledge can be transferred to other projects for each organization. - The lessons learned are created together and thus shared with each other. - The Employer and the Contractor do <u>not explicitly</u> measure the performance (efficiency and effectiveness) of the risk management processes during the project and adjust these if needed. It is measured implicitly in as far as the success of the processes is demonstrated with the success of the projects (i.e. delivered under budget). In addition, the risk management procedure has been developed over the previous flood schemes and works well, so it is <u>not</u> needed to improve this procedure.	
Other systems or processes	
- There are <u>no</u> other systems or processes than the ones that were already given (see last page) which are relevant for creating an efficient and effective change management process on this project. - Remarks: all systems or processes exist in the project.	

4. Answers given to extra questions regarding 'trust' and 'changes' (irrespective of the project)

Ranking of the most effective systems or processes for building and sustaining trust between the Employer and the Contractor (C = include in the contract):

C	1. Equitable risk allocation
C	2. Trustworthiness of organization: Track record, reputation, competences (financial, technical)
C	3. Trustworthiness of person: Track record, reputation, competences (financial, technical)
	4. Trustworthiness: Culture, policy
	5. Emotional investments
	6. Joint goal setting
C	7. Clearly defined communication system
	8. Reasonable behaviour
	9. Joint problem-solving
	10. Repeated fulfilment of communications and interactions
	11. Problem-solving at the lower levels
	12. System for continuous improvement of the relationship

Ranking of the most important systems or processes for an effective and efficient change management process (C = include in the contract):

C	1. Equitable risk allocation
	2. Risk management system
C	3. Clearly defined change management procedure and roles/responsibilities therein
C	4. Early warning
	5. Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.
	6. Joint goal setting for change management & risk management
	7. Appropriate documentation of the change process
	8. Learning from changes and sharing this knowledge

Influence trust on change management process

<u>75%</u> of the efficiency of the change management process is determined by the trust level between the Employer and the Contractor. It is all very well to set up a procedure, but if there is no or little trust, the Employer is more likely to have to investigate each individual bit of the Contractor's proposal more because the Employer does not believe what the Contractor is saying. The Employer's starting point is that he is expecting to find problems, so he will spend more time to find the problems or the faults in the proposal. <u>50%</u> of the effectiveness of the change management process is determined by the trust level between the Employer and the Contractor. On the one hand, if there is no or little trust, normally the parties can still achieve a close out in the end, but it will not be a pleasant experience and quick process. On the other hand, if there is no or little trust, the Employer does not believe it is a change, so the parties are more likely to end up in a dispute, which may be referred to the Arbitrator or the Court. - The effectiveness of the change management process is also influenced by its efficiency, as 'a minimum use of resources' to implement a change may also be an objective of the change management process.	

INTERVIEW REPORT #3P

Interview:	Project Forres (River Findhorn & Pilmuir) Flood Alleviation Scheme
Date of interview (DD/MM/YYYY):	30-10-2014
Time:	11.30 – 13.30h
Location:	Site Compound (29 West Road, Forres)
Interview planned by:	Lonneke Cheung
Date of report (DD/MM/YYYY):	26-01-2015
Validated (DD/MM/YYYY):	09-01-2015 (deemed acceptance)

1. Attendees				
Initials	Name	Role/Function	Company	Email
LC	Lonneke Cheung	Graduate Intern	TU Delft/RHDHV	-
BH	Briony Hall	'the Supervisor'	RHDHV	-

2. Answers given to questions regarding 'trust':	
Trustworthiness during procurement	
I was <u>not</u> involved in the procurement phase.	
Reasonable behaviour	
- Clauses 10.1 and X12.3 in the NEC2 ECC (spirit of mutual trust and co-operation) do <u>not</u> have an influence on the behaviours of the Employer, the Project Manager and the Contractor. These clauses form a basis for trust, but trust is very dependent on the people involved who are running the contract. I have worked on three different schemes. Each scheme had the same NEC contract and the same Contractor, but the Contractor's teams and the Project Managers were different. The differences between the three teams are noticeable and big regarding trust and co-operation. If you have the right people delivering the project and the right people involved, then you will more likely create 'a spirit of mutual trust and co-operation' and get what you want as the end product. - It is clear what is meant with clauses 10.1 and X12.3 in the NEC2 ECC, but it depends on the people how these clauses are interpreted. Everybody buys into these clauses, but doing things according to these clauses is more difficult. All three contracts are supposed to be open book, which means that the cost data is not confidential and can be checked by everyone. However, the transparency of the cost data depends on the people involved and how open they are with the procedures. This project is probably the best out of the three regarding trust and co-operation. It is much easier to work with the Contractor on this project. - I do <u>not</u> know if the principle of good faith in Scots law has an influence on the behaviours of the Employer, the Project Manager and the Contractor. I was <u>not</u> aware that this was part of the contract. - The joint project objectives with regard to the relationship in the project charter do <u>not</u> have an influence on the behaviours of the Employer, the Project Manager and the Contractor. The original project charter has been reviewed for this project and hangs on the wall at the office. On this project, there is still that rift between the Employer's Designers and the Contractor and sometimes we can get a bit heated with our roles. By large, all parties try to get along and try to work as a team, because the parties have to work together and trust each other to do what they should. However, writing down how people should behave on the project would <u>not</u> make any difference in it. For example, I do not like to fall out on people, I want to work nicely together and I treat people like I want to be treated. I do not need a piece of paper to tell me that. If you do need a piece of paper, then something is a little bit wrong on the project.	
Project objectives	
- So far, the Employer, the Project Manager and the Contractor have complied very well with the project objectives stated in the Project Management Plan and the Charter. - There have been no major accidents or incidents. - The parties have kept the community on board, are delivering the scheme as soon as they can and it has already saved properties from flooding. - The parties do use the team resources very well. - The parties have demonstrated sustainable solutions, for example, with the re-use of materials. - The parties have complied with the objectives regarding the environment (e.g. apply legislation to design work) and the sustainability (e.g. deal with the CAR objectives and keep the costs down). - The Contractor emphasizes the safety procedures and the Employer's team is quite on board with working with those. - It is all about team work and partnership. So far, it has been an enjoyable experience. - For example, on the Elgin project, we are working quite closely with the Employer to save a lot of money in relation to contaminated land remediation and ways to deal with that, and to deal with all the stakeholders to provide more immunity for the community, which falls within the planning requirements. - I do <u>not</u> know why Option M (limitation of Contractor's liability for his design to reasonable skill and care) was chosen. I was <u>not</u> involved in the preparation of the contract.	
Communication	
- So far, the Employer, the Project Manager and the Contractor have complied with the communication and information plans stated in the Project Management Plan. By large, the standard forms are quite good and it does give you that audit trail that you need. I strongly believe that double instructions are as good as the paper they are written on. The most efficient way to do that is to keep the paperwork up to date and on top of it and to make sure everything is written down. - Since the Rothes schemes, the standard forms have been developed further and any problems (e.g. the Supervisor's Notification regarding defects, things could not be closed out) have been solved to make them more efficient. The boxes to tick by the Employer's team on the Contractor's Submission form may still lead to confusion for the Contractor as to whether it is accepted or not. In addition, new standards forms were added to solve some problems. For example, the RFI form was added to solve the problem that the Contractor does not reply on the comments or questions when things are accepted with conditions, because he thinks the matter is already closed out or he has overlooked these.	

▪ So far, the Employer, the Project Manager and the Contractor have complied with Clause 13 in the NEC2 ECC (communication), <u>except</u> for the period of reply and the communication method. ○ Sometimes the two-week period of reply does <u>not</u> work. This has two reasons. First, the Contractor may ask you stuff, but does not give you two weeks to answer. The Contractor sometimes even gives you only two days. If this happens, sometimes I think that maybe the Contractor should have known about it sooner and does not really act according to the spirit of mutual trust and co-operation in our contact. Second, the Employer's team can be a bit slow in replying. ○ The communication method is <u>not</u> always in writing. Sometimes the parties do agree on things within two weeks, but verbally. I do not really like that, because things always have to be confirmed in writing. The Contractor probably agrees with that. For example, when you make snap decisions to change the design on site verbally, you do not know what the ramifications will be. Therefore it is essential that you stand your ground and do not make any decisions on site, but consult with other people first. ▪ Communication according to the NEC2 ECC and the Project Management Plan is a lot of administrative work, but it will pay off some day. ○ Over the course of time, I have learned that leaving an audit trail is important, because the client might need to look back at these documents in the future if something happens. In, for example, ten years time a lot of the people involved on the project will have left the company or will not remember the decisions made, therefore it is essential to be clear and concise about your instructions. ○ Some projects are better than others in record keeping, this project and the Elgin project are quite good regarding this aspect. So our method of communication is very key and particularly on this project we have learned a lot about telling that story in our paperwork and we think about what our client will need in ten years. The audit trail will show the client that we trust and respect him and that we did a good job, which may lead to future co-operations with the client. ▪ The Employer's and the Project Manager's team use Box (a digital Document Management System). This Box is <u>not</u> shared with the Contractor and the parties do <u>not</u> use another DMS. The Contractor keeps the hardcopies of everything and also stores digital records in Inview. Usually, the parties try to keep everything digital. ▪ The Employer, the Project Manager and the Contractor have informal contact with each other by means of the co-location and the telephone. The parties have chats with each other all the time, this is part of our team working. ○ For example, I have a lot of informal contact with Alistair, the Contractor's Site Agent, to talk about issues on site. If there is a problem, we talk through it, figure out the solution and follow it up with paperwork. ○ We also have informal chats to clarify points, drawings etc. ○ I suppose the co-location helps and makes it easier to have informal contact between the parties, but I am <u>not</u> sure because I mostly have worked on site in the same office as the Contractor anyway and the Contractor is friendly enough to pick up the phone to approach you anyway.	Problem-solving ▪ So far, the Employer, the Project Manager and the Contractor have complied with Clauses 60-65 in the NEC2 ECC (Compensation Events). The dispute resolution clauses (90-93 and Y(UK)2 have <u>not</u> been applied yet, since there have been no disputes. ▪ I do <u>not</u> deal with the finance part of the CEs. I think there have been no big problems with managing the CEs. Maybe the Contractor thinks that the CEs are not signed off quick enough. ▪ I do <u>not</u> know if the impartiality of the Project Manager causes any problems on the project, since I do not deal with the finance part of CEs. EC Harris deals with all the financial stuff and they check the CEs. So far, they only had comments about what is happening on site and the actual amount of work of the CEs performed by the Contractor. ▪ The Compensation Events (CEs) do <u>not</u> have an influence on the trust level between the Employer and the Contractor. We have had Early Contractor Involvement on these projects and we have worked with the same Contractor all the way through. There are always unknown unknowns on site (i.e. any unforeseen events which are not anticipated e.g. in the risk register, which change the target cost). I think that the Contractor does <u>not</u> withhold any information regarding such aspects in order to make a big claim, because it is not really beneficial due to the target cost and the pain/gain share mechanism, and the Contractor does not really want to jeopardize the Employer's trust over this. I am <u>not</u> involved in the finance part of CEs, but I have <u>not</u> heard of any unexpected claims so far. ▪ In order to solve problems by means of amicable agreement the parties do the following: set a common goal (although the approach may differ sometimes, the parties do have a common goal, the Contractor wants to build the scheme, whereas the Employer and the Designer want it to be built) and talk to each other, collaboration and mutual help to find the best way (i.e. has to be fit for purpose and cost effective) forward in order to get to the common goal and to the final end of the project. ○ For example, the solution of the grout curtain cut-off wall was changed to a sheet pile cut-off wall, because it was quicker, cheaper and less risky. This change resulted from meetings and communication between the parties and working together to deliver something that is fit for purpose and beneficial for all parties. The change saved the Employer a lot of money and time in relation to the project. ○ The parties do <u>not</u> just collaborate and help each other to solve mutual problems, but also to solve each other's problems because the parties have a common goal. For example, on the Rothes project regarding the bridge, the situation changed from 'washing our hands of it' to 'working as a team to deliver it'. The Contractor's proposal for the bridge was according to the Specification, but there were some errors in the Specification and the Designer had warned the Contractor that his proposal would not work. The Contractor went to the Employer behind the Designer's back anyway to propose a bridge that can be constructed cheaper and faster. The Employer accepted this proposal. During construction, it appeared that the bridge was not designed well and showed a 0.5m difference between the road and the bridge deck. After a few months, the Designer (RHDHV) decided to fix the Contractor's problem and do the design work. In the end, the outcome was what all parties wanted, the bridge re-opened and operational. Although the process was unpleasant, both parties came back from it. I still work with the same people from the Contractor's team and we are getting along just fine. ▪ Problem-solving also depends on the people. On the one hand, if you have the right people working together to deal with stuff, there will be no problem to solve things amicably. On the other hand, if you have obstructive people with a wrong agenda, the problems will be much more difficult to resolve. For example, on one project I had to work with someone from the Contractor's

team who was very obstructive. Even his colleagues were a bit taken aback from some of the stuff he did. He did not want to deliver me the test results no matter what I said or did. So I concluded that the test results did not exist. So far, most problems were resolved by means of amicable agreement at the lowest levels. The escalation model is as follows: site team > management team > strategic steering group. So far, some things were escalated, but I do <u>not</u> know if these were related to the contract.
Risk allocation - The risk allocation between the Employer and the Contractor in the contract is clearly defined. It has been a long time since I have seen the risk register, but I have been involved in some of the risk review meetings. The parties review the register quite frequently to remove risks. The risks are part of the pain/gain share mechanism and mitigated risks result in a gain share. - Risks are <u>probably</u> allocated to the party best able to manage them. Usually, the parties try to move the risks which they do not want to deal with as much as possible to the other party. - The risk review meetings are quite long as the parties fully discuss all risks. EC Harris is quite involved in managing the risks and acts as a third party to adjudicate through. I am <u>not</u> sure whether EC Harris is client-based or contractor-based, but they are employed by TMC (the Employer). - I do <u>not</u> know why Option C (the Employer and the Contractor share the financial risk) was chosen instead of the other main options. Maybe it was because when the Contractor came with the risk pot, it was astronomical, so the parties agreed to split the risk. - In theory, the pain/gain share mechanism does create an incentive for the Contractor to issue a lot of CEs to increase the target cost, but I do <u>not</u> think the Contractor will be able get away with it if he acts like that. On this project, there are <u>not</u> a lot of things for the Contractor to adjust the contract. The only new things were the accommodation works, but even for these a side budget was foreseen, so the costs were controlled. - I do <u>not</u> know if besides the financial risk, the Employer and the Contractor share any other risks in terms of liability. - I do <u>not</u> know if the Contractor receives a reward for carrying risk. There are Contractor's risks, but I am <u>not</u> sure how the pain/gain share mechanism works because I am <u>not</u> involved in the financial stuff.
Continuous improvement of the relationship - There were <u>no</u> formal meetings or workshops for the purpose of improving the relationship between the Employer and the Contractor. I am <u>not</u> sure when team building workshops are needed, when things go well or when things go badly wrong. For example, on the Rothes project we had to take each other out for a meal because we were not getting along very well. On this project, the parties get along quite well. There was only a 'get to know each other' lunch at the start of the project because there were quite a lot of new people in the team. Many people have worked on the previous flood schemes, but not all on the same. During the project, the relationship improves informally e.g. by chats over coffee. - The Employer and the Contractor did <u>not</u> agree on a system or measures for the purpose of improving their relationship during the project. The relationship improves informally.
Other systems or processes - Other systems or processes than the ones that were already given (see last page) which are relevant for building and sustaining trust between the Employer and the Contractor on this project are: continuity of people. It really helps if you already have working relationships and know how people work. However, continuity cannot be easily achieved. - Addition to 'system for continuous improvement of the relationship': lessons learned workshops, but the lessons learned need to be communicated well. One time we noticed that we had learned the same lesson again, which is not good. - Addition to 'joint goal setting': aim at winning an award. On one of the schemes, the parties were really aiming at winning an award. It was something that all parties were hoping for and wanted to achieve, so that really had influence on how we steered the project.

3. Answers given to questions regarding 'changes':

Project objectives

- The change management objective 'design changes after target cost setting kept to a minimum other than to accommodate exceptional or unforeseen events or cost saving opportunities' was set because on the Rothes project it was felt that a lot of things happened and that there have been a lot of design changes. These changes were not very well documented, so it was difficult to check why the changes happened or whether these were beneficial to the Employer. Therefore, since the Elgin project, we have been using a Change Management form, which allows for a business case to be put forward for making substantial design changes, because it is expensive to do design changes. The Change Management form has been used several times.
 - On the Elgin project, for example, originally we designed a sheet pile wall with an open channel straight through an area which was quite highly contaminated. We changed this to an extended culvert. This change was beneficial to the Contractor, to the landowners and to the Employer, because they did not have to deal with contaminated land, lose large pieces of land and compensate things respectively. Changes have to be beneficial to a 3 to 1 ratio in order to be implemented.
 - On the Forres project, for example, the change of the grout curtain to sheet piling saved a huge amount of money. It was about one million pounds.
- So far, the Employer, the Project Manager and the Contractor have partly complied with the change management objectives stated in the PMP. The parties did not comply with the objective 'design changes after target cost setting kept to a minimum other than to accommodate exceptional or unforeseen events or cost saving opportunities'.
 - It goes without saying that there will always be design changes. Changes are not always initiated by big events, there are also small changes on the project, for example, changes which are going to be beneficial to the Employer in the long-term. Such changes are covered by CEs.
 - So far, there have not been any unforeseen events on this project. According to the risk register, we would have many high flows when we were going to do the works, but this did not happen. As a result of the high flows, we would have really bad windows, but we have not.
- The Employer and the Contractor did align objectives with regard to risk management. The parties probably did align the risk management results and procedures.
 - Regarding the results, the Contractor wants to manage the risk properly, because if things get out of control, the target cost gets out control. As a result the Contractor might not get paid due to the pain/gain share mechanism. In

addition, the Contractor want to work with the TMC (the Employer) again at some point. So if the Contractor does not show that he is competent now, the likelihood of future work will reduce. Further, since the contract is open book, the parties cannot have different goals because then you would be working against yourself all the time. ○ Regarding the procedures, the parties have the risk register and the risk review meetings. I do not know whether the Contractor also keeps his own risk register.		
Risk management		
▪ So far, the Employer, the Project Manager and the Contractor have complied with the risk management plans stated in the PMP and in Clause 16 in the NEC2. The procedure works well. ▪ I do <u>not</u> know if the clause in the NEC2 is clear. ▪ The risk management approach by the Employer, the Project Manager and the Contractor during the project is <u>largely proactive</u>. All parties (including RHDHV and EC Harris) are involved in the risk review meetings. Everyone has his own points and is quite involved to defend these, because it can be quite expensive if things go wrong. ▪ Risk management plays a role in the change management procedure. Change may mitigate risks so that they can be removed from or reduced in the risk register. ○ On this project, for example, regarding the grout curtain, one major risk was the environmental impact as grout would be injected into the ground. Environmental pollution would result in prosecution and fines. This risk was taken away by changing the design. ○ On the Elgin project, for example, there was a high risk because the Contractor had to deal with the contaminated materials, which could end up into the river. This risk was lowered by a design change from a sheet pile wall with an open channel to a culvert. ○ The relationship between risks and changes does put a restriction on how you do your job, because if you want to make a change, you have to take into account its effect on the risk. We try to keep the design as fixed as possible, but we still need to have that ability to make beneficial changes.		
Change management procedure		
▪ Rules for change management in the PMP were added to the Compensation Event procedure. Considering these rules were added to the contract after the Rothies project, the CE procedure was <u>probably not</u> clear enough. The existing procedure did <u>not</u> give you that change control, that accountability and that audit trail you need for controlling the costs etc. So the parties learned from Mosset and Rothies that they needed tighter control, therefore new rules were applied for Elgin and Forres. ▪ The project registers allow you to keep track of the progress or status of the issues that the parties are dealing with at the moment. It is one of the most useful things we have on the project. You can easily see for yourself what you still need to answer or deal with. ▪ There have been <u>no</u> other improvements made to the change management procedure. ▪ So far, the Employer, the Project Manager and the Contractor have complied with the change management procedure. We only have had a small number of change management cases so far. ▪ I do <u>not</u> know if all sub clauses in 60-65 are applied for dealing with change. ▪ The clauses 60-65 in the NEC2 ECC are clear regarding the roles and responsibilities. I do <u>not</u> know if the clauses are clear regarding the processes and the types of changes. I just work with the standard forms and do <u>not</u> know whether our method matches the NEC2's. I have probably read the clauses, but that was five years ago. ▪ The Early Warning obligation stated in clause 16.1 in the NEC2 ECC plays a role in the change management procedure, but it depends on who uses the obligation because the EW can be abused. ○ On this project, the number of EWs is small as the parties only give an EW for serious things. The parties agreed to discuss matters first to decide whether it is an EW and whether it has an implication. ○ On the Elgin project, the number of EWs is large as the parties give an EW for everything just to generate paperwork (i.e. so many EWs that it is like somebody sneezes and there is an EW). Therefore, the EW on the Elgin project has lost its effect. The parties did not quite defined what an EW is. ▪ It is <u>not</u> clear what is meant with the 'aware' part in clause 16.1 in the NEC2 ECC as it is open to interpretation and can be abused. The Contractor may give you an EW and at the same time tell you that he cannot work next week or even tomorrow. On this project, it is not like that. The EW is <u>not</u> a useful tool because it is a tool for the Contractor to beat people with. ▪ The change management approach by the Employer, the Project Manager and the Contractor during the project is <u>largely proactive</u>. On this project, the parties deal with things as soon as they appear on the horizon and everything is moving forward through. On the Elgin project, the change management approach is entirely reactive. So again, it comes down to people. ▪ The following processes are included in the change management system and are performed by the Employer, the Project Manager or the Contractor:		
9.	Before the change takes place, assess potential impact and create a proposed change order	X
10.	Document the proposed change in a log	X
11.	Determine priority of the change	X
12.	Selection of optimum change options by consulting all relevant parties	X
13.	Identify the likely impacts of different change options	X
14.	(Prompt) decision making as to whether to accept/reject the change by someone with authority	X
15.	Communicate final change decision to all team members whose work is affected by it	X
16.	Appropriate documentation to record all decisions within the change process	X
5.	Monitor and record implementation of the change	X
Remarks: On 14, the speed of decision-making depends on the priority of the change.		
Learning from changes		
▪ The Employer and the Contractor do <u>not</u> create 'lessons learned' specifically from change events during the project, because it has no use. Our design solutions are based on the best information at the time. For example, the sheet piling wall was not possible according to the geotechnical information. The actual geotechnical conditions on site may differ and require a change to the design. Such changes could not have been prevented as more ground investigation would have told you the same things. So you are as good as the information that is given. ▪ Any findings and lessons learned are shared between the parties, because it is an open book contract.		

▪ The Employer measures the performance (efficiency and effectiveness) of the risk management processes during the project and adjust these if needed. I do <u>not</u> know if the Contractor does it as well.
Other systems or processes ▪ There are <u>no</u> other systems or processes than the ones that were already given (see last page) which are relevant for creating an efficient and effective change management process on this project.

4. Answers given to extra questions regarding 'trust' and 'changes' (irrespective of the project)

Ranking of the most effective systems or processes for building and sustaining trust between the Employer and the Contractor (C = include in the contract, IC = indirectly include in the contract):

C	1.	Reasonable behaviour
	2.	Emotional investments
	3.	Repeated fulfilment of communications and interactions
C	4.	Clearly defined communication system
IC	5.	Joint goal setting
IC	6.	Joint problem-solving
IC	7.	Problem-solving at the lower levels
	8.	Trustworthiness of person: Track record, reputation, competences (financial, technical)
	9.	Continuity of people
C	10.	System for continuous improvement of the relationship
	11.	Trustworthiness: Culture, policy
C	12.	Trustworthiness of organization: Track record, reputation, competences (financial, technical)
C	13.	Equitable risk allocation

Ranking of the most important systems or processes for an effective and efficient change management process (C = include in the contract, IC = indirectly include in the contract):

C	1.	Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.
C	2.	Clearly defined change management procedure and roles/responsibilities therein
C	3.	Appropriate documentation of the change process
C	4.	Risk management system
C	5.	Equitable risk allocation
	6.	Learning from changes and sharing this knowledge
	7.	Joint goal setting for change management & risk management
C	8.	Early warning

Influence trust on change management process

- 75% of the efficiency of the change management process is determined by the trust level between the Employer and the Contractor. If there is no or little trust, the Employer is more likely to believe that you are not doing things right, so he will use more resources (time, money etc.) to check things himself. In addition, the Employer is more likely not to give you the resources you need to achieve your goal (see further below).
- 75% of the effectiveness of the change management process is determined by the trust level between the Employer and the Contractor. If you have a goal and there is a lot of trust, the Employer is more likely to let you do it as he believes that your judgment is correct and that your goal is at his best interests. So the Employer will give you more resources (time, money etc.) to achieve that goal. If there is no or little trust, the Employer will probably not let you do it and he is more likely to do his best efforts to hold you back. So the Employer will give you little resources to achieve your goal, which means that you cannot do your job to the best of your ability and thus do not achieve your goal.

INTERVIEW REPORT #4I

Interview:	Project Forres (River Findhorn & Pilmuir) Flood Alleviation Scheme
Date of interview (DD/MM/YYYY):	30-10-2014
Time:	09.00 – 11.00h
Location:	Site Compound (29 West Road, Forres)
Interview planned by:	Lonneke Cheung
Date of report (DD/MM/YYYY):	26-01-2015
Validated (DD/MM/YYYY):	29-01-2015

1. Attendees				
Initials	Name	Role/Function	Company	Email
LC	Lonneke Cheung	Graduate Intern	TU Delft/RHDHV	-
NM	Neil Mackay	Cost Consultant	EC Harris	-

2. Answers given to questions regarding 'trust':	
Trustworthiness during procurement	
I was <u>not</u> involved in the procurement phase.	
Reasonable behaviour	
- Clauses 10.1 and X12.3 in the NEC2 ECC (spirit of mutual trust and co-operation) do <u>not</u> have an influence on the behaviours of the Employer, the Project Manager and the Contractor. This principle forms the whole basis of the NEC contracts, therefore everyone should behave in that manner. On this project, everyone adheres to this principle, but at the start of the project a high level of trust was already in place between the parties. This trust has been built up over time, for example, by means of the the past co-operations on the other flood schemes, the continuity of staff and the joint lessons learned workshops. So the principle in the contract is <u>not</u> effective on this project. - It is clearly stated on this project what is meant with clauses 10.1 and X12.3 in the NEC2 ECC and everyone knows what it means and how to behave thereafter. - The principle of good faith in Scots law has an influence on the behaviours of the Employer, the Project Manager and the Contractor. On this project, all parties are working according to the principle of good faith. The people on this project act according to the contract the best they can regarding the law side of things, but it is probably in a person's characteristic anyway to act in that manner. - The joint project objectives with regard to the relationship in the project charter have an influence on the behaviours of the Employer, the Project Manager and the Contractor. All parties are working according to those objectives. Most people on this project care about the people in their environment. The challenge is to take appropriate action if someone behaves poorly. The objectives were derived and updated from the previous flood schemes.	
Project objectives	
- So far, the Employer, the Project Manager and the Contractor have adhered to the project objectives stated in the Project Management Plan (PMP) and the Charter. The PMP was included as an appendix to the contract, so all parties are aware of the PMP and its content. The PMP of the Elgin project, which was drawn up by all parties, was used as a basis for the PMP of this project. Some aspects were amended. - I do <u>not</u> know why Option M (limitation of Contractor's liability for his design to reasonable skill and care) was chosen.	
Communication	
- So far, the Employer, the Project Manager and the Contractor have complied with the communication and information plans stated in the Project Management Plan. These plans work well. One thing we do <u>not</u> do as well as we should is to adhere to the timescales for certain communications from both parties, because a reply in two weeks is <u>not</u> always possible. The Project Manager had identified this problem at the beginning of the project and concluded that the parties should not focus on strict adherence to the time scales. The Employer and the Contractor are also aware that the time scales are not as rigid as they could be, but all parties try to stick to the period of reply and the standard forms as well as they can. - So far, the Employer, the Project Manager and the Contractor have complied with Clause 13 in the NEC2 ECC (communication) in terms of the communication in writing, but <u>not</u> in terms of the two-week reply period. The parties use standard forms for each type of communication and all communication is in writing and can be read and copied. - Communication according to the NEC2 ECC and the Project Management Plan is a lot of administrative work, while the Project Team is quite small. Everyone does the best they can to adhere to these plans. The parties try to prioritize documents in order to process the important and the critical ones first. - The formal documents are sent out electronically. The Employer's and the Project Manager's team use Box (digital Document Management System) to store all the records, but there are also hardcopies kept for the Contractor because this Box is <u>not</u> shared with the Contractor. - The Employer, the Project Manager and the Contractor have informal contact with each other by means of the co-location, talking about issues with the others who are involved prior to sending the formal documents, the telephone (e.g. between Barbara and Dave), and chats before and after meetings. Informal contact is something in which the parties are good at on this project. Everyone feels openly that they can talk to the other parties. The co-location makes it easier to approach each other. In addition, the co-location gives the feeling you are working as one team. There is less informal contact with the Employer since his office is located in Elgin.	
Problem-solving	
- So far, the Employer, the Project Manager and the Contractor have complied with Clauses 60-65 in the NEC2 ECC (Compensation Events). The dispute resolution clauses (90-93 and Y(UK)2 have <u>not</u> been applied yet, since there have been no disputes. - The CEs are still manageable, <u>except</u> for the period of reply. There have been a lot of PMI's sent out by the Project Manager for all the changes which took place on site and there have been quite some new risks. Therefore, the parties have raised a lot of CEs. It is <u>not</u> always possible to adhere to the period of reply when drawing up the quotations which should be included in the PMI's, partly due to the great number of CEs in a certain period.	

▪ The impartiality of the Project Manager is <u>not</u> a problem on the project. Although Barbara works for RHDHV (the Designer) and for The Moray Council (the Employer) as the Project Manager, she does <u>not</u> take any particular side and remains impartial on this project. ▪ The Compensation Events (CEs) do <u>not</u> have an influence on the trust level between the Employer and the Contractor. There is a high level of trust between the parties. The NEC2 ECC is set up as an open book contract and it is very much on partnership. If the Contractor submits a quotation for a CE, I can check the Contractor's cost data (e.g. physical time sheets, invoices and plant and material costs). So there is trust in what the Contractor is submitting. The Contractor produces daily and weekly record sheets to show what has been done on site and the time spent. Such sheets are checked and signed off by the Employer's Site Supervisor. So the CEs are checked on a couple of levels. ▪ In order to solve problems by means of amicable agreement the parties do the following: ○ Early warning meetings only for big issues. ○ Informal discussions between the parties for small issues. ○ Monthly progress meetings (platform to discuss issues on site, for example, anything holding up the works, things which are not done on site, landowner issues). ○ Collaboration and mutual help (all parties are involved and working together to find a way to go forward). ▪ So far, all problems were resolved by means of amicable agreement. The highest level reached in the escalation model is the monthly progress meeting.
Risk allocation ▪ The risk allocation between the Employer and the Contractor in the contract is clear. The risk review meetings are held every two months and are attended by the Employer, the Project Manager and the Contractor. In the risk review meetings the risks are jointly managed out and both parties are involved in that process. So the Employer's risks and the Contractor's risks are clear for all parties. As a result of the risk workshop in which both the Employer and the Contractor were involved, risks are allocated to the party best able to manage them. ▪ Option C (the Employer and the Contractor share the financial risk) was chosen instead of the other main options because this option creates an incentive for both parties to perform well on the project since the gains are shared between the parties. The application of this option was derived from the previous flood schemes. ▪ In theory, the pain/gain share mechanism does create an incentive for the Contractor to issue a lot of CEs to increase the target cost. On this project, the CEs are reviewed by the Employer to check whether they are justified and whether they increase the target cost. It also comes down to trust between the parties that the Contractor will <u>not</u> exploit this flaw in the contract. ▪ Besides the financial risk, the Employer and the Contractor share some risks in terms of liability (i.e. risks which are allocated to both parties). ▪ The Contractor's risks are included in the target cost. If the Contractor manages out these risks, he will be rewarded for it through the pain/gain share mechanism.
Continuous improvement of the relationship ▪ Since my involvement on the projects, there have been two lesson learned workshops in which the Employer and the Contractor discuss how things can be improved. Such workshops also include any improvements which can be made regarding the relationship between the Employer and the Contractor. ▪ The Employer and the Contractor did <u>not</u> agree on a system or measures for the purpose of improving their relationship during the project. The improvement of the relationship is an ongoing process.
Other systems or processes ▪ Other systems or processes than the ones that were already given (see last page) which are relevant for building and sustaining trust between the Employer and the Contractor on this project are: the past co-operation in the previous flood schemes. This has helped the parties to get to the level of trust at the moment.

3. Answers given to questions regarding 'changes':

Project objectives

- So far, the Employer, the Project Manager and the Contractor have partly complied with the change management objectives stated in the PMP. The parties did not comply with the objective 'design changes after target cost setting kept to a minimum other than to accommodate exceptional or unforeseen events or cost saving opportunities'. There have been a lot of other design changes as well after the target cost was set. The design changes are recorded as CEs. For example, the first CE was to capture all the design changes from the target set drawings to the construction drawings. The Contractor had to check which additions and omissions were made, which was a lot of work.
- The Employer and the Contractor did align objectives with regard to risk management. The procedures were aligned and set out in the PMP. I do not know if the objectives regarding the results of risk management were aligned.

Risk management

- So far, the Employer, the Project Manager and the Contractor have adhered to the risk management plans stated in the PMP and in Clause 16 in the NEC2. The risk review meetings are held every two months. All parties are involved in these meetings to go through all the individual risks (i.e. check what happened with these risks and whether these can be reduced), to check whether new risks have been identified, to look at the future risks, to check and adjust the probabilities and impacts of the risks etc. All updates of the risk register are recorded in detail (e.g. comments are added) and shared with all parties. So the status of the each individual risk is clear for all parties.
- The risk management approach by the Employer, the Project Manager and the Contractor during the project is largely proactive. All parties are involved in the risk review meetings and in the process to manage the risks. Everyone is aware of the risks and what has been done to mitigate these.
- Risk management plays a role in the change management procedure. Any risk which cannot be adequately mitigated and reduced will have an effect on the CEs which are coming through. If we can manage risk and reduce the probability of things happening on site, which will have an effect on the cost of any CE that will be submitted by the Contractor. Any changes which are likely to occur should be on the risk register. On this project, CEs are coming through all the time due to unforeseen events on site. The risk register captures any issues we might encounter when going forward.

I do <u>not</u> know if the link between risk management and the Compensation Event clauses is clear in the NEC2. On this project, the link between these two aspects is clear for the parties.	
Change management procedure	
- The two rules for change management in the PMP were <u>probably</u> added to the Compensation Event procedure to create more control over changes by the Project Manager. - The project register is a good management tool to capture and to keep track of all the communications on the project. - So far, the Employer, the Project Manager and the Contractor have adhered to the change management procedure, <u>except</u> for the period of reply. The procedure works well, but the whole system is very onerous and time consuming because the parties have to produce a lot of paperwork, - I do <u>not</u> know if all sub clauses in 60-65 are applied for dealing with change. Certain standard sub clauses are used more than others. On this project, we <u>probably</u> apply only the ones which are useable. - Improvements to the change management procedure have been made over the course of the previous flood schemes to get to the point at where we are today. So over a period of time the procedure has been improved and streamlined, but it still in line with the NEC2 ECC clauses. - The clauses 60-65 in the NEC2 ECC are clear regarding the processes and the roles and responsibilities. The types of changes which can be initiated are clearly defined in the PMI's which are sent out to the Contractor. - The Early Warning obligation stated in clause 16.1 in the NEC2 ECC plays a role in the change management procedure. The EW makes both parties aware of a change before the change is actually going to happen and to put mitigations in place to minimize the disruption of that change. So this way both parties can manage out the change before it happens on site. The discussions between the parties after an EW are usually informal. - It is clear what is meant with clause 16.1 in the NEC2 ECC. Both parties should be adhered to this EW obligation. On this project, the Contractor will issue a Technical Query (TQ) if he foresees any issues or changes. Subsequently, the Site Supervisor will have a look or will check the drawings and replies to the TQ and the time that has been notified. - The change management approach by the Employer, the Project Manager and the Contractor during the project is <u>largely proactive</u>, because of the nature of the contract and the PMP. The change management procedure is clearly set out in these two documents and all parties adhere to it. All parties have a proactive approach by their involvement in the EW meetings, the risk review meetings and the progress meetings. Everyone is aware of any issues which are materializing, so they can give these attention early on. - The following processes are included in the change management system and are performed by the Employer, the Project Manager or the Contractor:	
9. Before the change takes place, assess potential impact and create a proposed change order	X
10. Document the proposed change in a log	X
11. Determine priority of the change	X
12. Selection of optimum change options by consulting all relevant parties	1/2
13. Identify the likely impacts of different change options	X
14. (Prompt) decision making as to whether to accept/reject the change by someone with authority	X
15. Communicate final change decision to all team members whose work is affected by it	X
16. Appropriate documentation to record all decisions within the change process	X
5. Monitor and record implementation of the change	X
Remarks: On 10, it is documented in the project registers. On 11, priority can be determined by looking at the impact of the change. On 12, only for big changes. On 14, the speed of decision making depends on the work load and the priority of the change.	
Learning from changes	
- The Employer and the Contractor do <u>not</u> create 'lessons learned' specifically from change events during the project. The parties do learn from changes unknowingly. Changes events are discussed informally, especially the large change events. - Any submissions regarding large changes are discussed between the Employer and the Contractor before an agreement is reached on which way the parties want to go forward with them. So any lessons learned from these discussions are shared with each other. - The Employer and the Contractor do <u>not</u> measure the performance (efficiency and effectiveness) of the risk management processes during the project and adjust these if needed. Improvements to the risk management procedure have been made over the course of the previous flood schemes to get to the point at where we are today. Therefore the procedure works well on this project.	
Other systems or processes	
There are <u>no</u> other systems or processes than the ones that were already given (see last page) which are relevant for creating an efficient and effective change management process on this project.	

4. Answers given to extra questions regarding 'trust' and 'changes' (irrespective of the project)		
Ranking of the most effective systems or processes for building and sustaining trust between the Employer and the Contractor (C = include in the contract:		
C	1.	Trustworthiness of organization: Track record, reputation, competences (financial, technical)
C	2.	Trustworthiness: Culture, policy
C	3.	Trustworthiness of person: Track record, reputation, competences (financial, technical)
C	4.	Reasonable behaviour
C	5.	Clearly defined communication system
	6.	Repeated fulfilment of communications and interactions
	7.	System for continuous improvement of the relationship
	8.	Emotional investments
C	9.	Equitable risk allocation
	10.	Joint goal setting
	11.	Joint problem-solving
	12.	Problem-solving at the lower levels
Ranking of the most important systems or processes for an effective and efficient change management process (C = include in the contract:		
C	1.	Clearly defined change management procedure and roles/responsibilities therein
C	2.	Appropriate documentation of the change process
C	3.	Joint goal setting for change management & risk management
C	4.	Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.
C	5.	Early warning
C	6.	Risk management system
C	7.	Equitable risk allocation
	8.	Learning from changes and sharing this knowledge
Influence trust on change management process		
▪ <u>75%</u> of the efficiency of the change management process is determined by the trust level between the Employer and the Contractor. If there is no or little trust, the Employer must use more resources (time, money etc.) to check whether the information from the Contractor is accurate and complete. It helps if the contract is open book so that the Employer can check the Contractor's cost data (e.g. time sheets, invoices) and if in case of any queries from the Employer, the Contractor is very open about how he determined the costs of a CE. ▪ <u>75%</u> of the effectiveness of the change management process is determined by the trust level between the Employer and the Contractor. The Employer must trust the Contractor that he is working towards the same goal or outcome for changes. In other words, that the Contractor only issues CEs for changes which are justified. In addition, the parties have to trust each other that they will follow the correct procedures.		

INTERVIEW REPORT #5C

Interview:	Project Forres (River Findhorn & Pilmuir) Flood Alleviation Scheme
Date of interview (DD/MM/YYYY):	29-10-2014
Time:	11.30 – 13.30h
Location:	Site Compound (29 West Road, Forres)
Interview planned by:	Lonneke Cheung
Date of report (DD/MM/YYYY):	26-01-2015
Validated (DD/MM/YYYY):	09-01-2015 (deemed acceptance)

1. Attendees				
Initials	Name	Role/Function	Company	Email
LC	Lonneke Cheung	Graduate Intern	TU Delft/RHDHV	-
IM	Ian Mackay	Construction Manager	Morrison Construction	-

2. Answers given to questions regarding 'trust':	
Trustworthiness during procurement	
- The tender stages were sufficient to demonstrate the Contractors' trustworthiness (i.e. ability, benevolence, integrity, predictability and reliability) to carry out the project. The process we went through was quite thorough. We had to send in documents for the Employer to review. In addition, there were meetings and interviews through which the Employer should have been able to get a fairly good view of, for example, what sort of company we were, the kind of culture of our company and as to whether we were going to be open and honest. The Employer did not only look at the hard issues (e.g. competences), but also at the soft issues (e.g. culture). They was not too skeptical and tried to get everybody involved. The procedure worked well since it helped the Employer to decide which contractor would be the easiest for them to work with or fall in line with their way of doing things. - The Employer also did research on the personal level by looking into the trustworthiness of the Contractors' representatives. They tried to do this by requesting CV's for each of the key people who were going to be involved in the projects and I think they did speak to referees to see whether the people were who they said they were on the CV's. In addition, there were interviews in which the Employer could actually meet and judge the people. You can never know for 100% whether somebody is what you expect him to be until you start working with him, but this method is the best way for the Employer to get a good picture instead of just submitting a tender.	
Reasonable behaviour	
- Clauses 10.1 and X12.3 in the NEC2 ECC (spirit of mutual trust and co-operation) do <u>not</u> have an influence on the behaviours of the Employer, the Project Manager and the Contractor. The fact that this is written in the contract does <u>not</u> really influence people too much. Therefore it is important to focus before you employ everybody to check whether you have people who are willing to work that way. If they are not willing to work that way, having the words in the contract does <u>not</u> really enforce it. These words in the contract do have an added value as it implies that if anybody does not act like this, he/she can be asked to be taken off the project. 'A spirit of mutual trust and co-operation' <u>cannot</u> be created by words, but only by the people involved. - It is clear what is meant with clauses 10.1 and X12.3 in the NEC2 ECC. - The principle of good faith in Scots law <u>probably</u> does have some influence on the behaviours of the Employer, the Project Manager and the Contractor, but only if they are knowledgeable enough to know what that means (e.g. by having experienced something where that has been taken into account). Most people are not so knowledgeable of the law and the contract, but they are governed by the people around them and behave the same way as them. Anybody who is fairly experienced in the construction industry knows the real effect of the law, so it does influence how he/she behaves. - The joint project objectives with regard to the relationship in the project charter have an <u>indirect</u> influence on the behaviours of the Employer, the Project Manager and the Contractor. When you know that the Employer has aspirations to behave and work in a certain way, you will try to put people in place who want and are capable to work that way. Personality is an important aspect in the selection process. You do not want e.g. people who have struggle to behave in that way or people who are confrontational. So it does have an influence on how we set up and organize our management team.	
Project objectives	
- So far, the Employer, the Project Manager and the Contractor have complied with the project objectives stated in the Project Management Plan and the Charter. The general attitude is to achieve these project objectives by working together to solve problems and to investigate things, and things are going well as they should. A fairly good attitude towards how to deal with safety and environment has been developed. - Option M (limitation of Contractor's liability for his design to reasonable skill and care) was chosen because 'fitness for purpose' is usually quite an onerous thing to achieve. Therefore a lot of contractors are wary of that term. In addition, insurance companies are sometimes a bit adverse to these words in the contract. So we usually change this if we can. I do <u>not</u> know the history of this choice, but there were probably some jobs in the past in which it was an issue. It is a flood scheme, so if it does not work, it will have repercussions in terms of liability for insurance of houses which may flood. We are not the main designers, but we do have some design work (about 10-15% of the overall design). Our designer does <u>not</u> want to take on liability for the whole design but only for his element of the design, because he cannot influence the design entirely. Due to the overlap of the designs it is difficult to define who is liable for something and 'fitness for purpose' makes it even more complicated.	
Communication	
- So far, the Employer, the Project Manager and the Contractor have complied with the communication and information plans stated in the Project Management Plan. These plans works quite well. Communication is very important for things to go well on this project, therefore we try our best to make sure that procedures are being followed and that actions are closed out when they are supposed to be closed out. - The process of agreeing on the price of design changes usually take longer than would be ideal, but that is usually because everybody is very busy and focused on getting the work done, which leaves very little time left for the	

agreement of such issues. For this reason we decided to agree things in principle before drawing up the formal documents. ○ The NEC2 ECC is quite onerous in terms of procedures, forms and time scales for agreeing things. We try our best, but it is difficult to meet the time scales. You will need more people to do everything on time, which means extra costs, but none of the parties want that. ▪ So far, the Employer, the Project Manager and the Contractor have complied with Clause 13 in the NEC2 ECC (communication), <u>except</u> for the period of reply. We try to adhere to the two-week period of reply, but it is <u>not</u> always possible. For example, regarding the design the process of getting a reply from the Employer takes longer due to planning, consultations etc. ▪ Communication according to the NEC2 ECC and the Project Management Plan is a lot of administrative work due to rules such as the separate communications and the period of reply. ○ Regarding the former, formal communication is done separately for each notification by means of the standard forms. We do not use letters, but we send emails to ask for something. Subsequently, these are followed up by formal documents. The project register is used to record and track down the formal communications. This method does require a lot of administrative work, but once you get a habit of doing that, it works well. ○ Regarding the latter, about 80% of formal communication can be replied within two weeks, but there are always things (e.g. request for a design change or a technical query due to an error between the specifications and the bill of quantities) which require more time because the other party very often needs to consult somebody else in order to reply. We usually include the date on the document when we need the information, right before it starts affecting the works. So the period of reply may be different for every document and is adjusted to the amount of work that needs to be done in order to reply. This method works well, since the period of reply is more reasonable and the parties are able to prioritize what is important. ▪ The Employer, the Project Manager and the Contractor have fairly regular informal contact with each other by means of the co-location, the telephone and before and after the progress meetings.	Problem-solving ▪ So far, the Employer, the Project Manager and the Contractor have complied with Clauses 60-65 in the NEC2 ECC (Compensation Events). The dispute resolution clauses (90-93 and Y(UK)2 have <u>not</u> been applied yet, since there have been no disputes. There are quite a lot of CEs, partly because all of the planning conditions were not closed out in the contract and we found different ground conditions, and we had few value engineering ideas. None of the CEs was contentious, but all were easily discussed and agreed. ▪ There have been quite a lot of CEs, but they are still manageable. However, the CEs do stretch the desire a bit because the design changes require the other parties to get a lot of information out so that the Contractor can continue working. Therefore it is important to prioritize the changes. In addition, the Contractor tries to think ahead to avoid any problems. ▪ The impartiality of the Project Manager is <u>not</u> a problem on this project since the Project Manager has been very good and very reasonable. The Project Manager plays an important role on NEC projects, therefore it is essential that this person is good at his job and his impartiality is key. ▪ Compensation Events (CEs) <u>definitely</u> have an influence on the trust level between the Employer and the Contractor, but <u>not</u> on this project. The Contractor's team works for a commercial company and focuses on what is best for the company. If the Contractor loses sight of being fair and just focuses on making profit, it is very easy to lose the Employer's trust and the Contractor is more likely to end up in a dispute with the Employer. In order to maintain the trust between the parties, it is important that Employer is impartial and that the Contractor is reasonable and fair to what the Employer asks. It takes a while to get to the point where both parties act like this. Most people have to struggle with this, as they come from a different background in which it is a kind of natural thing to try to get something extra, and for the Employer it is quite natural to think that the Contractor is going to do that. On this project, both parties behave quite well. ▪ In order to solve problems by means of amicable agreement the parties do the following: ○ Communication (to make sure that both parties understand the details of the problem and each other's priorities). ○ Collaboration and mutual help (the best solutions are the ones in which all parties were involved e.g. to rule out certain proposed solutions and to take into account the total impact of the problem). ○ Early warnings (an EW meeting is often not necessary as the EWs are usually already discussed between the parties and followed up by CEs, there are more CEs than EW meetings, which is a sign that things are working well). ▪ So far, all problems were resolved by means of amicable agreement at the lowest levels. Dave Gowans, the Project Director, was only involved a few times in discussions about some CEs to be updated on the details and the possible solutions of the issue. Risk allocation ▪ The risk allocation between the Employer and the Contractor in the contract is clear. Normally, the Contractor does <u>not</u> have an influence on the risk allocation, but on this project, the Contractor was involved in the risk workshop. Both Employer's and Contractor's risks were clarified and discussed extensively, and suggestions and comments were made during the risk workshop. ▪ The parties attempted to allocate the risks to the party best able to manage them. The Contractor had doubts about several of his risks, because he was not sure if he was best able to manage those. Therefore the Contractor wanted to make an agreement on how to deal with those risks. There are always some risks which could be allocated to either party. The allocation of such risks require an agreement of both parties, but the final decision rested with the Employer. On this project, it was decided to include a threshold for such risks. One party carries the risk up to the threshold, after that the other party is liable for the risk. The risk workshop worked really well and resulted in a risk allocation with which both parties are comfortable. ▪ The risk allocation has worked quite well on the project. The risks are monitored throughout the project and allows the parties to focus on things which may cause problems and to look for mitigations. It helps that the Contractor was involved in the risk workshop, since it gave the Contractor a lot of opportunity and time to work on the risks. Due to the clarity of the risks and the risk allocation, the Employer was better able to budget the project and to monitor the overall project costs. ▪ Option C (the Employer and the Contractor share the financial risk) was <u>probably</u> chosen instead of the other main options because when the contract and the target price was agreed, there were still some elements not fully designed, some consultations not completed, and some of the planning conditions were not signed off. So some elements were not black and white, but it was necessary to start the project anyway because of the funding. Option C is quite flexible as the target cost allows for CEs to increase the target cost in order to accommodate such expected changes. Lump sum is not good if you expect changes.

Cost plus is not good for the Employer as the final cost is not known until the project is finished. Option C seemed to be the best option for both parties. ▪ In theory, the pain/gain share mechanism does create an incentive for the Contractor to issue a lot of CEs to increase the target cost, but if the Contractor does this, he will lose the Employer's trust very quickly. On this project, most of the CEs are negative, so there is more reduced work than additional work. The Contractor had quite a lot of value engineering ideas which have resulted in cost savings. ▪ Besides the financial risk, the Employer and the Contractor do <u>not</u> share any other risks in terms of liability. The risk allocation is very clear and it is very well defined who is liable for which design elements. ▪ The Contractor's risks are included as a risk allowance in the target price. Any cost savings (e.g. due to good risk management or if the risks do not materialize) and any cost overruns (e.g. due to underestimated prices) regarding the risk allowance are shared 50/50 with the Employer through the pain/gain share mechanism. If the Employer's risks materialize, these will be paid by means of CEs. The number of new unforeseen risks is limited. New risks which constitute a change will be rewarded in the form of CEs if they materialize.
Continuous improvement of the relationship ▪ There were <u>no</u> formal meetings or workshops for the purpose of improving the relationship between the Employer and the Contractor. The relationship improves informally on a day-to-day basis. Everybody has made an effort, speaks with each other quite regularly and gets along quite good. There are also some informal events such as a Halloween lunch. ▪ The Employer and the Contractor did <u>not</u> agree on a system or measures for the purpose of improving their relationship during the project. Such measures or formal meetings are <u>not</u> needed on this project. Besides, improving the relationship works better on an informal basis. During the weekly Contractor's meetings, I keep reminding my team that we have to work with the Employer's team as a one team rather than as separate entities. For example, by encouraging them to be as positive as possible towards the Employer's staff and to try to work better together. This helps and once you start doing this, it looks after itself.
Other systems or processes ▪ Other systems or processes than the ones that were already given (see last page) which are relevant for building and sustaining trust between the Employer and the Contractor on this project are: the continuity of employees throughout the whole flood programme. ○ There have been a lot of new people coming in as well. The continuity of people helps, since people get comfortable with each other and create a good working culture together, such culture passes on to the new people. The Contractor has a lot of long-term staff, which makes it possible to have a continuity of people on the flood programme. Long-term employees think further ahead and tend to behave better because they know that they are staying around.

3. Answers given to questions regarding 'changes':

Project objectives ▪ So far, the Employer, the Project Manager and the Contractor have <u>partly</u> complied with the change management objectives stated in the PMP. The parties did <u>not</u> comply with the objective 'design changes after target cost setting kept to a minimum other than to accommodate exceptional or unforeseen events or cost saving opportunities', because the works were <u>not</u> fully designed yet at the time of the target price was agreed. There was a push to start the project anyway because of the funding. The sooner the project started, the sooner it will be finished and the sooner Forres will be protected against floods. There have been quite a lot of changes since the target price was set, which was partly caused by the incomplete design at the start. The parties have handled the changes quite well, because these were expected. Everybody behaved the way they should and gave the designers time to catch up instead of making a big issue about it. ▪ The Employer and the Contractor did align objectives with regard to risk management. Both the procedures and the results were aligned. The procedures allow the parties to manage change quite well and the goals at the end of the day are the cost, the time and the safety of building the scheme.
Risk management ▪ So far, the Employer, the Project Manager and the Contractor have complied with the risk management plans stated in the PMP and in Clause 16 in the NEC2. The parties made a point of having risk review meetings every two months, for example, to go through where we are and what CEs have been discussed, agreed or in place, to look forward what is coming and to check the size of the risk allowances. The risk review meetings work quite well, because the meetings allow the parties to focus their minds and to think about what to do. ▪ Clause 16 in the NEC2 regarding risk management is clear. ▪ The risk management approach by the Employer, the Project Manager and the Contractor during the project is <u>largely proactive</u>. On this project, the parties probably have managed the risks better than on the previous flood schemes, because the parties recognized the risks early on in order to save costs and to avoid losses during the project. All parties are involved and work together to manage the risks. The focus is to turn risks into cost-saving opportunities, which will increase the gain for all parties. The projects is going very well, partly because the weather has been better than anticipated and allowed the Contractor to do things which are usually not possible in certain seasons. In such cases, the risk register helps the parties to find opportunities to save costs, for example, the parties may find that if they get on with 3 elements they will save costs. ▪ Risk management plays a role in the change management procedure. ○ One the one hand, changes may have an influence on the risk probability or impact of other elements. If you make a change and you do not recognize a bigger risk than before the change, a good idea may very quickly become a bad idea because the risk probability or impact may increase much more than you save with the change. So you also have to look at risk when looking at change. ○ One the other hand, risk management can be used to identify changes, but this does not happen very often. On this project, for example, the Contractor found a change when dealing with the risks of the grout curtain. The geotechnical conditions were unknown, so the grout could get into the river, which would affect the programme and the environment. Therefore the Contractor came up with a value engineering change (i.e. the piling solution) in order to mitigate the risks. The change took away the two big risks for the Contractor and also saved the Employer a lot of money, so it was a gain for both parties. ▪ The parties clearly understand the link between risk management and the Compensation Events, but in the NEC2 ECC there are <u>not</u> a lot of words which tie both aspects up.

Change management procedure	
- I do <u>not</u> know why the two rules for change management in the PMP were added to the Compensation Event procedure. These rules may be derived from the lessons learned from the previous flood schemes in order to make the procedure more clear. Maybe there were some incidents on the previous schemes where a change was made and disputed afterwards as to whether that was everybody's idea of what was supposed to happen or was it one person doing something off his own bat. - The project registers are kept in order to make it easier for all parties to record where we are, to keep track of the information exchange, to keep track of the CEs and to manage the CEs. - The clarity of the standard forms (e.g. the boxes and the formats) and the project register (e.g. highlights when no reply yet) have been improved during the project. - So far, the Employer, the Project Manager and the Contractor have complied with the change management procedure. The procedure works quite well, <u>expect</u> for the period of reply sometimes. It does <u>not</u> matter with which contract you are working, because each contract has a way of dealing with variations and you always try to comply with it one way or another. However, other procedures may be less formal, because the NEC is more rigid than most other contracts. - All sub clauses in 60-65 are applied for dealing with change. - The change management procedure is efficient and effective. - The clauses 60-65 in the NEC2 ECC are clear regarding the roles and responsibilities and the types of changes, but sometimes <u>not</u> clear regarding the processes. Once you are used to working with the NEC2 ECC, most of it is fairly straightforward and logical. However, there are several things which are open to interpretation and could cause conflicts, but since this is the fifth scheme, such things have been aligned over time with the Designer and the Employer. - The Early Warning obligation stated in clause 16.1 in the NEC2 ECC plays a role in the change management procedure. The EW is meant to instigate a meeting to discuss what the options will be. This is done most informally of all procedures. On a weekly or monthly basis, we highlight the changes and the circumstances which need to be addressed, but mostly the parties are able to agree to an action and to a CE since most solutions are obvious. So generally, the formal EW meeting is <u>not</u> needed. On this project, there have been only two of such meetings. - It is clear what is meant with EW obligation, but <u>not</u> with the 'aware' part in clause 16.1 in the NEC2 ECC. You can be aware of a problem without being aware that it is actually going to affect the contract and the costs. That can cause a conflict if the Contractor does not give an EW for a problem and months later someone raises a CE for the same problem. The Employer might feel gyped and thinks that the Contractor should have told him a long time ago. We have <u>not</u> really had to deal with such situations on this project, but I am sure it has happened on the other schemes. - The change management approach by the Employer during the project is <u>half reactive/half proactive</u>. Compared to most other clients, the Employer is very proactive as he understands the risks, the changes etc. and how these can affect the budget and the programme very well, he is very aware of what is going on, and he wants to come to the risks review meetings. However, with regard to change management, the Employer relies quite a lot on the Project Manager and the Contractor and only gets involved when he needs to. - The change management approach by the Project Manager and the Contractor during the project is <u>largely proactive</u>. Both parties are very proactive, but there have been some changes which were not anticipated and to which the parties had to be reactive. For example, the flood event during the project could not have been predicted. - The following processes are included in the change management system and are performed by the Employer, the Project Manager or the Contractor:	
9. Before the change takes place, assess potential impact and create a proposed change order	X
10. Document the proposed change in a log	X
11. Determine priority of the change	X
12. Selection of optimum change options by consulting all relevant parties	X
13. Identify the likely impacts of different change options	X
14. (Prompt) decision making as to whether to accept/reject the change by someone with authority	X
15. Communicate final change decision to all team members whose work is affected by it	X
16. Appropriate documentation to record all decisions within the change process	X
5. Monitor and record implementation of the change	X
Remarks: On 10, not in a log, but in a register. On 13, the impacts which are assessed depend on the change. In any case, the Contractor assesses the main impacts which the Employer is concerned about (i.e. programme, costs, safety and environment). For most CEs there are only one or two options, but if there are more options the Contractor does assess the impacts of each option. This is a joint process with the Project Manager and consultants. On 14, the one with authority is the Project Manager. The speed of decision-making depends on the impact of the change. On 16, this is covered by filling out the standard forms. On 5, the status of the change implementation and the costs of the change are recorded in the project register.	
Learning from changes	
- The Employer and the Contractor do <u>not</u> create 'lessons learned' specifically from change events during the project. The parties did have a couple of overall lessons learned workshops, which fed back information to the Project Team and to each of the organizations as well. The workshops also deal with change management issues. - The lessons learned are shared between the parties. - The Employer and the Contractor monitor and measure the financial and the time performance of the risk management processes during the project. As a company, the Contractor also quite regularly measures the performance (efficiency and effectiveness) of the internal procedures during the project and adjust these if needed. This information is passed on to the other parties during meeting, but <u>not</u> in great detail. For example, the Contractor only shares the information on his actual performance compared to his expected performance.	
Other systems or processes	
There are <u>no</u> other systems or processes than the ones that were already given (see last page) which are relevant for creating an efficient and effective change management process on this project.	

- Addition to 'Learning from changes and sharing this knowledge' and 'Early warning': informal.

4. Answers given to extra questions regarding 'trust' and 'changes' (irrespective of the project)

Ranking of the most effective systems or processes for building and sustaining trust between the Employer and the Contractor (C = include in the contract, IC = indirectly include in the contract):

IC	1. Trustworthiness: Culture, policy
IC	2. Joint problem-solving
C	3. Trustworthiness of person: Track record, reputation, competences (financial, technical)
IC	4. Reasonable behaviour
C	5. Joint goal setting
C	6. Equitable risk allocation
C	7. Trustworthiness of organization: Track record, reputation, competences (financial, technical)
C	8. Clearly defined communication system
IC	9. Problem-solving at the lower levels
C	10. Repeated fulfilment of communications and interactions
IC	11. Emotional investments
IC	12. System for continuous improvement of the relationship

Ranking of the most important systems or processes for an effective and efficient change management process (C = include in the contract, IC = indirectly include in the contract):

C	1. Equitable risk allocation
C	2. Early warning
C	3. Joint goal setting for change management & risk management
C	4. Clearly defined change management procedure and roles/responsibilities therein
C	5. Risk management system
C	6. Appropriate documentation of the change process
IC	7. Learning from changes and sharing this knowledge
C	8. Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.

Influence trust on change management process

- 75% of the efficiency of the change management process is determined by the trust level between the Employer and the Contractor. The Contractor submits a CE with the impact of the change. If there is no or little trust, the parties have to employ far more effort to agree on something. There is a lot of communication back and forth, because the Employer wants extra information, wants to verify information or wants to check information. This soaks up both parties' resources.
- 25-50% of the effectiveness of the change management process is determined by the trust level between the Employer and the Contractor. If there is no or little trust, the Employer will be more reluctant to agree to the problem or to believe that there is a problem. This reluctance is based on a mixture of things. Quite a lot is based on the personal characteristics and the history between the parties. So even if all facts are clear, the trust level between the parties may affect the Employer's decision. In addition, nothing is completely black and white, there are always grey areas on which the parties disagree.

INTERVIEW REPORT #6C

Interview:	Project Forres (River Findhorn & Pilmuir) Flood Alleviation Scheme
Date of interview (DD/MM/YYYY):	29-10-2014
Time:	14.00 – 16.00h
Location:	Site Compound (29 West Road, Forres)
Interview planned by:	Lonneke Cheung
Date of report (DD/MM/YYYY):	26-01-2015
Validated (DD/MM/YYYY):	09-01-2015 (deemed acceptance)

1. Attendees				
Initials	Name	Role/Function	Company	Email
LC	Lonneke Cheung	Graduate Intern	TU Delft/RHDHV	-
RM	Ryan Main	Commercial Manager	Morrison Construction	-

2. Answers given to questions regarding 'trust':
Trustworthiness during procurement
- I was <u>not</u> involved in the procurement phase. - Each project has been a CE to the original base contract.
Reasonable behaviour
- Clauses 10.1 and X12.3 in the NEC2 ECC (spirit of mutual trust and co-operation) have an influence on the behaviours of the Employer, the Project Manager and the Contractor. It is the basis on which the NEC was built around and is a key statement and a critical element of all NEC contracts. On this project, it is something that everybody has fully embraced. In 2002 at the start of the flood programme, everybody was probably looking quite closely at that, but then it becomes a natural thing as you know that that is how everybody should behave no matter of that clause. By the time you get to scheme number 5, it should be an inherent thing that everybody knows. That is probably why all projects have been delivered well because everybody acted in that manner from the start. - It is clear what is meant with clauses 10.1 and X12.3 in the NEC2 ECC. It is like a background clause which everybody knows it is there and everybody knows how to act. The basic understanding of what was intended is there as a core clause. However, the clause is open to interpretation. For example, how do you define co-operation and how far do you go to co-operate? - The principle of good faith in Scots law <u>probably</u> has an influence on the behaviours of the Employer, the Project Manager and the Contractor. It probably has an influence without the defined thought that we must do this. The relationship and trust have been built up and there is a kind of feeling that everybody has that understanding of good faith and acts in good faith. It is not something that is necessarily written down or defined as being good faith. Good faith has developed over time and just happens. - For example, if the Employer and the Contractor discuss an element of the works in the contract, the parties will agree that the Contractor will do certain things. In good faith the Contractor may go and do some necessary additional things and trusts in good faith that the paperwork will tidy itself up later. - The joint project objectives with regard to the relationship in the Project Charter <u>probably</u> have an influence on the behaviours of the Employer, the Project Manager and the Contractor. When there are joint project objectives, you all try to achieve the same thing. You probably do not realize that you are doing it day-to-day, since it is also an inherent thing that happens. It is <u>not</u> necessarily needed to read the Project Charter every day to understand what they are. The objectives in the Charter are things which are already quite embedded in the project's health and safety culture and are about a general understanding and wellbeing for everybody. Everybody recognizes poor behaviour and understands how to behave. We are all professional and experienced people and we know each other, so 9 times out of 10 we will behave properly. Generally speaking, we know that these objectives are there, but we do not necessarily look at these every day.
Project objectives
- So far, the Employer, the Project Manager and the Contractor have <u>largely</u> complied with the project objectives stated in the Project Management Plan and the Charter. There is a consistency of people on the projects, so there are a lot of people who understand those core values of the early stages. The relationship between the Employer and the Contractor has been developing since 2002 and has created a sort of mindset. - The project objectives were derived from the lessons learned from the previous flood schemes, so the focus is on how to deliver this scheme better than the previous ones. On both sides we have experienced people, therefore we know what is achievable and realistic. - Option M (limitation of Contractor's liability for his design to reasonable skill and care) was <u>probably</u> chosen because 'reasonable skill and care' is a pretty good statement and a very realistic objective to be expected from an experienced contractor to achieve, whereas 'fitness for purpose' is a very difficult statement to achieve. The definition of 'fitness for purpose' is quite hard, so it is a very difficult thing to get it right in order to, for example, cover an element for fit for purpose with insurance. - In some cases the designs of the Contractor and the Designer (RHDHV) overlap. It is very important to define the relationships regarding the liability for the design work. Preferably these are linear, which implies that the same quality standard (e.g. reasonable skill and care) applies for the Designer, the Contractor, the sub-contractors etc.
Communication
- So far, the Employer, the Project Manager and the Contractor have complied with the communication and information plans stated in the Project Management Plan. Overall, the communication plans work well, in places it can be quite rigid and set, but there are <u>no</u> huge problems at all. Things may be forgotten or may not be prioritized, but generally they are minor problems. Most things are dealt with within a month. Besides these plans, the parties also communicate by means of email and general informal face-to-face discussions, for example, if someone has a question. - The NEC is a good contract, but it requires a lot of paperwork. The formalized template documents create a standard, so the paper chain is kept clear, which is critical. The standard forms allow you to follow all NEC procedures well. The audit trail is easy

to understand to check what has happened and when. Communication is easy to follow since we keep a set of registers, which basically logs when documents are released, responses are received etc. ▪ So far, the Employer, the Project Manager and the Contractor have <u>largely</u> complied with Clause 13 in the NEC2 ECC (communication), <u>except</u> for the period of reply sometimes. The NEC2 is a little bit open-ended in terms of the period of reply and in the Contract Data you can specify that it will be two weeks, but there is <u>no</u> time-bar which says that if parties do not comply with this, it is deemed to be accepted, which is something the NEC3 does cover. The way that the project has worked, it does <u>not</u> become a big problem. The period of reply is defined, but we understand it is against the good faith and mutual trust and co-operation elements. These elements become prevalent when it comes to the reply period. In some cases it is difficult to comply with the two-week reply period, for example, because people are very busy trying to meet a deadline. As we go along, people are prioritizing things for others to reply to (e.g. by separating the critical and the non-critical things). The period of reply is <u>not</u> very strict on both sides. ▪ Communication according to the NEC2 ECC and the Project Management Plan is a lot of administrative work, but it is <u>not</u> a problem. It is a necessary thing, because if you do <u>not</u> have that audit trail, there is <u>not</u> the same understanding when people are looking back at things. Besides, it is an inherent part of the NEC that is a requirement. It is the nature how you communicate and how the contract is meant to work. The amount of correspondence depends on how the Contractor and the Project Manager resource their teams. On this project, we both have persons whose main job is to manage and deal with the project registers. They are like a central hub for information exchange. So the project registers are centrally controlled, which is cleaner and far more easier to manage the information exchange between the parties. ▪ The Employer, the Project Manager and the Contractor have informal contact with each other by means of the co-location. Informal contact is a day-to-day requirement and happens for the right reasons because we have a common objective and we have to talk to each other in order to achieve that objective. We discuss and agree things informally face-to-face, which keeps everything quite relaxed as there is no pressure to get things done quickly. If necessary, things can be confirmed by email afterwards. This way of working works quite well and keeps the relation aside of things.	
Problem-solving	
▪ So far, the Employer, the Project Manager and the Contractor have complied with Clauses 60-65 in the NEC2 ECC (Compensation Events). The dispute resolution clauses (90-93 and Y(UK)2 have <u>not</u> been applied yet, since there have been <u>no</u> disputes which needed to be escalated to arbitration or the court. We have arrived at a stage where there are no contentious issues. So far, all problems were resolved through the informal route or by other means. There is an understanding that nobody wants to go down that route of arbitration or litigation, particularly since we chose to work with the NEC contract. ▪ The CEs are still manageable. In the initial period when the drawings, specifications etc. are studied, issues may come up and require a resolution or a PMI for a change. If you move along, you can smooth these things out as you go. There will always be busy times where the period of reply is <u>not</u> strictly adhered to as should be due to high workloads and limited resources. Then again, we come back to the mutual trust and co-operation element. People can trust that things will be dealt with anyhow and have to understand that if it is not really a critical thing, we must not disrupt everything for it. ▪ The impartiality of the Project Manager is <u>not</u> an issue on the project. I think the Project Manager always acts impartially and carries the role as should be according to the NEC. Impartiality is critical, because the Project Manager manages the project. On this project, it has worked really well. The flow of information is right and the contract processes have been right. In terms of late CEs, when a PMI has been issued, there is an understanding that the Contractor then acts upon it and notifies it and subsequently the process starts. ▪ The Compensation Events (CEs) do <u>not</u> have an influence on the trust level between the Employer and the Contractor. Most CEs stem from a PMI. Other CEs may be initiated by the Contractor. When we have identified something as a change, we notify that to the Project Manager in a great manner and generally there is an agreement that it is a change, so it will be followed up by a CE. Sometimes you can come into these things from different angles, but it is up to the Project Manager to straighten the Contractor's position. The whole claim mindset (i.e. traditional costs and traditional resources) can delay the programme etc. On this project, the Contractor found efficiencies, better ways of doing things and scope changes which have led to negative CEs, and thus a reduction of the target cost. We are generating a project cost-saving overall, which needs to be made visual to smoothen the relationship between the Employer and the Contractor. If all CEs are positive, people start looking at risks effectively and their expenditure, and start getting worried. On this project, we manage the project well enough that we understand that we are comfortable with how things are going and there is <u>not</u> that contractual drive for the Contractor to make more money and that contractual drive for the Employer to keep the budget tight. ▪ In order to solve problems by amicable agreement the parties do the following: ○ First, informal discussion prior to sending the formal documents, otherwise it creates a bit of hardness to the relationship which does not work. The parties discuss the problem, look at how best to solve it, come up with a proposal and agree to it. ○ Second, collaboration and mutual help by email or verbally. This is necessary to achieve the common objective. ○ Third, early warning. In some cases the EW plays a role. On this project, the formal EW is <u>not</u> used a lot. Due to having regular discussions, the parties recognize potential problems and notify others before it becomes anything. So, there are more informal EWs than formal EWs. ▪ So far, all problems were resolved by amicable agreement at the lowest levels. Most of the critical things are dealt with on site, the partnership made this possible. Management gets involved when nobody on site has the authority to accept or reject certain things, then we would have to go to the director level. This did not happen very often. On this project, some things (e.g. finance and accounting things) were escalated to inform the parties, to get approval and an agreement since these things were going to be done differently.	
Risk allocation	
▪ The risk allocation between the Employer and the Contractor in the contract is clear. Because of the Early Contractor Involvement on all projects, the understanding of risks and how these should be allocated proportionately has been quite clear from the outset. There was quite a quick consensus on the risk allocation. There were probably a few risks left which needed to be discussed and allocated. Throughout the contract the risks are reviewed regularly. In terms of the Contractor's risks, we manage these. The Employer's risks are managed by the whole Project Team, so everybody understands the risk allocation and how the risks are managed.	

▪ Risks are allocated to the party best able to manage them. Because of the experience of both parties, we know what the risks are and what the effect of those risks is (e.g. impact on costs and programme). Therefore, we know which risks are better borne by the other party. So there will be a general understanding about what a fair risk allocation is (e.g. regarding the threshold of the flood event risk) and what can be expected from a party who carries the risk, which makes the process easier to manage. Through experience, you can better manage and mitigate risks. ▪ Option C (the Employer and the Contractor share the financial risk) was chosen instead of the other main options because the Contractor was quite comfortable with the design and this Option incentivizes both parties to look for different ways of doing things and therefore it promotes the partnership. ○ On the one hand, if the design is not quite complete or has quite complex elements, it could lead to a lot of change management. The design changes during the project become CEs. A great number of CEs becomes a heavy thing to manage for both parties. On the other hand, if the design is quite advanced, quite comfortable and looks holdable at the end of the day to price it right, then Option C is probably the way to go. ○ In Option A (fixed price) the Contractor takes most risks and in Option E (cost reimbursable) the Employer takes all the risk. Option C is a bit in the middle of these two options and in Option C the risks are allocated well. There is an incentive for both parties to improve financially and contractually through the pain/gain share mechanism. This mechanism creates an ethos where you really need to work closely together for the common objective so that you could save on the programme and costs in order to create a gain share. So it creates a good partnership from the start, but you have to have that basis of the pain/gain share mechanism through Option C. ▪ In theory, the pain/gain share mechanism does create an incentive for the Contractor to issue a lot of CEs to increase the target cost. However, if we issue CEs for everything that looks like a change, it will affect our relationship with the Employer and mutual trust and co-operation starts to break up slightly. All flood schemes are CEs, which creates an incentive for the Contractor to perform well. Besides the common project objectives, the parties also have other common objectives, which are the next flood scheme and the maintenance of the relationship. So it is <u>not</u> really worth it for the Contractor to push it. To make this decision you have to consider all consequences, which is somewhat like risk management. ▪ Besides the financial risk, the Employer and the Contractor do <u>not</u> share any other risks in terms of liability. Sometimes the parties are needed to manage each other's risk, which is more the case for the Employer's risks. In addition, there is a threshold for the flood event risk. ▪ If the Employer's risk allowance is <u>not</u> used, the budget savings will be for the Employer. The Contractor's risks are included as a risk allowance in the target price. If the Contractor's risk allowance is <u>not</u> used, the budget savings will benefit both parties through the pain/gain share mechanism. However, the parties have an understanding that if the risk allowances are needed to be used, they should be used. New unforeseen risks are Employer's risks. If these materialize, they become CEs. Quantification risks are Contractor's risks.
Continuous improvement of the relationship
▪ There were lessons learned workshops at the end of the previous flood schemes, which feeds into the objectives and to tailor these to suit, but it was more to discuss what we did well or not so well in order to see what can be done the same or what needs improvement next time. The workshops are just a case of managing the relationship on a project-to-project basis. Within the project, continuous improvement is something which happens informally on a day-to-day basis anyway, therefore it is <u>not</u> needed to formalize this. ▪ The Employer and the Contractor did <u>not</u> agree on a system or measures for the purpose of improving their relationship during the project. This was <u>not</u> needed since the relationship improves informally on a day-to-day basis.
Other systems or processes
▪ Other systems or processes than the ones that were already given (see last page) which are relevant for building and sustaining trust between the Employer and the Contractor in this project are: consistency of the organizations and its people. ○ This consistency helps to deliver the schemes and to build relationships. The Contractor, for example, has a core team of people who have worked on a number of these projects. There is a consistency of people from top level to the lowest level that carries through all projects, so that the values that people are required to achieve are going to be kept running through. The Project Team is not the same for each project, but the common objective is. So provided the relationship and trust is built, then that common objective is still achievable. ▪ Remarks: A lot of these things are core things within NEC which the NEC tries to lead you towards. Through experiences we have managed to achieve these, maybe not always by how it is written in the clauses or in the Contract Data, but by how we behave with each other and by how things are meant to work.

3. Answers given to questions regarding 'changes':

Project objectives

- So far, the Employer, the Project Manager and the Contractor have complied with the change management objectives stated in the PMP. The design changes have largely been made to accommodate fairly unforeseen things. 'Cost saving opportunities' is very much a collaboration element between the parties. The target price was based on a design. As an experienced Contractor, we may have different ideas for that design.
 - For example, the grout curtain over at the West Forres embankment. There were some risks because of the ground conditions. The grout might end up in the river and cause a major issue with the environmental groups. Therefore, we proposed to do sheet piling instead to create the same effect. This option was possible because the ground investigation showed that there was rock below the stratum. The proposal was submitted to the Project Manager and the Employer. They accepted it, but its risk may have shifted a bit towards us. Provided that the Contractor had designed it with reasonable skill and care, the liability for the design is limited due to Option M. The design change saved half the target cost, which fed back into the pain/gain share.
- The Employer and the Contractor did align objectives with regard to risk management. We have to do this, because the common objective is there. We have conducted the risk workshop together before the project begun in which we analysed the risks and discussed how we could manage these. At the outset, we had a clear understanding of how to manage the risks, therefore the process works a lot better.

Risk management

- So far, the Employer, the Project Manager and the Contractor have complied with the risk management plans stated in the PMP and in Clause 16 in the NEC2. The Employer, the Project Manager, the Contractor and the Cost Consultant are the key parties in terms of managing the risks. The monthly risk review meetings involve going through the Employer's risks register and looking at where the outstanding risks are. As the project progresses, a lot of the risks (e.g. design changes) should be gone, mitigated or minimized. Some risks, like the flood risk, will remain till the project is finished. Our joint experience together during these meetings will dictate or stipulate how we look at the risks and how to assess them (e.g. change, keep or remove). The regular monthly risk review meetings help you to create a far better understanding of the risks and a far better feeling of how best to manage them. In addition, we look at the financial part of the project, for example, what the expected Contractor's costs will be to complete and whether this exceeds the final target cost, so that we can see whether we are in a pain or gain situation. This financial update gives a good overall picture of where the project is going. At the moment, we are fairly comfortable with where it is going and so are the others. Any setbacks (e.g. the pumping station may require much more work or money) will be managed. We are always on top of such things and control it at every stage. Everybody does that really well and it works well.
- Clause 16 in the NEC2 ECC is quite clear in terms of the EW side of things, but experience (i.e. gained from scheme to scheme and from working with the NEC jointly) tells us that we need to do this anyway and that we are quite good in doing it. Joint risk management has worked very well. The EWs are used to mitigate risks. We flag up if there is a risk to something and the EW wants us to mitigate the risk. If we cannot mitigate it, it becomes a CE or a risk item. On this project, there have not been a lot of EWs and we do not really focus on the EWs, because the need to raise EWs is mitigated a lot since we are managing the risks quite effectively day-to-day and by means of the risk review meetings. Risk management is quite a key thing on this project.
- The risk management approach by the Employer, the Project Manager and the Contractor during the project is largely proactive. There is always something which can be done better, therefore it is not entirely proactive. We are doing the risk review meetings together. We understand the project as well as we do in terms of the design specification, the works information and so on. We understand our own individual risks as well as the other's, because all project risks affect both parties. We understand what we need to do to manage the Employer's risks together. We look at the common objectives. All these things make risk management a lot easier.
- Risk management plays a role in the change management procedure, because if you mitigate a risk, there is a likelihood that change management is required. In addition, mitigation measures may comprise changes.
 - If there is a risk and it materializes, then change management is required. If the risk is mitigated or reduced, then change management is not such a prevalent issue. Change management is very much a linear thing to risk management. Contractually you have the EW. If the EW is not dealt with, it becomes a CE, which affects the target cost and the pain/gain share. If you mitigate the risk at the outset, it saves the need for change management to become a critical thing thereafter.
 - If a mitigation measure comprises a change, it depends on the effect of the change whether it will be implemented or not. The effect of the change (i.e. the reduction of the risk) has to be bigger than the cost of the change.
 - We try not to use risk management to identify areas where changes are likely to occur. If we spend our time looking at these, we take an eye of our objective, because the aim of these is to cover any issues which may arise. So if we are looking out at things which may arise, then we are not managing the project well. To manage the project well, we have to work towards the objectives described in all the documents. If there is an unforeseen event, we have a risk allowance to cover that and use it. We do not look at the risk register as taking that the risks are there and in the sense that we are looking for things which might happen. If they happen, they happen and if we think it may happen, we try to stop it from happening.

Change management procedure

- The rules for change management in the PMP were probably added to the Compensation Event procedure to clarify the Project Manager's or the Employer's way of working regarding change management. The rules are perfectly valid and clear and it has no harm to add these. The rules set out how they expect the Project Team to behave and how they expect themselves to behave.
 - The PMP and the NEC2 ECC are compatible. Any contradictions in the contract documents would be raised by the Contractor as issues early on. The contract is the thing we have to operate to and the PMP is like an instruction manual for how we should do it, so the two cannot be contradictory.
- The project register is an overall management tool, which everybody can see, use and benefit from. The tool is used to manage the flow of paperwork as the NEC procedures requires a lot of it. The project register tracks changes (e.g. when things are raised and responded) and allows the register keeper to make sure that the right documents are forwarded to the right persons. The project register is one of the best things in terms of consistency as it is used on every flood project. Therefore, people are pretty much used to working with it.
 - It is important to track the CEs on the project registers as each one carries a value which may affect the target cost. The registers give you a picture of where things are in terms of the financial position and the programme position.
- So far, the Employer, the Project Manager and the Contractor have largely complied with the change management procedure. Certainly in terms of knowing what we should do and what each party should do. The PMP sets this out quite well. The procedure works quite well, except for the period of reply. The reply period differs case by case. It is important to indicate the priority of the communication in the project registers.
- Another improvement made to the change management procedure is the provisional allowance for certain design elements, which is something that is not dealt with in the NEC. At the time of target cost setting, the Contractor was not fully comfortable with the design of certain elements and with putting a price against them. Therefore, a provisional amount of money was put against it. Once the design is fixed, this amount will drop from the target cost and will be replaced by the actual figure. Instead of rigidly following the change management procedure of the contract, this is another way to manage changes and requires trust of both parties to put a figure in there first and to manage change thereafter. It allowed a bit more workability between the two parties and it also allows a bit more engagement in terms of design development and collaboration together to come up with solutions that supersede the provisional allowance.
- The clauses 60-65 in the NEC2 ECC are largely clear regarding the processes and very much clear regarding the roles and responsibilities. The types of changes are also clear since it is clear what needs to be done when something happens. The mechanisms allow you to deal with such changes through EWs, CEs, PMI's etc.
- The Early Warning obligation stated in clause 16.1 in the NEC2 ECC plays a role in the change management procedure if the EW warns for a risk which cannot be mitigated or managed properly. The EW should be seen as a means of avoidance of an issue

that may happen. The EW encourages people to sit down together to discuss what the problem is and how to deal with it. If the risk <u>cannot</u> be mitigated, you can use the risk allowance. ○ The EWs can sometimes be quite scary for people as they read them as money and automatically think EWs will result in CEs and increase the costs. In reality, the EW warns you for something that is there early on and it creates an opportunity for you to do something about it before it materializes. ○ The EW is <u>not</u> the same as early identification of a change. The EW is related to something that is going to happen and you may be able to do something about it to prevent it from happening, whereas early identification related to something that might happen. ▪ It is clear what is meant with EW obligation in clause 16.1 in the NEC2 ECC. The 'aware' part in this clause is a great thing. As soon as you know it, you go around the table to talk about it and try to prevent it from becoming anything. If you wait any longer, the likelihood that it becomes something becomes bigger. So the effect is that you give yourself and others more time to deal with it. However, it is a moral obligation which is closely related to trust. You must trust each other that you are actually going to raise an EW as soon as you become aware. ▪ The change management approach by the Employer, the Project Manager and the Contractor during the project is <u>largely proactive</u>, because there is an understanding at both sides that we want a smooth-running project. We do not want issues to occur or matters to arise regarding the contract, so that the parties have to sit around the table all the time. The parties want everybody to be proactive in change management. For example, we talk a lot and deal with things a lot, which nullifies risks of becoming a bigger thing. ▪ The following processes are included in the change management system and are performed by the Employer, the Project Manager or the Contractor:	
9. Before the change takes place, assess potential impact and create a proposed change order	X
10. Document the proposed change in a log	X
11. Determine priority of the change	X
12. Selection of optimum change options by consulting all relevant parties	X
13. Identify the likely impacts of different change options	X
14. (Prompt) decision making as to whether to accept/reject the change by someone with authority	X
15. Communicate final change decision to all team members whose work is affected by it	X
16. Appropriate documentation to record all decisions within the change process	X
5. Monitor and record implementation of the change	X
Remarks: On 11, this is not a procedural thing, but it happens informally. On 12-13, by means of a business case. On 14, the speed of decision-making largely depends on the priority of the change. On 15-16, by means of the registers and the distribution of information.	
Learning from changes	
▪ The Employer and the Contractor do <u>not</u> create 'lessons learned' specifically from change events during the project, but there have been overall lessons learned workshops. To improve the change management procedure, in some cases we look at how we can manage and control changes better from one project to another. We may find a better way of doing it by looking back at the formal documents. For example, we may find out that it helps to prioritize them better. ▪ The lessons learned were shared between the parties as the workshops were jointly. ▪ The Employer and the Contractor do <u>not</u> measure the performance (efficiency and effectiveness) of the risk management processes during the project and adjust these if needed. The risk review meetings are regular and held every month, which is the right frequency to do that. As long as it happens every month and you are on top of it and aware of it, then it is fine and it is not needed to be monitored to see whether you do it often enough. It is quite clear how we are managing the risks and it is working. So there is a natural measurement there.	
Other systems or processes	
▪ Other systems or processes than the ones that were already given (see last page) which are relevant for creating an efficient and effective change management process in this project are: informal discussion.	

4. Answers given to extra questions regarding 'trust' and 'changes' (irrespective of the project)	
Ranking of the most effective systems or processes for building and sustaining trust between the Employer and the Contractor (C = include in the contract:	
C	1. Trustworthiness: Culture, policy 2. Reasonable behaviour 3. Consistency of people 4. Trustworthiness of organization: Track record, reputation, competences (financial, technical) 5. Joint goal setting 6. Repeated fulfilment of communications and interactions 7. System for continuous improvement of the relationship 8. Clearly defined communication system 9. Joint problem-solving 10. Problem-solving at the lower levels 11. Equitable risk allocation 12. Trustworthiness of person: Track record, reputation, competences (financial, technical) 13. Emotional investments
Ranking of the most important systems or processes for an effective and efficient change management process (C = include in the contract:	
C	1. Clearly defined change management procedure and roles/responsibilities therein
C	2. Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.
C	3. Joint goal setting for change management & risk management
C	4. Appropriate documentation of the change process
	5. Learning from changes and sharing this knowledge
	6. Informal discussion
C	7. Early warning
	8. Equitable risk allocation
C	9. Risk management system
Influence trust on change management process	
▪ 75% of the efficiency of the change management process is determined by the trust level between the Employer and the Contractor. If there is a lot of trust, the Employer is going to trust that the Contractor is going to manage it efficiently using the right resources and the right time to keep things moving. If there is no or little trust, the Employer must use more resources (time, money etc.) to check whether the Contractor is doing what he needs to do. The other 25% is the good faith element. ▪ 75% of the effectiveness of the change management process is determined by the trust level between the Employer and the Contractor. If the procedures are in place, trust is still needed to be effective and to prevent you from worrying about things or focusing on the wrong things. Trust comprises of that mutual understanding and feeling that everybody is doing what they need to do. You must trust others that they are going to meet your expectations and are delivering what they should in terms of the project. The basis of that trust is the experience and the consistency of working together. For example, through experience you will know whether someone has enough competencies to do it.	

31. Forres: Assessment data

31.1 The British culture

Power Distance Index (PDI) score 35 (L)

In small power distance cultures, all should have equal rights, parties will always negotiate, parties treat all business partners and potential business partners equally, decisions to deceive, trust, and forgive are not influenced by the other party's status, and trust is equally important in every relationship, regardless of the other party's status (Hofstede et al., 2010, pp. 72, 76, 83; Verwaart, 2011, pp. 19, 114, 118).

Individualism versus Collectivism (IDV) score 89 (VH)

In individualistic cultures, parties feel free to do business with any party, negotiate prior to the formation of a relationship, only pursue their own personal interests, depend on their personal judgment and will be more careful to trust, and show distrust as it is. The thresholds for opportunistic behaviour, trust and forgiveness are based on personal relations and the personal interests in these relations (Hofstede et al., 2010, pp. 113, 124, 130; Verwaart, 2011, pp. 19, 104-108).

Masculinity versus Femininity (MAS) score 66 (H)

In masculine/performance oriented cultures, parties do business with anyone, focus is on performance, trust implies enforceable trust (i.e. trust in good performance that is backed up by the option of rewarding and punishing the trustee), implicit trust is low and if you get cheated upon it is your own fault and you are a loser (Hofstede et al., 2010, pp. 155, 170, 180; Verwaart, 2011, pp. 18, 90-91).

Uncertainty Avoidance Index (UAI) score 35 (L)

In uncertainty tolerant cultures, parties suppress their emotions and aggression, are willing to take unknown risks, do not need rules to trust, are not hesitant to do business with new partners and do not particularly distrust them, and may be tempted to do deceit in order to make extra profit (Hofstede et al., 2010, pp. 203, 208, 217, 223; Verwaart, 2011, pp. 20, 132-135).

Long-Term Orientation versus Short-Term Normative Orientation (LTO) score 51 (M)

In long-term oriented cultures, parties will not put a relationship with a business partner at stake by deceiving, value their relationships, focus on building a strong market position, and avoid the risk of damaging their relationships. Whereas in short-term oriented cultures, parties may be tempted to do deceit in order to make extra profit, tend to grab a chance for an easy profit and are willing to put their relationships at stake for it, focus on transaction bottom line and quick profits, and are more opportunistic and analyze a deal in terms of pay-off rather than a relational network (Hofstede et al., 2010, pp. 243, 251; Verwaart, 2011, pp. 21, 147-150).

Indulgence versus Restraint (IND) score 69 (H)

In indulgent cultures, parties have a perception of personal life control, have less moral discipline, and have a positive attitude (Hofstede et al., 2010, pp. 291, 297).

31.2 Assessment of trust in the project

Table 109: Assessment model for trust on project Forres

Objective	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)	
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	3.5
			(2) Seek party with similar culture/policy	3	3.5
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	4
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	3.5
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	3.5
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	3
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	2
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	3.5
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	3.5
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	3.5
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	2
TOTAL LEVEL OF TRUST RELATIONSHIP			2.91	3.23	

(1+2) Trustworthiness (ability, integrity and predictability)

Main findings:

- A. The procurement of the Contractor took place in 2002-2003 and the procurement strategy adopted best practice guidance for construction procurement at that time, which was quite similar to 'best value procurement' nowadays. The aim of the procurement was to award the contract to the Contractor who provided Best Value for Money. For tender evaluation purposes, the Employer applied a quality/price ratio of 70/30. The contract was put out to European tender and the works consisted of constructing the Lhanbryde

scheme and assisting in the design development of the other schemes. The other flood alleviation schemes would only be awarded to the Contractor after satisfactory performance and formal committee approval of an agreed price which complied with the conditions of the contract in order to ensure value for money (The Moray Council, 2006). The procurement route consisted of three stages. The first stage consisted of gathering all tenderers who have expressed interests in the contract and long list of nine contractors was drawn up, which were invited to submit a response to the pre-qualification exercise of the second stage. The purpose of this exercise was to short list up to five Contractors that have demonstrated capability to contribute towards collaborative working (including in the design), relevant experience and a forward thinking culture, project management ability and familiarity with partnering, target cost contracts and pain / gain share, and cultural convergence with the Moray Flood Alleviation Group and the ability to jointly deliver all the project objectives (Moray Flood Alleviation Group, 2002). Subsequently, the short listed candidates were invited to submit a price and quality bid in the final tender stage, which consisted of three components: a target cost for Lhanbryde, a price for assisting in design development, and a price for other schemes based on the fee percentage applied to the Lhanbryde scheme, where actual cost of this work would be £30 million (The Moray Council, 2006).

- 3/6 interviewees (#1E, #2P and #5C) were directly involved in the procurement phase.
 - On the one hand, according to the Employer's team, the tender stages were sufficient to determine the contractors' trustworthiness (ability, benevolence, integrity, predictability and reliability) to carry out the project. #1E argues that the setup of the procurement was not without risk, because there is the risk that the Employer might get it wrong as the contractors knew what the Employer was looking for and usually they are very good in filling in these quality submissions. Therefore, the Employer engaged in dialogues with the contractors in both tender stages, but particularly in the second stage. One of the things the Employer did was to visit a live construction site with each of the contractors. The purpose was to show the contractors around, to discuss with them how the site was working and to spot the flaws by checking the consistency between their submissions and their behaviours on site (e.g. do they really meant what they said and whether everyone in the organization speaks with the same view). The organizational culture (e.g. how people related to each other, what was the power distance in the organization and how were people enabled), the competences and the benevolence of the contractors were the most important factors in the procurement phase. #2P also argues that the Contractor's culture had to match with the team that was already in place which consisted of The Moray Council (the Employer) and Royal HaskoningDHV (the Designer). #1E states that the interviews were quite revealing as some contractors were not very consistent.
 - On the other hand, according to the Contractor's team, the contractors could demonstrate during the tender stages how trustworthy they were to carry out the project. The tender process was quite thorough. The Contractor had to send in documents for the Employer to review and there were meetings and interviews through which the Employer should have been able to get a fairly good view of, for example, what sort of company they were, the kind of culture of the company and as to whether they were going to be open and honest. The tender procedure worked well since it helped the Employer to decide which contractor would be the easiest for them to work with or fall in line with their way of doing things.
- B. There is nothing in the project records regarding any requirements for the Contractor's team on the personal level.
- 3/6 interviewees (#1E, #2P and #5C) were directly involved in the procurement phase.
 - According to the Employer's team, during these dialogues and site visits, the Employer did not want to speak with the marketing team, but specifically asked for the people who were actually going to be working on the job. #2P states that the Employer was looking for local representation and a Contractor with long-term employees (more certainty of continuity of people on the projects). Up to now, the core teams of the Employer, the Designer and the Contractor have remained the same, so the Project Team knows what the aims were at the start of the flood programme and is still working to deliver the same goals.
 - According to the Contractor's team, the Employer indeed held such interviews in which the Employer could actually meet and judge the key people who were going to be involved in the projects. In addition, the Employer also checked the CV's and spoke with the referees of these people. #5C further states that this method is the best way for the Employer to get a good picture of how the key people are instead of just submitting a tender.

(8) Trustworthiness (integrity and benevolence)

Main findings:

- A. Clause 10.1 states that the Employer, the Contractor, the Project Manager and the Supervisor, (and Adjudicator) shall act in a spirit of mutual trust and co-operation. Further, as stated in §24.2, if the Project Manager has valid reasons (e.g. someone acts unreasonable), he may instruct the Contractor to take an employee away from the project.
- 6/6 interviewees state that clause 10.1 does not have an influence on the behaviours of the parties, or at least not directly. There are several reasons for that.
 - 2/6 interviewees (#1E and #3P) state that the clause forms a good basis for building trust and to start the project, but the creation of trust is very dependent on the Project Team (i.e. the people who are running the contract), which is in line with what (Gould, 2007, p. 28) and (Heaphy, 2012, p. 25) state. #3P argues that she has worked on three different schemes. Each scheme had the same NEC contract and the same Contractor, but the Contractor's teams and the Project Managers were different. The differences between the three teams are noticeable and big regarding trust and co-operation. If you have the right people delivering the project and the right people involved, then you will more likely create 'a spirit of mutual trust and co-operation' and get what you want as the end product. Therefore, #5C argues that the selection of people is essential and you have to check whether you have people who are willing to work that way, and that these words in the contract do have an added value as it implies that if anybody does not act like this, he/she can be asked to be taken off the project. #1E argues that if the parties in the Project Team do not build trust, the Employer has to intervene with, for example, workshops or trying to change people's behaviours. Such interventions were not needed very often and it has been some time since the last one. Everybody knows each other too well and it comes to a point that all parties become dependent on each other and have to work not to let each other down.
 - 2/6 interviewees (#2P and #5C) argue that the 'a spirit of mutual trust and co-operation' cannot be created by words, because words do not really influence people too much. #2P states that such culture can be created by, for example, a good working relationships from the start, a clear understanding of what the objectives are and an agreement that all parties can work together to achieve the common objectives.
 - 2/6 interviewees (#4I and #6C) argue that this principle forms the whole basis of the NEC contracts and everyone adheres to it on this project. #6C states that by the time you get to scheme number 5, it should be an inherent thing that everybody knows and #4I states that at the start of the project, a high level of trust was already in place between the parties which has been built up

- over time, for example, by means of the past co-operations on the other flood schemes, the continuity of staff and the joint lessons learned workshops.
- 6/6 interviewees state that the intention of the clause is clear. However, there are some additional comments. #1E and #2P state that it cannot be enforced. For example, how could you go to the Contractor and say: 'I do not consider that you are trusting me or that you are not co-operating with me'. #3P and #6C state that it is open to interpretation and thus its effect depends on how the people involved interpret it. #3P states that this project is probably the best out of the three she has worked on regarding trust and co-operation. It is much easier to work with the Contractor on this project.
- B. According to the Contract Documentation, the law of the contract is the law of Scotland and is subject to the jurisdiction of the Courts of Scotland. Scots law is a mixed legal system containing civil law and common law elements and includes the principle of good faith.
- 3/6 interviewees (#1E, #2P, and #5C) are aware that this principle in Scots law is part of the contract and state that it has an indirect influence on the behaviours of the Employer, the Project Manager and the Contractor, because most people are not so knowledgeable of the law. Scots law is embedded in the culture of Scotland and therefore people deal with this principle, probably unknowingly, when growing up in Scotland. People are governed by others and tend to behave the same way as them. #5C argues that anybody who is fairly experienced in the construction industry knows the real effect of the law, so it does influence more directly how he/she behaves.
 - 2/6 interviewees (#4I and #6C) argue that all parties have that understanding of good faith and act in good faith. #6C states that this has been developed over time and is not because it is written in the law. #4I argues that it is probably in a person's characteristic anyway to act in that manner.
 - #6C gives an example of acting in good faith: if the Employer and the Contractor discuss an element of the works in the contract, the parties will agree that the Contractor will do certain things. In good faith the Contractor may go and do some necessary additional things and trusts in good faith that the paperwork will tidy itself up later.
- C. The project directors of the three parties signed a Project Charter in August 2012 with regard to Health, Safety and Environment which includes project objectives regarding the relationship between the parties.
- The answers given vary a lot, so it is questionable as to whether the joint project objectives regarding the relationship in the Project Charter have an influence on the behaviours of the parties.
 - According to #3P and #4I, the Project Charter was derived from the previous flood schemes and has been reviewed for this project.
 - #1E states that you can probe people back to that Project Charter, for example, by means of surveys, but it is only useful if the Project Team is not fully integrated yet. The Project Team has also set values, such as integrity, openness etc.
 - #2P argues that the Project Charter does have an indirect influence through the three people who signed it, because these people are quite influential in their organizations and people on site are going to react more to those individual's ways of working rather than to the Project Charter. Further, #2P states that reasonable behaviour is not something you can write down in a manual.
 - #5C states that the Project Charter does have an influence on how you set up and organize the management team, because you will try to put people in place who want and are capable to work in accordance to that Project Charter.
 - #3P states that there is still that rift between the Designer and the Contractor and sometimes they can get a bit heated with their roles, for example, #2P mentions that there was a major disagreement early on the project. However, by large, all parties try to get along and to work as a team, because the parties have to work together and trust each other to do what they should, and writing down how people should behave in the Project Charter does not make any difference in it.
 - #4I and #6C state that the parties are working according to those objectives, but it is more an inherent thing that happens rather than because it is written down in the Project Charter. #6C argues that 9/10 times the parties behave properly. #4I mentions that most people on this project care about the people around them, therefore it is a challenge to take appropriate action when someone behaves poorly.

(3) Objectives

Main findings:

- A. The MFA's mission statement and project objectives are included in the Project Management Plan (The Moray Council, 2013, p. 7). The Mission Statement is 'to deliver flood alleviation for the communities in Moray as soon as possible' and the stated objectives are 'to have no major accidents or incidents, to have a satisfied client and community, to deliver effective flood alleviation as soon as possible, to make most effective use of the team's resources, to develop demonstrably sustainable solutions, and to ensure that the project is commercially viable for all partners'. In addition, a Charter was signed with regard to Health, Safety and Environment. Project objectives were aligned with regard to the project results, the procedures and the relationship.
- 6/6 interviewees state that so far, the Employer, the Project Manager and the Contractor have complied with these project objectives.
 - 4/6 interviewees (#1E, #3P, #5C and #6C) argue that those objectives are achieved by working together and solving problems as a team, rather than to finding out who is to blame and is going to pay for it. #6C states that it helps that there is a consistency of people on the projects since 2002, so there are many people who understand those core values of the early stages. #1E mentions that it helps that the parties are working together on several projects so that the costs of any project problems are very low compared to the overall flood programme costs of 170 million pounds and are not really worth arguing about, and that one of the goals is to make the projects commercially successful for all parties.
 - 3/6 interviewees (#2P, #4I and #6C) argue that the project objectives were derived from the previous flood schemes, which also implies that only achievable and realistic ones were stated. #2P mentions that the flood programme objectives have been reviewed over a fifteen-year period since it is not possible to set flood programme objectives which remain relevant all the way through for fifteen years. Therefore, the flood programme objectives were adapted for each project to what was relevant at that time. #4I mentions that the Elgin PMP was used as a basis to draw up the PMP for this project.
- B. According to the Contract Documentation, Option M (X15) is included in the Contract which limits the Contractor's liability for his design to reasonable skill and care. In other words, the design does not have to be on the basis of fitness for purpose.
- 4/6 interviewees (#1E, #2P, #5C and #6C) know why Option M was chosen and argue that RHDHV is the main designer, so they have to deliver a design which is 'fit for purpose' and are liable for the design if something goes wrong. However, there was Early Contractor Involvement (ECI) and the Contractor does have some design work (about 10-15% of the overall design), but it was felt unreasonable that the Contractor should have a higher standard of care than the Designer does and the Contractor was quite reluctant to take on design responsibility for anything. According to the Contractor's team, 'fitness for purpose' is usually quite

an onerous thing to achieve and it is not possible to ensure the works against it, whereas 'reasonable skill and care' is a much more realistic objective to achieve. The insurance part is in line with what (Barlow, 2011, pp. 6-7; Downing et al., 2013, p. 451) states. Further, the Contractor did not want to be liable for the whole design but only for his design element, because he cannot influence the design entirely. In some cases, the design work of the Designer and the Contractor overlap, which makes it difficult to define who is liable for something and 'fitness for purpose' makes it even more complicated.

(4) Communication (system)

Main findings:

- A. In the Project Management Plan (The Moray Council, 2013, pp. 18-24), plans were drawn up for communication and information between the Employer and the Contractor during the project. These include the templates, the circulation of correspondence, the meeting schedule, and the progress reports.
 - 5/6 interviewees (#2P, #3P, #4I, #5C, and #6C) are directly involved in the communication processes and state that so far, the Employer, the Project Manager and the Contractor have complied with the communication and information plans stated in the Project Management Plan and that these plans work quite well. It is important to keep reminding people to stick to the standard forms and the processes set out in the plans though.
 - #3P also mentions that the standard forms have been developed to make them more efficient since the Rothies scheme and some new forms were added (e.g. the Request For Information) to solve common problems.
- B. The Employer's and the Project Manager's team use Box (digital Document Management System), but it appears that the Contractor does not have access to this as well. It is not clear from the project records as to whether the Employer and the Contractor share another DMS for the purpose of information exchange.
 - #3P and #4I confirm that Box is not shared with the Contractor and that they do not share another DMS. The Contractor does keep the hardcopies of the files on Box.
- C. Communication is also covered in NEC2 ECC in clause 13. Pursuant to this clause and the Contract Documentation (The Moray Council, 2012), communication must be in a form which can be read, copied and recorded, writing must be in English, the period of reply is two weeks, and a notification must be communicated separately. In addition, this clause sets out rules for replying to communication and the issuing of certificates.
 - 6/6 participants state that the Employer, the Project Manager and the Contractor have complied with clause 13 regarding communication in the NEC2 ECC up to now, except for the period of reply since it is difficult to reply everything within two weeks (about 20% of the formal communication cannot be replied on time) due to, for example, planning, consultations (e.g. request for a design change or a technical query due to an error between the specifications and the bill of quantities), high workloads and limited resources. The Project Manager identified this problem early on, and 4/6 participants (#2P, #4I, #5C and #6C) mention that all parties agreed that it is more relevant to recognize the importance of communications rather than the importance of the period of reply. Therefore, the parties prioritize the importance of communications, which depends on when the party needs the information before it starts affecting the works and the amount of work that needs to be done in order to reply. So the period of reply may be different for every document. This method also has its flaws, because #3P argues that the Contractor sometimes gives you much less than two weeks to reply.
 - #6C argues that the NEC2 ECC is a little bit open-ended in terms of the period of reply since the time-bar does not include a sanction, but also that the deemed acceptance in the NEC3 is against the good faith and the mutual trust and co-operation elements.
 - #3P also mentions that the communication method is sometimes not in writing, but verbally.
- D. Communication according to the NEC2 ECC and the Project Management Plan seems to be a lot of administrative work for the parties.
 - 6/6 interviewees indeed state that it is a lot of administrative work, but it is still manageable. The former is in line with what (Rowlinson, 2011, pp. 38-40) and (Heaphy, 2012, p. 29) state.
 - #1E, #2P and #6C argue that it is important to tightly manage the administration, otherwise the NEC contract does not work at its best.
 - #3P and #6C argues that it is also important to create an extensive audit trail, since the Employer might need it someday. The audit trail helps the Employer to understand why things are the way they are. #3P states that some projects are better than others in record keeping, but this project and the Elgin project are quite good regarding this aspect.
 - #2P, #5C and #6 argue that it helps that there are contract administrators who centrally control all formal communications by means of the project registers.
 - #1E states that it helps that a fourth party (EC Harris) involved to do some of the administrative work.

(9) Communication (repeated fulfilment)

Main findings:

- E. The contract documents did not lay down requirements regarding informal communication on the parties.
 - According to the interviewees, the Employer, the Project Manager and the Contractor have informal contact with each other on a day-to-day basis by means of the co-location, which was a deliberate choice by the Employer. The project team members have quite relaxed informal face-to-face contact (instead of email) to clarify points, drawings etc. or to discuss and solve problems prior to sending the formal documents. Further, there is informal contact by telephone and before and after the formal meetings.
 - The Employer is located elsewhere, but #1E argues that the Project Manager is the Employer's representative in the office.

(5) Problem solving (philosophy)

Main findings:

- A. Clauses 60-65 in the NEC2 ECC deals with claims from the Contractor in the form of Compensation Events. The Project Manager plays an important role in the CE procedure. Pursuant to clauses 90-93 (W1&W2) and Y(UK)2, disputes may be referred to the Adjudicator, who was appointed prior to the start of the project. If the dispute is still not resolved, it may be referred to the tribunal, which according to the Contract Documentation is arbitration, unless both parties agree to litigation in the high courts.
 - 5/6 interviewees (#1E, #2P, #4I, #5C and #6C) are directly involved in the CE processes.

- 6/6 interviewees argues that so far, the Employer, the Project Manager and the Contractor have complied with clauses 60-65 regarding Compensation Events (CE) in the NEC2 ECC. The dispute resolution clauses (90-93 and Y(UK)2) have not been applied yet, since there have been no disputes.
 - 4/6 (#1E, #4I, #5C, and #6C) state that there have been a lot of CEs due to all the changes which took place on site (e.g. not closed out planning conditions and value engineering ideas) and quite some new risks (e.g. different ground conditions than expected), but they are still manageable, except for the period of reply due to high workloads and limited resources (e.g. a great number of CEs in a certain period). The many CEs and the heavy administrative burden is in line with what (Ennis, 2010, p. 8) state.
 - #5C and #6C state that none of the CEs was contentious, but all were easily discussed and agreed. #3P mentions that EC Harris deals with all the financial stuff and check the CEs and so far, they only had comments about what is happening on site and the actual amount of work of the CEs performed by the Contractor.
- B. The Project Manager plays an important role in the CE procedure. In literature, the Project Manager's dual role (i.e. as the Employer's agent and as a certifier) is the subject of many discussions. Cost consultant EC Harris is involved in the project to provide independent pre-construction cost estimates and benchmarking of target price and programme, to manage financial aspects of construction contracts and to certify that the costs meet the Council's statutory duty in regard to Best Value, value for money and probity (The Moray Council, 2007).
- 5/6 interviewees (#1E, #2P, #4I, #5C and #6C) are directly involved in the CE processes.
 - #1E and #2P argue that the NEC2 ECC does not ask the Project Manager to conduct the CE quotation impartially, but it does say that the Project Manager has to act in the Employer's interest.
 - 4/6 interviewees (#1E, #4I, #5C and #6C) state that on this project, the Project Manager is impartial and fair, which is in line with what the Employer expects from her. The Contractor's team (#5C and #6C) argue that the Project Manager's impartiality is key on NEC projects.
 - #2P (the Project Manager) argues that besides being the Employer's agent, she is also part of a team with the goal of delivering this project within time and budget. She further states that she has been quite lucky in as far as there has been enough scope within the budget and the programme, therefore she have not had to say 'no' to things which needed to be done to achieve the project objectives.
 - #1E and #3P argue that it helps that there is a Cost Consultant (EC Harris) who involved draws up the quotation and discusses it with the Contractor. The Cost Consultant is also paid by the Employer, but is independent from the Designer and the Contractor. The Employer expects the Cost Consultant to act fairly. The Project Manager acts on the advice of the Cost Consultant and has to sign of the quotation.
- C. In general, claims from the Contractor may have an influence on the trust level between the Employer, the Engineer and the Contractor.
- 6/6 interviewees state that on this project, the CEs do not have an influence on the trust level between the Employer and the Contractor. There are several reason for that.
 - 4/6 interviewees (#1E, #3P, #5C and #6C) argue that there have not been any unexpected claims. #6C also states that it is up to the Project Manager to straighten the Contractor's position in case of different views. #1E mentions that all unreasonable CEs will be challenged openly by the Cost Consultant and that partnering is not about being buddies or friends. The latter does not mean that people should not become buddies or friends, but it implies that it is not a project goal in itself. Being friends can become a problem because people need to challenge each other. You have to be able to be open and say what you think. Our Project Team has been together for a long time, so they know each other and trust each other. Therefore they can challenge each other and the receiver would not be offended.
 - #5C and #6C state that CEs usually do have an influence on the trust level between the Employer and the Contractor because of the whole claim mindset of contractors, but on this project both parties behave quite well. #5C argues that the Contractor's team works for a commercial company and focuses on what is best for the company, but if the Contractor loses sight of being fair and just focuses on making profit, it is very easy to lose the Employer's trust and the Contractor is more likely to end up in a dispute with the Employer. In order to maintain the trust between the parties, it is important that Employer is impartial and that the Contractor is reasonable and fair to what the Employer asks. It takes a while to get to the point where both parties act like this. Most people have to struggle with this, as they come from a different background in which it is a kind of natural thing to try to get something extra, and for the Employer it is quite natural to think that the Contractor is going to do that. #6C argues that the parties manage the project well enough in order to understand that they are comfortable with how things are going. Therefore, there is not that contractual drive for the Contractor to make more money and that contractual drive for the Employer to keep the budget tight.
 - #2P and #6C argue that the pain/gain share mechanism has more influence on how CEs are viewed and on the trust level and that the parties are now in a 'gain' situation due to negative CEs.
 - #3P states that it is not really beneficial to the Contractor to withhold information in order to issue a big claim because of the pain/gain share mechanism.
 - #4I argues that the NEC2 ECC is set up as an open book contract, so all parties can check the Contractor's cost data, which creates trust in what the Contractor is submitting. #4I further states that the Contractor produces daily and weekly record sheets, which are checked and signed off by the Employer's Site Supervisor. So the CEs are checked on a couple of levels.
- D. The contract documents do not lay down requirements regarding problem-solving by amicable agreement.
- According to the interviewees, the parties do the following to resolve problems by amicable agreement: talking (to understand the details of the problem and the parties' interests), informal discussion prior to sending the formal documents, challenge each other, collaboration and mutual help to find the best solution (i.e. fit for purpose, cost effective and takes into account the total impact of the problem), set a common objective, informal early warning, formal early warning for severe problems, early warning meeting, and monthly progress meeting (platform to solve problems).
 - #3P argues that problem-solving also depends on the people. On the one hand, if you have the right people working together to deal with stuff, there will be no problem to solve things amicably. On the other hand, if you have obstructive people with a wrong agenda, the problems will be much more difficult to resolve. #1E states that any problems which are relationship-based have to be spotted early on and intervened.

(10) Problem solving (effectiveness)

Main findings:

- E. All problems seem to have been resolved by amicable agreement up to now.
 - o 6/6 interviewees state that so far, all problems were resolved by amicable agreement within the Project Team (i.e. the first two levels). The escalation model is as follows site team > management team > Moray Flood Alleviation Strategic Steering Group. Only a few things were escalated to the highest level to give them a warning and an update about it.

(6) Risk allocation

Main findings:

- A. According to the Project Management Plan (The Moray Council, 2013, pp. 6-7), the Employer and the Contractor organized a risk workshop together to identify and to evaluate contract risks, to apportion risk responsibility and ownership, and to quantify defined and overall risk costs. Clause Z11 in the Contract Documentation adds a risk allocation table to clause 81.1 (and 80.1) in the NEC2 ECC (The Moray Council, 2012). This table was developed jointly between the Employer and the Contractor during the risk workshop and contains both Employer's and Contractor's risks specific to this project. According to the NEC2 ECC, risks which are not carried by the Employer are carried by the Contractor.
 - o #1E mentions that the risk allocation table was added in order to tailor the risk allocation specific to the project, but that does not mean that there are no disputes about whose risk it was, but the parties have not had many.
 - o 6/6 interviewees state that the risk allocation between the Employer and the Contractor in the contract is clear and works quite well. There are several reasons for that.
 - o 6/6 interviewees argue that clarity is created by means of the monthly risk review meetings. All parties (the Employer, the Project Manager, the Contractor, the Designer and the Cost Consultant) attend these meetings to review the risk allocation, to discuss all risks and to reduce the number of risks as time goes on.
 - o #5C also states that the Contractor was involved in the risk workshop in which both the Employer's and Contractor's risks were clarified and discussed extensively, and suggestions and comments were made. The risk workshop worked really well and resulted in a risk allocation with which both parties are comfortable. The risk workshop gave the Contractor a lot of opportunity and time to work on the risks and gave the Employer a clear risk allocation with which he was better able to budget the project and to monitor the overall costs.
 - o #6C also states that there was Early Contractor Involvement on all projects, which increased the understanding of the risks.
 - o 6/6 interviewees state that as a result of the risk workshop, risks are allocated to the party best able to manage them.
 - o #1E gives some examples of the latter. The Employer takes the fuel price risk for the Elgin project, but the Contractor takes that one for the Forres project, simply because Forres is much shorter of duration. The fuel price is more uncertain over a longer period and puts limits on what the Contractor can do. The same was done for the steel price risk, the Contractor took the risk for the Forres project as it is a shorter contract and less steel was needed on that project. If the risks are allocated inappropriately, it is not very cost-effective because the Contractor cannot manage every risk and to ask him to do anyway, then he can only price them quite conservatively usually. For example, the Employer could have asked the Contractor to take the fuel risk on a four-year contract for the Elgin scheme, but the Contractor can only have managed that by inflating his price because you cannot predict the fuel price in four years from now. The Forres scheme was only a two-year contract and most of the fuel would be needed early, so the Contractor could take that risk and he did.
 - o #5C states that there are always risks which could be allocated to either party. On this project, it was decided to include a threshold for such risks.
 - o #6C argues that both parties have quite some experience, therefore there was a quick consensus on the risk allocation. So there will be a general understanding about what a fair risk allocation is (e.g. regarding the threshold of the flood event risk) and what can be expected from a party who carries the risk, which makes the process easier to manage.
- B. According to the Contract Documentation (The Moray Council, 2012), Option C was chosen, which means that the Employer and the Contractor share the financial risk by means of a pain/gain share mechanism.
 - o 5/6 interviewees (#1E, #2P, #4I, #5C and #6C) know why Option C was chosen instead of the other main options.
 - o 4/6 interviewees (#1E, #2P, #4I, #6C) argue that Option C promotes the partnership (e.g. align objectives and culture of trust, co-operation and working together) in order to reduce the costs for everyone. The pain/gain share mechanism creates an ethos where you really need to work closely together to achieve the common objectives so that you could save on the programme and costs in order to create a gain share. The Employer wanted a contract where there would be an advantage to the Contractor to be innovative and efficient, so that both parties could gain from that.
 - o #1E and #4I mention that the use of Option C was derived from previous flood schemes. #1E stresses that the pain/gain share mechanism was not applied on the Rothes scheme because the Contractor's risk allowance was too high due to many uncertainties on the project.
 - o #1E stresses that Option C also has its risks. The Employer understood the risk of CEs pushing up the target cost and the risk that if the Contractor is involved in the design phase, he would have a temptation to hold back innovations to later in the project. The parties dealt with these risks by discussing them, by saying just be open and by saying that the Employer is aware of the possibility that it could happen, but that the Employer wants to trust the Contractor that the best ideas get out and are included in the target costs, so that the target cost is kept down.
 - o #5C states that when the contract and the target price was agreed, there were still some elements not fully designed, some consultations not completed, and some of the planning conditions were not signed off. So some elements were not black and white, but it was necessary to start the project anyway because of the funding. Option C is quite flexible as the target cost allows for CEs to increase the target cost in order to accommodate such expected changes. Lump sum is not good if you expect changes. Cost plus is not good for the Employer as the final cost is not known until the project is finished. Option C seemed to be the best option for both parties. #1E indeed confirms that the design was not final at target cost setting, but #6C states that the design was quite advanced, quite comfortable and looked holdable at the end of the day to price it right.
- C. In theory, the pain/gain mechanism may create an incentive for the Contractor to issue a lot of CEs to increase the target cost.

- 6/6 interviewees state that in theory, the pain/gain mechanism does create an incentive for the Contractor to issue a lot of CEs to increase the target cost, but in practice, it comes down to trust that the Contractor does not exploit this flaw in the contract. On this project, the Contractor refrains himself from such opportunistic behaviour, there are several reasons for doing so.
- The Contractor's team (#5C and #6C) argue that acting like that will seriously affect the relationship with the Employer. #5C further argues that besides the common project objectives, the parties also have other common objectives, which are the next flood scheme and the maintenance of the relationship. All flood schemes are CEs (i.e. the projects were not awarded all at once), which creates an incentive for the Contractor to perform well.
- #2P and #5C argue that on this project, there is more reduced work than additional work (mainly as a result of unexpected gains (better quality of released materials for re-use and better weather conditions resulting in lower river levels) and value engineering (e.g. the grout curtain)), which puts the parties in a 'gain' situation. #2 says that the 'gain' situation allows more freedom for the parties to be a bit more forgiving, which promotes the development of trust.
- #2P also states that it helps that the target price was negotiated and was quite generous. It was independently audited to check if it is value for money though. #3P adds to this that most things are already included in the target price, so there is not much left to claim.
- #4I argues that the target cost and CEs are closely monitored by the Employer's team.
- #1E states that CEs are only issued for things which have to happen and CEs are purely for the works, which means that the programme implications are not taken into account. For example, it is okay if the Contractor says that he has to extend a wall with 100 meters, but it is not okay if he says that he has to extend the wall, but that it has an impact on the programme and other things, and before you know it this would mean a couple of weeks delay, because the delay would cause a major increase of the target cost due to, for example, extra costs for running the site (e.g. in Elgin it costs £50,000/week). The Employer decided to pay the programme implications through actual costs plus fee. This decision takes the programme implications out of contention, which has been very successful.
- D. Pursuant to the project records, the parties do not seem to share any other risks in terms of liability, besides the financial risk.
 - 5/6 interviewees (#1E, #2P, #4I, #5C and #6C) are directly involved in the risk management processes and state that the Employer and the Contractor do not share any other risks in terms of liability. #1E argues that the Employer wanted to take out anything what would help the Contractor to gain at the Employer's expense and vice versa, which is done by aligning the incentives in terms of sharing risks and rewards through the pain/gain share mechanism.
 - 4/6 interviewees (#1E, #4I, #5C and #6C) mention that the flood event risk contains a cut-off, so it is not really shared but separated. If it is a flood event up to 1 in 10 years, it is a Contractor's risk. Beyond that, it is an Employer's risk and a CE. Early on, the parties have defined it as a level on a gauge what a flood event of 1 in 10 years is, so there can be no disputes about that.
- E. According to the project records, the Contractor's risks are included as a risk allowance in the target price and any savings on this allowance will be shared between the Employer and the Contractor by means of the pain/gain share mechanism.
 - 5/6 interviewees (#1E, #2P, #4I, #5C and #6C) are directly involved in the risk management processes and state that the Contractor's risks are included as a risk allowance in the target price. Any cost savings (e.g. due to good risk management or if the risks do not materialize) and any cost overruns (e.g. due to underestimated prices) regarding the risk allowance are shared 50/50 with the Employer through the pain/gain share mechanism.
 - #6C further argues that if the Employer's risk allowance is not used, the budget savings will be for the Employer and that the parties have an understanding that if the risk allowances are needed to be used, they should be used.
 - #1E, #5C and #6C state that new unforeseen risks are Employer's risks and are included in the Employer's risk allowance. If the Employer's risks (including unforeseen risks) materialize, they will become CEs. The number of new unforeseen risks is limited.
 - #2P and #6C state that new construction risks (e.g. quantification risk) are carried by the Contractor.

(7) Continuous improvement (system)

Main findings:

- A. There is nothing in the project records regarding a system or measures for the purpose of improving the relationship between the parties during the project.
 - 6/6 interviewees state that there is no system or measures for the purpose of improving the relationship between the parties during the project, but #2 does argue that the Employer and the Contractor did agree on co-location for the purpose of improving their relationship during the project. Co-location helps as there are joint facilities (e.g. the canteen) where people do chat over coffee and lunch.
 - 4/6 interviewees (#3P, #4I, #5C, and #6C) argue that the relationship improves informally on a day-to-day basis e.g. during lunch and coffee breaks.
 - #1E, #5C, and #6C argues that measures were not needed, because the relationship between the parties is good. #1E states that you have to be careful about these things, because these kind of behavioural workshops are good when you need them. If you have a team building workshop when the team is already working well, it is like taking children back to school and it is almost patronizing to say that we are going to have a team building workshop. The team may even be insulted by having it.
 - #5C further states that it helps that during the weekly Contractor's meetings, he keeps reminding the team that they have to work with the Employer's team as a one team rather than as separate entities. For example, by encouraging them to be as positive as possible towards the Employer's staff and to try to work better together.

(11) Continuous improvement (emotional investments)

Main findings:

- B. According to the Project Start Up Meeting Report, an initial team-building event took place in the form of a joint lunch. Besides this fact, nothing else was found with regard to this aspect in the project records.
 - 6/6 interviewees state that there were no formal meetings or workshops for the purpose of improving the relationship between the Employer and the Contractor.
 - 4/6 interviewees (#3P, #4I, #5C, and #6C) argue that the relationship improves informally on a day-to-day basis e.g. during lunch and coffee breaks.

- 4/6 interviewees (#1E, #2P, #3P and #5C) mention that there were also some informal events such as an initial joint lunch and a Halloween lunch.
- #4I and #6C argue that the lessons learned workshops from the previous flood schemes also covered the aspect of improving the relationship between the parties.
- #2P stresses that the evidence of emotional investments in the project is that there are people who have been involved all the way through, which implies that they actually care about the projects.

(x) Other trust components

- A. Other components which are relevant for building and sustaining trust between the Employer and the Contractor on this project are:
- #2E: The past co-operations on the previous flood schemes have helped helps in terms of understanding the systems of the other parties, but on each project it still comes down to the individuals involved. Although there are people who turn up time and time again, the composition of the team on each project is somewhat better or worse than on other projects.
 - #4I: The past co-operations on the previous flood schemes have helped the parties to get to the level of trust at the moment.
 - #3P, #5C and #6C: Consistency of the organizations and their people helps to deliver the schemes, to build relationships and to create a working culture together. Long-term employees think further ahead and tend to behave better as they are staying around. The working culture passes on to the many new people coming in. The Project Team is different on each project.
 - #1E: Allow the team to act as a team. This is important because of the long-term nature of the flood programme. The parties have to show the public that they all have the same identity. The parties use the MFA as a badge.
 - #1E: Present yourself as a team at the public Council's Committee meeting. The representatives of all four parties of each project gathered to face the Councillors and take their questions, which was quite innovative as normally it would only be Council's Officers. This approach was very successful because the Councillors, the public and the press got to know the Project Teams. Unfortunately, two years ago, TMC got a new director who did not allow this anymore.
 - #1E: Corporate social responsibility. The parties communicated directly with Councillors and have helped out massively when there were emergencies, for example, flood events and snow events.
 - #1E: Lower barriers for communication with the Councilors, which was only possible because of the long-term nature of the flood programme and the low turnover in staff of all parties. It helps if the Councilors know and talk to the Project Team, because the Councilors can be very suspicious and might think that the parties are paid too much since they work for a commercial company are only in it to make profit. The latter may be true, but this does not mean that the parties do not provide value to the Council.
 - #1E: Lessons learned from the previous flood schemes. The lessons learned workshops have been tight team building events as well because of the geographical dispersion of the parties. What the parties also did was, for example, for the Rothes lessons learned the parties brought in the Forres design team so that they could hear first-hand the things which had gone well or badly and the way things could have been done better. The lessons learned have also been valuable for changing the contract style and evolving the contract.
 - #1E: Consistency of costs. All costs were based on the Contractor's costs all the way through, which is valuable because these estimates are more accurate than the Employer's and any changes can be explained more easily.

Remarks on existing components:

- #2E mentions that all systems or processes are important and exist on the project.
- #3P mentions an addition to 'joint goal setting': aim at winning an award. On one of the schemes, the parties were really aiming at winning an award. It was something that all parties were hoping for and wanted to achieve, so that really had influence on how they steered the project.
- #3P mentions an addition to 'system for continuous improvement of the relationship': lessons learned workshops, but the lessons learned need to be communicated well. One time the parties noticed that they had learned the same lesson again, which is not good.
- #1E mentions that essential in first instances in a project is client leadership, because everything else flows from it. It took the Project Director about 18 months to convince The Moray Council to let go of their very traditional and very adversarial approach as they were not familiar with the concept of a framework. Their big fear was that they were letting a contract for an uncertain amount of money because the parties were not going for a predictable defined cost very early on in the project, and the auditability of the system was also a point of discussion since they wanted to know how they could proof that they got the cheapest. The former can be controlled by only spending what you have by instructing work through the contract, and the latter can be proven by means of quality assessments. The collaborative approach is working, because the projects are broadly on time or ahead and are all under budget.
- #1E mentions that the NEC contract is not that fundamental. It has a facilitating influence, but not a driving influence. The driving influence comes from the concept. The parties could have run the project on a different standard form of contract provided they adapted the behaviours. As long as you are going to take people and work reasonably, you can make any contract work. The NEC does point you into the right direction, but you have to be wanting to go there because there are also NEC projects which go wrong as well (e.g. the Edinburgh flood scheme) probably due to the wrong main option, procurement and relationships.

31.3 Overview of trust building aspects on the project

Table 110: Overview of trust building aspects on project Forres

Building trust (score 3-4)
(x) Client leadership in promoting the collaborative approach
<i>*(1+2) Best value procurement, European tender</i>
<i>*(1+2) The Employer was looking for local representation and a Contractor with long-term employees and wanted to meet the project implementation team rather than the marketing team</i>
<i>*(1+2) Multiple selection and award criteria from long-term perspective. The organizational culture, the competences and the benevolence were paramount.</i>
(1+6) Negotiated contract
(3+6) Focus on the target in terms of the costs and programme mainly due to the pain/gain share mechanism
<i>*(3) WIN for all parties on the project and in the long term</i>
<i>*(3+6) Other common objectives: partnering over a 15-year period (maintenance of the relationship) and working together on the next flood scheme (all flood schemes are CEs, which promotes good performance)</i>
<i>(3) The Project Team is delivering the project within time and budget</i>
<i>*(3) Achievable and realistic mutual project objectives derived from the mutual objectives in the long term</i>
(3) The Contractor's standard of care is limited to reasonable skill and care due to E&C contract
<i>*(4) Clear and extensive communication system</i>
<i>*(4) Extensive use of standard forms and project registers</i>
<i>(5+9) Informal discussion and agreement prior to sending the formal documents</i>
<i>(5+x) Working together and solving problems as a team and challenge each other to achieve the common project objectives</i>
<i>*(5+6) Open book regarding the Contractor's cost data</i>
<i>*(5) The Project Manager can act impartial and fair by means of help from the Independent Cost Consultant, as he draws up the quotation for CEs</i>
<i>*(5+8) No unexpected or contentious claims, there is not that contractual drive for the Contractor to make more money and for the Employer to keep the budget tight.</i>
<i>*(5+6) CEs are purely for the works, which takes the programme implications out of contention</i>
<i>*(5) Formal and informal early warning meetings</i>
<i>*(5) Mutual formal and informal early warnings</i>
<i>(5) Clear, extensive and streamlined CEs procedure</i>
<i>(6) Joint risk workshop to tailor the risk register specific to the project and to allocate the risks to the party best able to manage them. The Employer's risk allowance covers unforeseen risks.</i>
<i>(6) Clear risk allocation</i>
<i>(6) The Contractor's risk allowance was negotiated and is part of the pain/gain share mechanism</i>
<i>*(6) The financial risk is shared by means of a pain/gain share mechanism, which promotes the partnership and encourages the Contractor to be innovative and efficient in order to create a 'gain' for all parties</i>
<i>(5) The pain/gain share mechanism has influence on how CEs are viewed. A 'gain' situation allows more freedom for the parties to be a bit more forgiving.</i>
<i>(6) The parties are in a 'gain' situation due to negative CEs as a result of unexpected gains and value engineering</i>
<i>(8) By large, all parties understand the meaning of good faith and act in good faith</i>
<i>(8+x) The Contractor has set up and organized his management team by checking if people are capable and willing to work in accordance with that 'spirit of mutual trust and co-operation'. It comes down to the individuals involved.</i>
<i>*(8+x) Past co-operations on the other flood schemes and previous joint lessons learned workshops</i>
<i>*(8+x) Continuity of staff in all parties</i>
<i>(8) The Project Manager may instruct the Contractor to replace an employee</i>
<i>*(9) A lot of informal contact on a day-to-day basis by means of the fulltime co-location</i>
<i>(10) All problems were resolved by amicable agreement within the Project Team</i>
<i>(10) The Adjudicator was appointed prior to the start of the project</i>
<i>(x) Corporate social responsibility and the way the Project Team deals with the Council.</i>
Could be done better to build trust (score 2-2.5)
<i>(3+8) The Project Charter only has an indirect influence through the people who signed it</i>
<i>(3) The works were not fully designed at the time of target setting</i>
<i>(4) The DMS (Box) is not shared with the Contractor</i>
<i>(4/5) Communication (e.g. for CEs) according to the NEC2 ECC creates an extensive audit trail, but it increases the administrative burden for all parties, therefore the period of reply is not always met. There is no sanction either.</i>
<i>(7+11+x) The relationship improves informally on a day-to-day basis by means of the co-location and social events. There are also formal joint lessons learned workshops, but these are not held during the project.</i>
<i>(8) Good faith in Scots law only has an indirect influence on the behaviours through culture</i>
<i>(8) Mutual trust and co-operation clause in the NEC2 ECC is not effective in itself, but forms a good basis for building trust. The intention of the clause is clear, but it remains open to interpretation and cannot be enforced</i>
Building distrust (score 1-1.5)
-

BOLD = (Related to) condition of contract, ITALIC = Amendment to contract, GREY = Important aspect, * = Influenced by the strategic partnering

31.4 Assessment of change management in the project

Table 111: Assessment model for change management on project Forres

Objective	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)	
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	3
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	3
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	3
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	3.5
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	2
			(6) Update shared databases and incorporate lessons learned for project and organization	4	2
	Recognize change	Change management process	(7) Early identification of potential changes	4	3
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	3
			(9) Document the proposed change in a log	3	3
	Evaluate change		(10) Determine priority of the change	3	2
			(11) Selection of optimum change options by consulting all relevant parties	3	2.5
			(12) Identify the likely impacts of different change options	3	2.5
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	2.5
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	3
			(15) Appropriate documentation to record all decisions within the change process	3	3
	Monitor implementation		(16) Monitor and record implementation	3	3
TOTAL LEVEL OF CHANGE MANAGEMENT			3.19	2.75	

(1) Objectives

Main findings:

- A. Change management objectives were aligned between the Employer and the Contractor and are stated in the Project Management Plan (The Moray Council, 2013, p. 7). These objectives are: 'Design changes after target cost setting kept to a minimum other than to accommodate exceptional or unforeseen events or cost saving opportunities' and 'Procedures in place to deal with early warning and change management'.
 - 5/6 interviewees (all, except #1E) are directly involved in the change management processes.
 - #2P and #3P state that the objectives were derived from the lessons learned from the previous flood schemes. There was Early Contractor Involvement during the design phase. One person from the Contractor's team joined the designers to make decisions about how things are going to be built. A problem on the previous projects was that the Contractor's team involved in the construction phase had different ideas about certain construction methods, which resulted in a lot of design changes. These changes were not very well documented, so it was difficult to check why the changes happened or whether these were beneficial to the Employer. Therefore the objective 'Design changes after target cost setting kept to a minimum other than to accommodate exceptional or unforeseen events or cost saving opportunities' was stated in order to distinguish 'necessary' design changes due to things that are different on site from 'preferred' ones. The Employer is the only one who pays for the additional design work and the delay on site due to 'preferred' design changes. Such changes do not necessarily lead to cost savings. Therefore, since the Elgin project, the Project Team has been using a Change Management form, which allows for a business case to be put forward for making substantial design changes.
 - 2/6 interviewees (#2P and #6C) state that so far, the Employer, the Project Manager and the Contractor have complied with the change management objectives stated in the PMP.
 - 3/6 interviewees (#3P, #4I and #5C) state that the parties have not adhered to the objective 'design changes after target cost setting kept to a minimum other than to accommodate exceptional or unforeseen events or cost saving opportunities', because there have been many 'other' design changes and these have been recorded as CEs. First, the works were not fully designed yet at the time of the target price was agreed. There was a push to start the project anyway because of the funding. The sooner the project started, the sooner it will be finished and the sooner Forres will be protected against floods. The parties have handled the changes quite well, because these were expected. Everybody behaved the way they should and gave the designers time to catch up instead of making a big issue about it. Second, there have also been some small changes on the project, which are going to be beneficial to the Employer in the long-term.
- B. There is nothing in the project records with respect to risk management objectives.
 - 6/6 interviewees state that the Employer and the Contractor did align objectives with regard to risk management procedures. In the early stages, the parties agreed on the risk register, the regular risk review meetings and the joint reviewing of the risks.
 - 4/6 interviewees (#2P, #3P, #5C and #6C) state that the parties also aligned the objectives regarding the risk management results by means of the pain/gain share mechanism. This mechanism and the risk management procedures promote a proactive risk management approach in order to achieve the common project objectives.
 - #1E argues that the parties have a joint interest to make the outcome predictable since unpredictable outcomes affect the reputation of all parties.

- #3 further states that the Contractor wants to work with the TMC (the Employer) again at some point, so if the Contractor does not show that he is competent now, the likelihood of future work will reduce, and that since the contract is open book, the parties cannot have different goals because then you would be working against yourself all the time.

(3) Risk allocation

See trust criteria (6).

(4) Risk management

Main findings:

- A. According to the PMP (The Moray Council, 2013, pp. 6-7), the client risk register identifies risks, ownership of those risks and actions and will be maintained by the Project Manager. Risk review meetings are attended by the Project Team and are held to monitor risk mitigation actions, to identify opportunities, to plan for future risks, to record actions and to update the register and estimate costs. The risk review meeting seems to be similar to the 'early warning meeting' stated in clause 16.2 and 16.3 in the NEC2. The risk register was not yet included in the NEC2, but it is included in the NEC3 (clause 16.1).
 - #2P stresses that the NEC2 ECC contract is not clear regarding risk management, for example, on how to deal with disputes. Therefore, the Project Manager included risk management plans in the PMP and took the decision to separate out the risk management and early warning processes. These processes are more according to the NEC3, rather than the NEC2. The risk review meetings are general, administrative and regular meetings to update things, whereas the early warning meetings are only held if things are needed to change.
 - 6/6 interviewees state that so far, the Employer, the Project Manager and the Contractor have complied with the risk management plans stated in the PMP and in Clause 16 in the NEC2, and these plans work quite well. The risk review meetings are held every two months and all parties are involved. The Employer's risks are managed by the whole Project Team, whereas the Contractor manages his own risks. The risk review meetings are used to review the risks and to predict the costs to complete.
 - #6C states that at the moment, the Project Team is fairly comfortable with where it is going financially.
 - #1E stresses that it is really important that the parties manage the time and the costs of the projects due to their reputations. Their reputations have enhanced because the parties have been able to predict where they are going. It does not matter whether it is good or bad news, what matters is that the parties have detected it early and reported it.
- B. It is not clear from the project records how proactive the risk management approach of the parties is.
 - According to the interviewees state that the risk management approach by the Employer, the Project Manager and the Contractor during the project is largely proactive. #1E and #2P argue that it is not entirely proactive, because you cannot always predict what is going to happen.
 - 5/6 interviewees (#1E, #3P, #4I, #5C and #6C) argue that all parties attend the risk review meetings and therefore, everyone understands all project risks and understands what needs to be done to manage the Employer's risks together.
 - #2P stresses that the approach comes down to the personalities of the people leading the two teams. Both the Project Manager and the Contractor's Construction Manager (#5C) have a proactive approach and would rather know about a problem before it hits and try to mitigate it.
 - #5C argues that the focus is to turn risks into cost-saving opportunities, which will increase the gain for all parties.
 - 6/6 interviewees state that risk management does play a role in the change management procedure. There are several reasons for that.
 - #2P states that risks need to be reviewed constantly regarding the immediate future and the long-term future, which automatically links in to necessary changes and the management of changes.
 - #1E, #4I and #6C argue that if there is a risk and it materializes, then change management and a CE are required. If the risk is mitigated or reduced, then change management is not such a prevalent issue.
 - #3P and #5C argue that changes may have an influence on the risk probability or impact of other elements.
 - #3P, #5C and #6C argues that a risk mitigation measure may comprise a change, but it depends on the effect of the change whether it will be implemented or not. The effect of the change (i.e. the reduction of the risk) has to be bigger than the cost of the change. On this project, for example, the Contractor found a change when dealing with the risks of the grout curtain. The geotechnical conditions were unknown, so the grout could get into the river, which would affect the programme and the environment. Therefore the Contractor came up with a value engineering change (i.e. the piling solution) in order to mitigate the risks. The change took away the two big risks for the Contractor and also saved the Employer a lot of money, so it was a gain for both parties.
 - #6C argues that risk management is not used to identify areas where changes are likely to occur. If you spend your time looking at these, you take an eye of the objective. So if you are looking out at things which may arise, then you are not managing the project well.
 - #1E argues that if you want to manage the risks instead of just allowing more money, you have to use risk management to identify areas where changes are likely to occur. First, you should check the probability and impact to determine how much you can allow to go wrong. Second, you should check what you can do to manage it and to reduce the probability and impact. If changes are needed, you should make provisions for that.
 - #2P, #4I and #5C state that the link between the risk management and the Compensation Event clauses may not be clear in the NEC2, but the link between these aspects is clear on this project.

(2) Change management procedure (overall)

Main findings:

- A. According to the PMP (The Moray Council, 2013, pp. 26-27), the clauses 60-65 in the NEC2 ECC must be applied for dealing with change. These clauses describe the Compensation Event procedure. In addition, the PMP lays down two rules for change management: Changes can only be implemented by a Project Manager's instruction, and the Project Team may initiate a change by submitting a proposal, but a proposed change can only be implemented after the Project Director's approval and the Project Manager's instruction.
 - 3/6 interviewees (#2P, #3P and #4I) know why the two rules were added to the CE procedure and state that it was to create more control over changes by the Project Manager. #2P argues that more control is needed in order to avoid 'preferred' design changes

- and that the rules put in a second check by making the people who propose the change think about whether it generates benefits or not and whether it is necessary or preferable.
- 3/6 interviewees (#2P, #3P and #5C) mention that the two rules were derived from the lessons learned from the previous flood schemes.
- B. It is not clear from the project records as to whether the parties apply any of the variation clauses in the NEC2 ECC.
- #4I, #5C and #6C mention that the clauses 60-65 in the NEC2 ECC are clear regarding the roles and responsibilities and the type of changes, but not regarding to some processes. There are several things which are open to interpretation and could cause conflicts, but since it is the fifth scheme, such things have been aligned over time between the parties.
 - #2P, #3P and #4I mention that the parties have come up with a system on the basis of the variation clauses in the NEC2 ECC. The parties are working in accordance with the NEC2, but they never checked how closely the system matches with the NEC2. So it is not clear as to whether all sub clauses in 60-65 in the NEC2 ECC are applied in the change management procedure. #4I argues that the parties probably only apply the ones which are useable.
- C. The project records do not show whether the parties have adhered to the change management procedure which was agreed upon.
- 6/6 interviewees state that so far, the Employer, the Project Manager and the Contractor have complied with the change management procedure, except for the period of reply, but overall the system works well. #1E argues that on the Forres project, keeping up with the CEs, the quotations, the checks etc. has been the most onerous part of the procedure. That is why not looking into the programme implications in terms of costs for delay has reduced the amount of administrative work considerably and thus made the procedure more efficient.
 - #4I and #5C mention that the NEC contract is more formal and rigid than most other contracts, and requires a lot of paperwork.
- D. Project registers are maintained by the Contractor which is a log to record CEs, EWs, Notifications etc. The project records do not show whether the parties have made any other improvements to the change management procedure.
- 5/6 interviewees state that the project register is a management tool to manage the flow of paperwork as the NEC procedures requires a lot of it. The project registers are kept in order to make it easier for all parties to record where we are, to keep track of the information exchange, to keep track of the CEs and to manage the CEs, and they allow the register keeper to make sure that the right documents are forwarded to the right persons.
 - #6C argues that it is important to track the CEs on the project registers as each one carries a value which may affect the target cost. The registers give you a picture of where things are in terms of the financial position and the programme position.
 - #3P and #6C argue that the project register is one of the most useful things on the project. #6C further mentions that the parties used it on every flood project, therefore, people are pretty much used to working with it.
 - #2P mentions that the Contractor's registers are used because these were already existing since these are part of the Contractor's quality assurance system. In addition, for the Contractor's team it is easier because they do not have to deal with another project register which is produced by another party.
 - #4I mentions that the change management procedure has been improved and streamlined over the course of the previous flood schemes, but it is still in line with the NEC2 ECC clauses.
 - #5C states that the clarity of the standard forms (e.g. the boxes and the formats) and the project register (e.g. highlights when no reply yet) have been improved during the project.
 - #6C mentions the provisional allowance for certain design elements as another improvement made to the change management procedure, which is something that is not dealt with in the NEC. At the time of target cost setting, the Contractor was not fully comfortable with the design of certain elements and with putting a price against them. Therefore, a provisional amount of money was put against it. Once the design is fixed, this amount will drop from the target cost and will be replaced by the actual figure. Instead of rigidly following the change management procedure of the contract, this is another way to manage changes and requires trust of both parties to put a figure in there first and to manage change thereafter. It allowed a bit more workability between the two parties and it also allows a bit more engagement in terms of design development and collaboration together to come up with solutions that supersede the provisional allowance.

(7) Change management procedure (early identification)

Main findings:

- E. According to clause 16.1 in the NEC2 ECC, the Contractor and the Project Manager must give an Early Warning by notifying the other as soon as either becomes aware of any matter which could increase the total of the Prices, delay Completion or impair the performance of the works in use.
- 1/6 interviewees (#2E) states that the Early Warning obligation stated in clause 16.1 in the NEC2 ECC does not play a role in the change management procedure, because the Project Manager took the decision in the early stages that the parties were not going to follow that clause, but this is not documented anywhere. The Project Manager did not want to be swamped with EWs telling her things she already knew. If the Project Manager issues an instruction, she already know it is going to have a cost impact, otherwise she would not have issued it. So she does not want an immediate reply from the Contractor in the form of an EW saying it will affect the costs. Following this clause would lead to hundreds of EWs and it will affect the Project Manager's focus on the important things.
 - 5/6 interviewees (#1E, #3P, #4I, #5C and #6C) state that the Early Warning obligation stated in clause 16.1 in the NEC2 ECC does play a role in the change management procedure.
 - #4I, #5C and #6C argues that the EW instigates the parties to have a meeting to discuss what the problem is and how to deal with it, and if the risk cannot be mitigated, you can use the risk allowance. On this project, such EW meetings are usually informal. #5C argues formal EW meetings are often not needed because the parties highlight the changes and the circumstances which need to be addressed regularly and mostly the parties are able to agree to an action and to a CE since most solutions are obvious.
 - #2P and #3P argues that the EW can be abused by the Contractor, which is in line with what (Rowlinson, 2011, pp. 42-44) states. The sanction in the contract which states that the Contractor loses his entitlement on a CE unless he raised an EW is not helpful because then the Contractor will issue an EW for every single little thing. There will be so many EWs that the EW loses its effect and that the Project Manager cannot distinguish the ones for severe problems from the ones which are purely for administration. Therefore on this project, the parties agreed to discuss matters first to decide whether it is an EW and whether it has an implication, and that an EW will only be issued for serious things, so if it meant that the parties need to get together and talk in order to continue how the parties wanted to.

- #6C argues that the EW is not the same as early identification of a change. The EW is related to something that is going to happen and you may be able to do something about it to prevent it from happening, whereas early identification related to something that might happen.
 - 6/6 interviewees argue that it is clear what is meant with the EW obligation in clause 16.1 in the NEC2 ECC. Some interviewees mention that the 'aware' part is open to interpretation.
 - #1E argues that you have to read the NEC in the spirit of things meaning what they would ordinarily mean. Everything has to be taken within the terms of reasonable and that is how the whole contract was intended.
 - #6C argues that the EW is a moral obligation which is closely related to trust. You must trust each other that you are actually going to raise an EW as soon as you become aware.
 - #3P argues that this part can be abused by the Contractor as he may give you an EW and at the same time tell you that he cannot work next week or even tomorrow. On this project, it is not like that. The EW is not a useful tool because it is a tool for the Contractor to beat people with.
 - #5C argues that you can be aware of a problem without being aware that it is actually going to affect the contract and the costs. That can cause a conflict if the Contractor does not give an EW for a problem and months later someone raises a CE for the same problem. The Employer might feel gypped and thinks that the Contractor should have told him a long time ago. The parties have not really had to deal with such situations on this project, but it has happened on the other schemes.
 - #4I mentions that on this project, the Contractor will issue a Technical Query (TQ) if he foresees any issues or changes. Subsequently, the Site Supervisor will have a look or will check the drawings and replies to the TQ and the time that has been notified.
- F. It is not clear from the project records how proactive the change management approach of the parties is.
- According to the interviewees, the change management approach by the Employer, the Project Manager and the Contractor during the project is largely proactive. All parties have a proactive approach by their involvement in the EW meetings, the risk review meetings and the progress meetings. Everyone is aware of any issues which are materializing, so they can give these attention early on. The approach is not entirely proactive, because there have been some changes which were not anticipated and to which the parties had to be reactive.
 - #3P argues that the change management approach comes down to people, because on the Elgin project (same NEC contract, same parties, but different Project Team) the approach is entirely reactive.
 - #1E argues that on this project, the Contractor does highlight things early in particular and that it helps that there is trust between the parties. The Contractor is raising these things because they are genuine concerns and the aim is to avoid any adverse impacts. It is not in the Contractor's interest for the job to be inefficient since finishing the project as early as possible will benefit both parties.
 - #6C argues that the Contractor raises any contradictories in the contract documents as issues early on.

(7-16) Change management procedure (standard processes)

Main findings:

- G. The clauses 60-65 in the NEC2 ECC set out the change management processes. The PMP (The Moray Council, 2013, pp. 18-19, 26-27), the standard forms and the project registers are complementary to these clauses. Together, they form the standard change management processes for this project.
- According to the interviewees, these processes correspond more or less with the ones in the assessment table.
 - There were a few remarks on the processes:
 - (10) The priority is determined informally by looking at the impact.
 - (11-12) There are only multiple change options in case of big changes.
 - (13) The Project Manager is the one with authority to make the decision, but sometimes others make the decision and the paperwork is done afterwards. The speed of decision-making depends on the priority and the impact of the change, and the work load.
 - Overall, the change management procedure is followed as consistent as should be.

(9+15-16) Change management procedure (documentation)

Main findings:

According to the interviewees, an audit trail is created by means of the standards forms and the project registers.

(5+6) Continuous improvement (review and share knowledge)

Main findings:

- A. There is nothing in the project records with regard to learning from changes and sharing this knowledge.
- 6/6 interviewees state that the Employer and the Contractor do not create 'lessons learned' specifically from change events during the project.
 - #3P stresses that it has no use. The design solutions are based on the best information at the time. For example, the sheet piling wall was not possible according to the geotechnical information. The actual geotechnical conditions on site may differ and require a change to the design. Such changes could not have been prevented as more ground investigation would have told you the same things. So you are as good as the information that is given.
 - #4 mentions that the parties do learn from changes unknowingly. Changes events are discussed informally, especially the large change events.
 - 5/6 interviewees (all, except #3P) state that there have been some overall lessons learned workshops in which change management issues were also dealt with. The lessons learned workshops were jointly and thus shared between the parties.
- B. There is nothing in the project records with respect to measuring the risk management performance.
- 5/6 interviewees (all, except #3P) state that the Employer and the Contractor do not measure the performance (efficiency and effectiveness) of the risk management processes during the project and adjust these if needed. There are several reasons for that.

- #2P, #4I and #6C mention that the risk management procedure has been developed over the previous flood schemes and works well, so it is not needed to improve this procedure.
- #5C stresses that as a company, the Contractor also quite regularly measures the performance (efficiency and effectiveness) of the internal procedures during the project and adjust these if needed. This information is passed on to the other parties during meeting, but not in great detail. For example, the Contractor only shares the information on his actual performance compared to his expected performance.
- #1E, #2P, #5C and #6C state that the parties do measure the performance of the risk management processes in terms of financial and time performance of the project by means of measuring the cost predictability of the project and the reliability of the target cost.

(x) Other change management components

- A. Other systems or processes which are relevant for creating an efficient and effective change management process on this project are:
- #1E: The collaboration with Scottish Government who provides the grant funding of the projects. The change management process can be used to help smooth the financial side of the project, which helps to reduce the risk of bad publicity and poor reputation for not managing money and helps the parties to ensure that the flow of money from government is good.
 - #6C: Informal discussion
- B. Remarks on existing components:
- #2E mentions that all systems or processes exist on the project.
 - #5C mentions an addition to 'early warning: informal

31.5 Overview of efficiency and effectiveness creating aspects on the project

Table 112: Overview of efficiency and effectiveness creating aspects on project Forres

Creating efficient and effective CM process (score 3-4)
(1) Change management objectives were aligned regarding the procedure and the results (e.g. distinction between 'preferred' and 'necessary' design changes)
(1) Early Contractor Involvement in the design phase
(1) Risk management objectives were aligned
<i>*(2) Clear, extensive and streamlined change management procedure</i>
<i>*(2) Extensive use of standard forms and project registers</i>
(2) Use of provisional allowance for certain design elements
<i>(2) Project Manager has control over all changes as they all stem from Project Manager's Instructions</i>
<i>(2) Open book regarding the Contractor's cost data</i>
(2) The Project Manager can act impartial and fair by means of help from the Independent Cost Consultant, as he draws up the quotation for variations
<i>(3) Joint risk workshop to tailor the risk register specific to the project and to allocate the risks to the party best able to manage them. The Employer's risk allowance covers unforeseen risks.</i>
<i>(3) Clear risk allocation</i>
<i>(3) The Contractor's risk allowance was negotiated and is part of the pain/gain share mechanism</i>
<i>*(3) The financial risk is shared by means of a pain/gain share mechanism, which promotes the partnership and encourages the Contractor to be innovative and efficient in order to create a 'gain' for all parties</i>
<i>(4) Clear risk management procedure</i>
<i>(4) Joint risk management of the Employer's risks</i>
(4) Risk management used to predict the costs to complete and the financial outcome of the project.
(4) Overall risk management approach is aligned and is largely proactive, and depends on the people involved.
(4) Risk management is closely related to change management
(7) Overall change management approach is aligned and is largely proactive, and depends on the people involved.
(7) Discuss variations informally prior to the formal procedure
<i>(7) Mutual formal and informal early warning obligation for variations due to risks and errors in documents</i>
(15) Use of standard forms and project registers to create an extensive audit trail
<i>(7-16) Overall, the change management procedure is followed as consistent as should be</i>
(7-16) No unexpected or contentious variations, there is not that contractual drive for the Contractor to make more money and for the Employer to keep the budget tight.
Could be done better to create efficient and effective CM process (score 2-2.5)
(1) The parties did not fully adhere to the change management objectives
(1) The works were not fully designed at the time of target setting
(5+6) The parties do not create lessons learned specifically from change events, but there are overall joint lessons learned workshops. The risk management performance is regularly measured by means of measuring the financial and time performance of the project.
(7-16) Standard change management processes are applied to a large extent
<i>(7-16)+T(4) The processing of CEs according to the NEC2 ECC increases the administrative burden for all parties, therefore the period of reply of CEs is not always met.</i>
Creating inefficient and ineffective CM process (score 1-1.5)
-

BOLD = (Related to) condition of contract, ITALIC = Amendment to contract, GREY = Important aspect, * = Influenced by the strategic partnering

31.6 Most important components according to the interviewees

Table 113: Ranking of the components by the interviewees of Forres

Components for building and sustaining trust				Components for an efficient and effective change management process			
	57	1.	Trustworthiness: Culture, policy	C	38	1.	Clearly defined change management procedure and roles/responsibilities therein
	48	2.	Reasonable behaviour				
C	48	3.	Trustworthiness of organization: Track record, reputation, competences (financial, technical)	C	31	2.	Joint goal setting for change management & risk management
	46	4.	Joint goal setting	C	28	3.	Equitable risk allocation
C	44	5.	Trustworthiness of person: Track record, reputation, competences (financial, technical)	C	26	4.	Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.
C	39	6.	Clearly defined communication system				
	36	7.	Emotional investments				
	35	8.	Repeated fulfilment of communications and interactions	C	26	5.	Appropriate documentation of the change process
C	32	9.	Equitable risk allocation	C	25	6.	Risk management system
C	31	10.	Joint problem-solving	C	21	7.	Early warning
	21	11.	System for continuous improvement of the relationship		18	8.	Learning from changes and sharing this knowledge
C	17	12.	Problem-solving at the lower levels				

32. Dikkowita: Interview questionnaire

Opening (10.00 – 10.15u)

- Kennismaken (rol/functie)
- Uitleg onderzoek (onderwerp, case study opzet)
- Uitleg interview opzet (doel, duur, opzet vragen, data analyse)

Vragen trust (10.15 – 11.05u)

Q1.Q2. Trustworthiness

Trustworthiness	(1) Seek partner with good track record, reputation and competence of financial and risk management
	(2) Seek partner with similar culture/policy
	(8) Reasonable behaviour (=working fairly and professionally)

3. De eerste vragen gaan over de aanbesteding. Was u zelf betrokken bij de aanbestedingsfase? (verder als JA)

10.15 (1)+(2) Volgens het eerste ORET voortgangsrapport is de ON geselecteerd door middel van directe onderhandelingen, waarbij het voorstel van de ON werd beoordeeld. Het ging o.a. om het Project Plan, het Design Plan en de Schedules voor planning, kosten etc.

8. OG: Was dit voorstel voldoende om te bepalen hoe betrouwbaar (bekwaamheid, welwillendheid, integriteit, voorspelbaarheid) de aannemer is om het werk uit te voeren? (Financiële & economische draagkracht, technische bekwaamheid)
9. Waren er nog andere factoren die invloed hadden op de keuze van de aannemer? (cultuur, beleid, politiek)
10. Het voorstel representeerde voornamelijk de organisatie. Is er ook op persoonlijk niveau onderzocht door de OG in hoeverre de vertegenwoordigers van de ON betrouwbaar zijn?

>eerst naar Q4 objectives

10.30 (8) Deze vraag gaat over redelijk gedrag. Volgens de projectdocumenten is de Sri Lanka Law van toepassing op het contract. De Sri Lanka law is een mix van o.a. Romeins-Hollands Civil Law en Brits Common Law. Contracten onder Romeins-Hollands recht zijn gebaseerd op het principe van 'good faith' oftewel redelijkheid en billijkheid. Dit principe beschermt OG en ON tegen opportunistisch gedrag van de ander. Het FIDIC YB bevat geen clausules over dit aspect.

5. Heeft 'redelijkheid en billijkheid' uit het Romeins-Hollands recht invloed gehad op het gedrag van OG en ON?
6. Hoe was de samenwerking qua vertrouwen in het gedrag van de ander, cultuur en werrelatie?
7. xHebben de Samenwerkingsafspraken invloed op het gedrag van OG en ON?

Q3.Q4. Objectives

Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)

10.20 (3) Deze vraag gaat over de projectdoelen. De doelstelling met betrekking tot het projectresultaat (kosten, tijd en kwaliteit) was vastgelegd in het contract en betrof het realiseren van de haven in combinatie met training en capacity building van de havenbeheerder. Het doel van de OG was om met dit project de kwaliteit van de visserij toe te laten nemen en te verbeteren. De doelen van de ON waren om de haven op te leveren conform contract, binnen beschikbare tijd en budget en met winst. Bij de start van het project kwam de wens van de OG om het projectresultaat te veranderen: binnen hetzelfde budget moest een haven gerealiseerd worden die ook geschikt is voor grotere schepen. Richting het einde van het project is een 'final scope agreement' gemaakt, waarbij is afgesproken dat met het beschikbare budget een zo compleet mogelijke visserijhaven moest worden gerealiseerd die ook deels geschikt is voor grotere schepen. Hiervoor moest o.a. de winstdoelstelling van de ON worden bijgesteld.

5. Zijn de gemaakte afspraken van de 'final scope agreement' nagekomen door OG en ON?
6. In hoeverre zijn de 'eigen doelen' van de OG en ON bereikt? (win-lose, partial win-partial win, win-partial win, win-win)

Volgens §4 (1) uit het FIDIC YB moesten de werken ook 'fit for purposes' zijn bij de oplevering en voldoen aan de 'Employer's Requirements' en aan de 'Contractor's proposal and schedules'.

7. Is deze afspraak nagekomen door de ON? (Waren de purposes duidelijk? Problemen met fouten in ER n.a.v. Contract Review door ON, FIDIC YB §5 (1) en §1 (9)?)

Volgens de projectdocumenten is er een Project Start-Up meeting geweest waarbij de werkwijze verder is afgestemd met zowel het Ministerie (MFARD), de projectorganisatie (PIU), de havenbeheerder (CFHC) en de ON. Het ging o.a. om de documenten flow, het overlegschema en de procedures voor facturatie en betaling. Daarnaast zijn er ook procedures afgestemd d.m.v. het PMP van de ON, zoals voor communicatie en wijzigingen. Volgens de projectdocumenten is er ook een kick-off meeting geweest.

8. Zijn de gemaakte afspraken met betrekking tot de werkwijze en procedures tijdens het project nagekomen door OG en ON?

9. Zijn er tijdens deze twee meetings ook afspraken gemaakt tussen OG en ON met betrekking de relatie? (hoe men met elkaar omgaat, elkaars belangen besproken). Zijn deze afspraken nagekomen?

>terug naar Q1 trustworthiness

Q5.Q6. Communication

Communication	(4) Clearly defined system of communication procedures and approaches
	(9) Repeated fulfilment of communications/interactions

10.35 (4) De volgende twee vragen gaan over communicatie tussen OG en ON. In het Projectmanagementplan en de Notitie Working Process zijn plannen opgesteld voor communicatie en informatie tijdens het project tussen OG en ON. Het gaat onder andere om een overlegsschema, voortgangrapportages, informatiestromen, communicatiemiddelen (DMS, brieven, fax, mail etc.), documentbenaming, standaard formats en procedures voor facturatie en betaling.

4. Hebben OG en ON zich gehouden aan deze opgestelde communicatie- en informatieplannen tijdens het project? (Werkte het goed? Problemen?)

Daarnaast komt het aspect communicatie ook voor in §1 (3) en §4 (21) uit het FIDIC YB. Volgens §1 (3) moet formele communicatie (i.e. goedkeuringen, certificaten, verzoeken) schriftelijk zijn en niet onredelijk onthouden of uitgesteld worden. De communicatieplannen in het PMP lijken overeen te komen met deze sub clausule. In het PMP zijn wel een reactietijd en een automatische acceptatieregeling toegevoegd.

5. Hielden OG en ON zich aan de reactietijd en automatische acceptatieregeling?
6. Verliep de schriftelijke formele communicatie beter door deze toevoeging? (Waarom toegevoegd?/Sanctie?)
7. Volgens de Particular Conditions is §3 (1) aangepast waardoor de Engineer volledige bevoegdheid kreeg om documenten namens de OG te tekenen. Waarom is deze sub clausule aangepast?

Volgens §4 (21) uit het FIDIC YB moet de ON maandelijkse voortgangrapportages opstellen en opsturen naar de Engineer. De inhoud van de rapportages staat vermeld in de sub clause. De procedure voor rapportage in het PMP lijkt grotendeels overeen te komen met deze sub clausule. Volgens de PMP worden er ook wekelijkse voortgangrapportages opgesteld voor de Engineer. Dit is een afwijking t.o.v. FIDIC YB.

8. Waarom werden er ook wekelijkse voortgangrapportages gevraagd van de ON?

10.40 (9) Naast formele communicatie is informele communicatie ook erg belangrijk in een project.

3. Is er naast de formele vergaderingen ook informeel contact geweest tussen OG en ON?

Q7. Problem solving

Problem solving	(5) Adopt joint problem-solving philosophy
	(10) Problem-solving to mutual satisfaction at the lower levels

10.45 (5) + (10) Deze vraag gaat over problemen oplossen. §2 (5) en §20 (1) uit het FIDIC YB behandelen claims van respectievelijk de OG en de ON. Het besluitvormingsproces van de Engineer uit §3 (5) over de kostenvergoeding en/of tijdsverlenging speelt een belangrijke rol in beide procedures. Als de partijen er niet uitkomen na dit proces, dan kan het geschil geëscaleerd worden naar de Dispute Adjudication Board (DAB). Daarna kan het geschil nogmaals geëscaleerd worden naar arbitrage. De procedures en regels hiervoor zijn vastgelegd in §20 en de Appendix to tender. Volgens de Particular Conditions is de laatste paragraaf van §20 (4) aangepast met als gevolg dat het besluit van de DAB altijd bindend en van toepassing totdat het geschil is beslecht door arbitrage.

9. Waarom is deze paragraaf aangepast? Welke problemen worden hiermee opgelost of vermeden?
10. Werkten deze clausules uit het FIDIC YB m.b.t. het afhandelen van claims goed? Problemen? (Onpartijdigheid Engineer?/Adhoc DAB?/Opeenhoping van claims?)
11. Hadden de claims een invloed op het vertrouwensniveau tussen OG en ON?
12. Wat werd er tijdens het project gedaan om problemen langs minnelijke weg op te lossen? (Vroegtijdige waarschuwing?/Samen naar oplossing zoeken?)
13. Zijn alle problemen langs minnelijke weg opgelost? (Wel naar management geëscaleerd?)

Q8. Risk allocation

Risk allocation	(6) Draft a clear, unambiguous and equitable contract

10.50 (6) Deze vraag gaat over risicoverdeling. In FIDIC YB wordt de risicoverdeling tussen OG en ON behandeld in o.a. §4 (12) (bodemaspecten), §17 (schade aan het werk) en §19 (force majeure). In het contract is geen andere risicoverdeling opgenomen met bijv. projectspecifieke risico's of een verschuiving van risico's.

5. Was de risicoverdeling tussen OG en ON uit het FIDIC YB duidelijk? (Werkte het goed? Problemen?)
6. Waren de risico's toebedeeld aan de partij die het beste in staat is om deze te beheren?
7. Zijn er risico's die gedeeld worden door OG en ON qua aansprakelijkheid? (delen van de verliezen en de winsten). Hoeveel % van het totaal aantal risico's zijn gedeelde risico's?

8. xWerd de partij beloond voor het dragen van een risico?

Q9. Continuous improvement

Continuous improvement	(7) Agreed system for achieving continuous improvement of the relationship
	(11) Emotional investments (e.g. by formalized team building workshops)

10.55 (7)+(11) Deze vraag gaat over het continu verbeteren van de relatie tussen OG en ON. In het FIDIC YB en de project documenten heb ik niks kunnen vinden over dit onderwerp.

5. Zijn er meetings of workshops geweest ten behoeve van het verbeteren van de relatie tussen OG en ON? (Deed iedereen serieus mee?/Worden gemaakte afspraken nagekomen?)
6. Was er een systeem of waren er maatregelen afgesproken tussen OG en ON ten behoeve van het verbeteren van de relatie?

Q10. Other systems or processes

11.00 De gestelde vragen over vertrouwen hadden allemaal betrekking op systemen en processen die volgens de literatuur relevant zijn voor het creëren en behouden van vertrouwen tussen de partijen. (Zie 1.4 voor lijst componenten)

3. Zijn er overige systemen of processen in het project die relevant zijn geweest voor het creëren en behouden van vertrouwen tussen OG en ON?

Vragen change management (11.05 – 11.40u)

Q1. Objectives

Anticipate change	(1) Align project goals and objectives

11.05 (1) De eerste vragen gaan over de doelstellingen met betrekking tot wijzigingenbeheer en risicomanagement. In het FIDIC YB en de project documenten heb ik niks kunnen vinden over dit onderwerp.

5. Waren er gedeelde doelstellingen m.b.t. wijzigingenbeheer tussen OG en ON? (m.b.t. resultaat, procedures, relatie). Worden de gemaakte afspraken nagekomen?
6. Waren er gedeelde doelstellingen m.b.t. risicomanagement tussen OG en ON? (m.b.t. resultaat, procedures, relatie). Worden de gemaakte afspraken nagekomen?

Q2. Risk allocation

Anticipate change	(3) Agree on project philosophy with regard to risk allocation and type of changes to consider

Zie Q5 van trust.

Q3. Risk management

Anticipate change	(4) Prior identification of areas where changes likely occur (e.g. by risk management)

11.10 (4) Deze vraag gaat over risico management. Volgens het PMP bestond het risico management door de ON uit het opstellen en bijhouden van een risico register en het bespreken van risico's tijdens de progress meetings. Daarnaast hield de Engineer namens de OG een risicoregister (Project Risk Log) bij en nam risico's op in de notulen en de voortgangrapportages.

7. Hebben de OG en de ON zich gehouden aan deze risk management plannen tijdens het project? (Werkte het goed? Problemen?)
8. In hoeverre werden risico's proactief aangepakt door de OG en ON? (=risico's ver van tevoren aan ziet komen en impact proberen te minimaliseren) (geheel reactief, grotendeels reactief, half reactief/half proactief, grotendeels proactief, geheel proactief)
9. Speelde risicomanagement een rol in de wijzigingsprocedure?

Q4.Q5.Q6. Change management procedure

Anticipate change	(2) Clearly defined change management procedures and processes and roles and responsibilities therein
	(3) Agree on project philosophy with regard to risk allocation and type of changes to consider
Recognize change	(8) Early identification of potential changes
	(9) Standard change management process: Assess potential impact (e.g. by value engineering) and create a proposed change order
	(10) Standard change management process: Document the proposed change in a log
Evaluate change	(11) Standard change management process: Determine priority of the change
	(12) Standard change management process: Selection of optimum change options by consulting all relevant parties
	(13) Standard change management process: Identify the likely impacts of different change options
	(14) Standard change management process: Prompt decision making with due authority as to whether to accept/reject the change
Resolve change	(15) Standard change management process: Communicate final change decision to all team members whose work is affected by it
	(16) Appropriate documentation to record all decisions within the change process

Monitor implementation	(5) Monitor and record implementation

11.15 (2) + (3) De komende vragen gaan over de wijzigingsprocedure. In het PMP is de wijzigingsprocedure opgenomen. Door de aanpassing van §13 (1) in de Particular Conditions wijkt de toegepaste wijzigingsprocedure iets af. Een directe instructie voor een wijziging door de Engineer is niet mogelijk doordat OG en ON voorafgaand eraan het eens moeten zijn over de gevolgen voor tijd en kosten. Daarnaast is een extra stap toegevoegd, namelijk het checken of er voldoende financiële middelen zijn om de wijziging door te voeren.

9. Waarom is ervoor gekozen om af te wijken van de standaard wijzigingsprocedure in het FIDIC YB? Welke problemen worden hiermee opgelost of vermeden?
10. Hebben OG en ON zich gehouden aan deze wijzigingsprocedure tijdens het project?
11. Hoe efficiënt en effectief werkte deze wijzigingsprocedure tijdens het project? (Waren §3 en §13 van het FIDIC YB duidelijk betreft de processen, de rollen en verantwoordelijkheden en de type wijzigingen?/Andere problemen?)

11.20 (8)

7. In hoeverre werden wijzigingen proactief aangepakt door OG en ON? (=wijzigingen ver van tevoren aan ziet komen en impact proberen te minimaliseren) (geheel reactief, grotendeels reactief, half reactief/half proactief, grotendeels proactief, geheel proactief)

Volgens het FIDIC YB §8 (3) is de ON verplicht de Engineer te waarschuwen voor toekomstige gebeurtenissen of omstandigheden die een negatieve impact hebben op de werken, de kosten of de planning.

8. Speelt deze waarschuwingsplicht een rol in de wijzigingsprocedure?

11.25 (5) + (9-16) De VTW-procedure geeft niet de gedetailleerde stappen weer. Daarom volgt nu een vraag hierover. De vraag heeft betrekking op de gehele VTW-procedure, dus zowel aan OG's als ON's zijde.

2. xZijn de volgende activiteiten onderdeel van de VTW-procedure?

Recognize change	8. Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
	9. Het wijzigingsvoorstel opnemen in een logboek	X
Evaluate change	10. De prioriteit van de wijziging bepalen	-
	11. Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	X
	12. De impacts van de verschillende wijzigingsopties bepalen	X
	13. (Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
Resolve change	14. Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
	15. Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	X
Monitor implementation	5. De uitvoering van de wijziging monitoren en documenteren.	-

Q7. Continuous improvement

Learn from change	(6) Conduct a review and create lessons learned from the change event
	(7) Update shared databases and incorporate lessons learned for project and organization

11.30 (6)+(7) Deze vraag gaat over leren van de wijziging. In het FIDIC YB en de project documenten heb ik niks kunnen vinden over het leren van wijzigingen en het delen van deze kennis.

- Zijn er tijdens het project 'lessons learned' gecreëerd van wijzigingen? (evaluatie, root cause analysis, hoe voorkomen)
- Wordt deze kennis gedeeld tussen OG en ON?
- xWerd de performance (efficiëntie en effectiviteit) van de risico management processen tijdens het project gemeten en bijgestuurd?

Q8. Other systems or processes

11.35 De gestelde vragen over wijzigingen hadden allemaal betrekking op systemen en processen die volgens de literatuur relevant zijn voor het een efficiënt en effectief wijzigingenproces (Reeds besproken aspecten laten zien). (Zie 1.4 voor lijst componenten)

1. Zijn er overige systemen of processen in het project die relevant geweest zijn voor de efficiëntie en effectiviteit van het wijzigingenproces? (Reeds besproken aspecten laten zien)

Extra vragen losstaand van het project (11.40 – 11.55u)

11.40 TRUST:

1. Betrouwbaarheid organisatie: Track record, reputatie, competenties (financieel, technisch)
2. Betrouwbaarheid persoon: Track record, reputatie, competenties (financieel, technisch)
3. Betrouwbaarheid: Cultuur, beleid
4. Gedeelde projectdoelen
5. Duidelijk communicatiesysteem
6. Samen problemen oplossen
7. Eerlijke/proportionele risicoverdeling
8. Systeem voor continu verbeteren van de relatie
9. Veel communicatie en interacties
10. Problemen oplossen op het eerste niveau
11. Emotionele investeringen
12. Redelijk gedrag

Q11. Effectiveness of the systems or processes

4. Welke systemen of processen zijn het meest effectief voor het creëren en behouden van vertrouwen tussen OG en ON? (Ranking maken met de besproken aspecten in de vorm van kaartjes, extra blanco kaartjes voor eventuele aanvulling)

Q12. Trust clauses in contracts

4. Welke systemen of processen zou u opnemen in het contract met betrekking tot vertrouwen tussen OG en ON? (Kiezen uit de besproken aspecten en eventuele aangevulde aspecten)

11.45 CHANGE MANAGEMENT:

1. Gedeelde projectdoelen voor wijzigingenbeheer & risicomanagement
2. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
3. Eerlijke/proportionele risicoverdeling
4. Risicomanagement systeem
5. Leren van wijzigingen en kennis hiervan delen
6. Vroegtijdige waarschuwingsplicht
7. Adequate documentatie van de wijziging
8. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren

Q9. Importance of the systems or processes

4. Welke systemen of processen zijn het belangrijkste voor de efficiëntie en effectiviteit van het wijzigingenproces? (Ranking maken met de besproken aspecten in de vorm van kaartjes, extra blanco kaartjes voor eventuele aanvulling)

Q10. Change clauses in contracts

4. Welke systemen of processen zou u opnemen in het contract met betrekking tot wijzigingen? (Kiezen uit de besproken aspecten en eventuele aangevulde aspecten)

11.50 INVLOED

Q11. Influence of trust on effectiveness and efficiency of change management process

De onderwerpen ‘vertrouwen’ en ‘wijzigingen’ zijn bewust gekozen voor dit afstudeeronderzoek en staan niet los van elkaar. Het hoofddoel van het onderzoek is om te onderzoeken hoeveel invloed het vertrouwensniveau tussen OG en ON heeft op de effectiviteit en efficiëntie van het wijzigingenproces.

Effectiviteit (=doeltreffendheid) is een indicator voor de mate dat het doel bereikt is = $\frac{\text{werkelijke prestatie}}{\text{normatieve prestatie}}$

Efficiëntie (=doelmatigheid) is een indicator voor de hoeveelheid middelen die ingezet zijn om het doel te bereiken = $\frac{\text{feitelijke inspanning}}{\text{normatieve inspanning}}$

7. Voor hoeveel % wordt de effectiviteit van het wijzigingenproces beïnvloed/bepaald door het vertrouwensniveau tussen OG en ON?
8. Voor hoeveel % wordt de efficiëntie van het wijzigingenproces beïnvloed/bepaald door het vertrouwensniveau tussen OG en ON?

(0% geen invloed, 25% weinig invloed, 50% veel invloed, 75% heel veel invloed of 100% compleet beïnvloed)

Afsluiting (11.55 – 12.00u)

- Verslag en validatie
- Anonimiteit?
- Eventueel overige vragen per mail
- Verbeteringen interview?
- Onderzoeksrapport opsturen

33. FIDIC control group: Interview questionnaire

Opening

Brief introduction of my study

My name is Lonneke Cheung. I study Construction Management & Engineering at the University of Technology in Delft, The Netherlands. This is a Master that focuses on the management part in the construction industry, so it includes courses such as Project Management, Process Management, Contract Management, Asset Management and Cross Cultural management. To finalize this study students must conduct a research on a subject related to this Master, preferably within a company. I chose Contract Management as the main subject of my research and specifically chose RHDHV over other companies because of its knowledge, network and reference projects. I have been a graduate intern at RHDHV in Amsterdam since May this year. The research takes about 8-10 months, which means I will probably be finished by February.

Explanation research setup

The Master Thesis research concerns the comparison of the UAC-IC 2005 contract (Dutch contract) with the two international Design & Build construction contracts NEC3 ECC and FIDIC yellow book with regard to the subjects 'trust' and 'variations'. These subjects were deliberately chosen for this research. The main objective of the research is to determine the influence of the trust level between Employer and Contractor on the efficiency and effectiveness of the change management process.

The research started with a literature study on 'trust' and 'variations' which concluded with a theoretical assessment model. Subsequently, I analysed the standard forms of contract and the project records on the basis of this model, which resulted in a theoretical analysis. I have selected one case study project for each contract (for the Dutch contract two: 1 small and 1 large project) and will make a practical analysis on the basis of the interviews:

- UAC-IC: Project Bijlmerweide, Amsterdam, The Netherlands
- UAC-IC: Project Drachtsterweg, Leeuwarden, The Netherlands
- FIDIC: Project Dikkowita Fishery Harbour, Dikkowita, Sri Lanka
- NEC: Project Forres Flood Alleviation Scheme, Forres, Scotland

To validate the interview results, it is important to interview people from the Employer's, the Engineer's and the Contractor's team. Due to the claims at the end of the Dikkowita project, I am not allowed to speak to the Employer and the Contractor. This was the Engineer's condition to participate in the research. Since there was not really another suitable project, I decided to select this project anyway. The consequences are that I had to find other ways to validate the interview results. Therefore I selected a FIDIC control group consisting of Contract Specialists and 'Engineers' to answer some questions about the FIDIC clauses and the amendments to these in the Dikkowita project.

The next step of the research is the data analysis in which I will compare the 4 case study results and draw conclusions and recommendations from these.

Explanation interview setup

- The objective of the interviews with the FIDIC control group is to validate the theoretical analysis by researching how certain contract clauses and project management processes work in practice. In other words, I looked at what is on paper and will check how it is dealt with in practice.
- Each question concerns an aspect related to 'trust' or 'variations'. The number of aspects was reduced to aspects which are covered in FIDIC YB.
- The interview contains 5 main aspects with questions about 'trust' and 1 main aspect with questions about 'variations'.
- Every question starts with an introduction in which I indicate what I have found in the FIDIC YB with regard to the aspect. Subsequently, there are a couple of questions.
- Most questions were set up as YES/NO questions due to accuracy and efficiency, but you will need to substantiate your answer (e.g. with an example). You can type your answers below the questions. I indicated this 'answer' area. Try to keep the answers brief, but clear. You may also answer in DUTCH.
- At the end of the questionnaire I described what I will do with the answers.

Questions trust

Q1. Reasonable behaviour

This question covers reasonable behaviour. Many countries have a laws which include the principle of good faith. This principle protects the Employer and the Contractor against opportunistic behaviour of the other party.

8. Does the principle of good faith in the laws have an influence on the behaviours of the Employer, the Engineer and the Contractor?

I could not find any clauses in the FIDIC YB which explicitly state how the parties should act (e.g. reasonable and fair).

9. Does the FIDIC YB contain such clauses (explicit or implicit)? If yes, do these clauses have an influence on the behaviours of the Employer, the Engineer and the Contractor?

Q2. Objectives

According to clause 4.1 in the FIDIC YB, the works must be 'fit for purposes' and must meet the 'Employer's Requirements' and the 'Contractor's proposals and schedules'.

10. In general, is 'fit for purposes' an achievable objective?

The Contractor is supposed to state in his letter of tender that he has ascertained that the Employer's Requirements contain no errors or other defects. Before Commencement of the Works, pursuant to clause 5.1, the Contractor is obliged to scrutinize any design criteria and calculations in the Employer's Requirements and the items of reference mentioned in clause 4.7. Any error, fault or other defect found in these documents must be notified to the Engineer. Subsequently, the Engineer determines if it constitutes a Variation. After Commencement, according to clause 1.9, the Contractor may be entitled to financial compensation and/or extension of time if he finds any error, fault or other defect in the Employer's Requirements.

11. Is it clear who is responsible for errors in the Employer's Requirements?

Q3. Communication

Communication is covered in FIDIC YB in clauses 1.3 and 4.21. Pursuant to clause 1.3, formal communication (i.e. approvals, certificates, determinations) must be in writing and must not be unreasonably withheld or delayed. The Contractor has to draw up monthly progress reports and send these to the Engineer. The content of the reports are covered in clause 4.21.

1. In general, do Contractors adhere to these clauses?

Pursuant to the Particular Conditions, clause 3.1 was amended in the Dikkowita project. The following was added:

'The Engineer shall have full authority to execute any and all instruments requiring Engineer's Signature and to act on behalf of the Employer with respect to all matters arising out of this Contract, whose duties shall also include the reviewing, approval or rejection of the Work or any part thereof. In exercising such authority, the Engineer shall act reasonably and impartially and shall attend the construction of the Works as required, and carry out his duties in a conscientious manner'.

2. Could such full authority for the Engineer to act on behalf of the Employer lead to any problems in a project?

Q4. Problem solving

This question deals with problem-solving. Clauses 2.5 and 20.1 in the FIDIC YB deal with claims from the Employer and the Contractor respectively. If the parties have not come to an agreement after the Engineer's determination process, then the dispute may be escalated to the Dispute Adjudication Board (DAB). If the dispute is still not resolved, it may be referred to arbitration. The procedures and rules for this escalation process are included in clause 20 and in the Appendix to Tender.

14. Do these clauses in FIDIC YB related to claims work well? Or are there problems?

The Engineer's determination (clause 3.5) plays an important role in both claim procedures.

15. Does the Engineer's impartiality cause any problems in the claims procedures? Any accusations?
16. Do claims have an influence on the trust level between the Employer, the Engineer and the Contractor?

According to the Particular Conditions, the last paragraph of clause 20.4 was deleted in the Dikkowita project and replaced with:

If the Dispute Adjudication Board has given notice of its decision as to the matter in dispute to the Employer and the Contractor, then the Dispute Adjudication Board's decision is binding and effective upon the Employer and the Contractor, until, as the case may be, finally settled by arbitration in accordance with Sub-Clause 20.6.

17. Why do you think this clause 20.4 was amended? Which problems are solved or avoided by the amendment?

Q5. Risk allocation

This question deals with the risk allocation. In the FIDIC YB, the risk allocation is covered in several clauses, for instance, in 4.12 (Unforeseeable Physical Conditions), 17 (Damage to the Works) and 19 (Force Majeure).

6. Is this risk allocation between the Employer and the Contractor in the FIDIC YB clear?
7. Are these risks in the FIDIC YB allocated to the party best able to manage it?

According to the Particular Conditions, clause 14.1 was amended in the Dikkowita project,

The Contract Price shall be the Accepted Contract Amount subject to adjustment in accordance with the Contract and of quantities subject to remeasurement. The Works shall be paid based on lump sum items, quantities and re measured quantities which shall be agreed between the Engineer and the Contractor applied to rates and prices contained within the Bill of Quantities.

.....In event that further to re-measurement of quantities it can be ascertained that the Accepted Contract Amount shall be exceeded, the Engineer shall, together with the Contractor investigate reductions in the scope of works and implement Variations to the Contract which enable the Accepted Contract Amount not to be exceeded. Alternatively the Employer may elect to provide additional funding which must be verified and accepted by the Contractor'.

8. A Design & Build contract in combination with re-measurable quantities seems to be a risk for the Employer since the Contractor determines the design. Do you think this combination of D&B and re-measurable quantities can cause any problems in a project?

Q6. Other FIDIC clauses

4. Are there any other FIDIC clauses which are important for building trust between the Employer (and Engineer) and the Contractor?

Questions change management

Q1. Change management procedure

The following questions cover the variations procedure. The Variations procedure is covered in clause 13 in the FIDIC YB.

12. Is the Variations procedure in FIDIC YB efficient and effective? (Does it work well or are there any problems?)
13. Are the processes, the roles and responsibilities, and the type of variations claimable clear in FIDIC YB? Other problems?

Clause 8.3 in the FIDIC YB contains an early warning provision. The Contractor must notify the Engineer for future events or circumstances which may have a negative impact on the works, the costs or the programme.

14. Does this early warning obligation play a role in the variations procedure? (e.g. early identification of potential variations)
15. Are there any other early warning clauses in the FIDIC YB? Do these play a role in the variations procedure?

Q2. Other FIDIC clauses

2. Are there any other FIDIC clauses which are important for creating an efficient and effective change management process?

Closing

I will copy the main points of your answers to a report format. Subsequently, I will compare all given answers for the Dikkowita project. For the purpose of validation of the research, all interview reports will be included in the annex of the final report.

- May I include your name in the report? YES/NO
- May I email you if I have additional questions or if some answers are not clear? YES/NO

The final report will probably be finished in February. All participants will receive this report by email.

Thank you for your co-operation. I really appreciate it!

Kind regards,

Lonneke

34. Dikkowita & FIDIC control group: Interview reports

INTERVIEW VERSLAG #1P

Interview:	Project Dikkowita Fishery Harbour t.b.v. Master Thesis
Datum van interview (DD/MM/JJJJ):	23-10-2014
Tijd:	10.00 – 12.00u
Locatie:	Kantoor RHDHV Nijmegen (Barbarossastraat 35)
Interview gepland door:	Lonneke Cheung
Datum verslag (DD/MM/JJJJ):	17-11-2014
Gevalideerd (DD/MM/JJJJ):	24-11-2014

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
LC	Lonneke Cheung	Afstudeerder	TU Delft/RHDHV	-
HV	Herald Vervoorn	'The Engineer'	RHDHV	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
- De aanbesteding was op basis van directe onderhandelingen. - Het voorstel van de ON was uitgebreid, vooral op het gebied van techniek, hierdoor kon de OG goed bepalen of de ON technisch bekwaam genoeg was om het werk uit te voeren. - Er was <u>niet</u> gevraagd naar bewijs van financiële en economische draagkracht, omdat de ON (BAM International) een bekende aannemer is. - De financiering van het project was een belangrijke factor voor de keuze van de aannemer. BAM nam zelf het initiatief om de financiering voor elkaar te krijgen om het project te realiseren en ging daarna pas met hun voorstel naar het MFARD van Sri Lanka. - Op persoonlijk niveau waren er tijdens de aanbesteding <u>geen</u> eisen gesteld aan de werknemers van de ON. De aanbesteding vond plaats in 2006, terwijl de uitvoering begon in 2009. Het tenderteam was <u>niet</u> hetzelfde als het uitvoeringsteam. De werknemers werden pas bekend gemaakt na het tekenen van het contract in het Project Management Plan (PMP) van de ON, de OG had hier dan <u>geen</u> invloed meer op. De ENG kon echter een medewerker van de ON laten vervangen, maar <u>niet</u> zonder een geldige reden.	
Redelijk gedrag	
- Redelijkheid en billijkheid uit het Romeins-Hollands recht van Sri Lanka speelt pas een rol als er conflicten zijn. - Volgens par. 3.1 uit de Particular Conditions en par. 3.5 uit het FIDIC YB moest de Engineer zich redelijk en billijk gedragen. Voor de ON staat dit niet expliciet in FIDIC YB, maar uit par. 4.9 kan afgeleid worden dat de ON zich tevens redelijk en billijk moest gedragen. De ON moest namelijk voldoen aan zijn taken, verplichtingen en verantwoordelijkheden in het contract, terwijl het contract normaal gesproken redelijk en billijk is. - Op organisatie niveau waren de ON en OG redelijk en billijk. - Op persoonlijk niveau waren medewerkers van de ON soms minder redelijk en billijk. De kwaliteit die de ON leverde was goed, maar er waren enkele contractuele issues. De ON diende veel verzoeken tot wijziging in die soms onredelijk waren of onredelijk geprijsd. Het was moeilijk om een compromis te sluiten met de projectmanager van ON, er moest vaak geëscaleerd worden naar management waarna het compromis wel geaccepteerd werd. Als compromissen niet konden worden overeengekomen, dan kon dit leiden tot een aanpak van gewoon slikken of stikken. 90% van de tijd was de sfeer vriendelijk, 10% van de tijd probeerden de OG en ON vooral de eigen belangen te beschermen.	
Projectdoelen	
- De gemaakte afspraken in de final scope agreement waren <u>niet</u> geheel nagekomen door de ON. De ON diende eerst een wijziging en daarna een claim in over de aansluiting van de brug op de weg, want doordat zijn ontwerp aangepast moest worden, vielen de kosten veel hoger uit dan was geraamd door hem. Beide werden afgewezen door de ENG, maar er waren wel afspraken gemaakt over een gezamenlijke oplossing voor het probleem en beide partijen hadden de intentie het probleem zo op te lossen. Echter, nadat de OG zijn deel van de oplossing had uitgevoerd, besloot de ON zich terug te trekken. Relatief gezien ging het niet om veel geld in het gehele project, maar als de OG het werk zelf moest doen, zou het 5x zoveel kosten als begroot door ON. De OG had weinig middelen om de ON te forceren het werk alsnog uit te voeren, want de ENG kon nog wel een claim indienen voor de vertraagde oplevering, maar de OG kon bijvoorbeeld geen betaling achterhouden omdat de financiering via ORET ging. Het werk zou uiteindelijk afgemaakt worden door een andere aannemer. - De eigen doelen van de OG waren geheel bereikt, want de haven is compleet en van goede kwaliteit (WIN). - De eigen doelen van de ON waren deels bereikt, want kwalitatief gezien heeft de ON een goede, complete haven afgeleverd, maar de ON heeft waarschijnlijk minder winst of zelfs verlies gemaakt met dit project (PARTIAL WIN). - De wijzigingen waren noodzakelijk om het werk 'fit for purposes' op te leveren. Het doel van de OG was duidelijk vastgelegd aan de hand van een nieuwe layout van de geplande werken. De eis 'fit for purposes' werd soms ook gebruikt bij het beoordelen van claims. Behalve de aansluiting van de brug met de weg heeft de ON alles 'fit for purposes' opgeleverd. - De gemaakte afspraken tijdens de PSU en in het PMP met betrekking tot de werkwijze en de procedures werden over het algemeen nagekomen door de OG, ENG en ON. - Er waren <u>geen</u> afspraken gemaakt met betrekking tot de relatie (=hoe men met elkaar omgaat). Er was enkel afgesproken dat alle communicatie via de Engineer moest lopen. De Sri Lankaanse cultuur is anders in de zin dat 'openheid' gecreëerd wordt aan de hand van bijvoorbeeld een kick-off meeting en regelmatig overleg en daarin mensen de mogelijkheid te geven om vragen te stellen en zo tot een goede samenwerking te komen.	

Communicatie - De partijen hielden zich aan de opgestelde communicatie- en informatieplannen tussen OG en ON tijdens het project. Dit zijn standaard plannen van de ON. Er waren geen problemen. - Over het algemeen hielden OG, ENG en ON zich aan de vastgestelde reactietijden en automatische acceptatieregeling. Sommige reactietijden waren opgenomen in de Particular Conditions en waren gehalveerd t.o.v. de General Conditions. Soms had de ENG weinig tijd om te reageren. Een planning die aangaf wanneer documenten gestuurd zouden worden en een prioriteitenlijst meesturen waren daarom belangrijk. Bij dit aspect is redelijkheid en billijkheid ook van belang. - De automatische acceptatieregeling is <u>geen</u> verbetering voor de schriftelijke formele communicatie t.o.v. het FIDIC YB, omdat partijen hier misbruik van kunnen maken. - De OG en de ON hebben de Particular Conditions opgesteld, de ENG was hier <u>niet</u> direct bij betrokken. Par. 3.1 is waarschijnlijk aangepast (ENG krijgt bevoegdheid om documenten namens OG te tekenen) vanwege efficiëntie omdat de ENG meer ervaring heeft met FIDIC YB. De aanpassing geeft wel een tegenstrijdigheid, want in dezelfde paragraaf staat dat de ENG zich onpartijdig moet gedragen. - De ON kwam zelf met het aanbod om wekelijkse voortgangsrapportages op te stellen, dit was niet gevraagd door de OG. Deze gebruikte de ON ook intern om een update te geven. - De kantoren van de ENG en ON stonden naast elkaar. Informeel contact tussen OG en ON verliep via de ENG of zijn team. Er was veel interactie tussen de partijen op verschillende niveaus. Cultuur speelde hierin wel een rol. Het team van de ENG bestond vooral uit Sri Lankanen, terwijl het team van de ON uit een mix van Sri Lankanen en expats bestond. Er was meer interactie tussen de Sri Lankanen onderling.
Problemen oplossen - Par 20.4 uit het FIDIC YB is waarschijnlijk aangepast in de Particular Conditions (besluit DAB is altijd bindend tot beslechting arbitrage) vanwege praktische redenen. Het was door de afwikkeling van de financiering nodig om het project snel af te ronden. De ENG was <u>niet</u> direct betrokken bij de contractvoorbereiding. - De clauses uit het FIDIC YB met betrekking tot het afhandelen van claims werkten goed betreft de 'determinations'. De onpartijdigheid van de ENG was <u>geen</u> issue, mede doordat niet de Resident Engineer, maar de Project Directeur van RHDHV de bevoegdheid had om force majeure en claims toe te kennen. Daarnaast werd er regelmatig een senior contract adviseur erbij gehaald. Op het eerste niveau is de ENG weleens beschuldigd van partijdigheid, maar dit was <u>niet</u> het geval op management niveau. Bovendien heb ik me vanaf het begin zo opgesteld (e.g. bij meetings) dat de OG niet zou denken dat ik partijdig zou zijn voor de ON, omdat deze ook Nederlands is. - Claims waren beheersbaar en werden 1 voor 1 afgehandeld. - Alleen de onverwachte en onrealistische claims of variations hadden een invloed op het vertrouwensniveau tussen OG, ENG en ON, vooral tussen de laatste twee omdat de ENG veel afhandelde namens de OG. - Tijdens het project werden problemen langs minnelijke weg opgelost door: claims informeel te bespreken, eerst draft determinations op te stellen, te escaleren naar management, management overleg (voor ENG en ON project directeuren en contract specialisten erbij halen) en vroegtijdige waarschuwing van de ON (in de vorm van notifications, hierdoor kon de ENG nog bijsturen). - Alle problemen waren langs minnelijke weg opgelost. Er waren wel problemen naar management en naar de overheden (NL en SL) geëscaleerd.
Risicoverdeling - De risicoverdeling tussen OG en ON uit het FIDIC YB was duidelijk, behalve soms voor de vergunningen. Via de Particular Conditions par 4.10 is het risico van een onverwachte bodemgesteldheid meer verschoven naar de OG. Het bepalen en het bewijzen of de condities echt onverwacht waren, was echter moeilijk voor ON. - Over het algemeen waren risico's toebedeeld aan de partij die het beste in staat was deze te beheren, maar betreft de bodemgesteldheid niet helemaal. De OG was hiervoor verantwoordelijk. Aan de ene kant had de OG de locatie gekozen, maar aan de andere kant had de OG geen invloed op het ontwerp van de ON. - Er waren <u>geen</u> risico's die gedeeld werden qua aansprakelijkheid door OG en ON. - De ON werd beloond voor het dragen van het risico via een risicoreservering in de inschrijfsom. Bovendien werd er gewerkt met verrekenbare hoeveelheden (bijvoorbeeld voor de lengte van de damwandplanken, niet voor type of kwaliteit en hoeveelheid steen voor golfbreker) doordat de geotechnische condities onbekend waren. Met een D&B contract kan de ON hier misbruik van maken, omdat hij diegene is die het ontwerp bepaalt.
Continu verbeteren van de relatie Tijdens het project waren er <u>geen</u> meetings of workshops geweest en er waren ook <u>geen</u> maatregelen afgesproken tussen OG en ON ten behoeve van het verbeteren van de relatie. Het verbeteren van de relatie gebeurde wel informeel.
Overige systemen of processen - Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor het creëren en behouden van vertrouwen tussen OG en ON. - Aanvulling op 'veel communicatie en interacties': op verschillende niveaus.
3. Antwoorden op de interviewvragen over 'wijzigingen'
Projectdoelen - De doelstellingen van OG en ON met betrekking tot wijzigingenbeheer waren afgestemd op elkaar betreft het resultaat (binnen budget houden en moest overeenkomst zijn) en de procedures. - Er waren <u>geen</u> gedeelde doelstellingen met betrekking tot risico management tussen OG en ON.
Risico management - De ENG had <u>geen</u> inzicht in het risico management dat de ON uitvoerde. Risico management door de ENG verliep goed, de OG bleef goed op de hoogte van de risico's doordat deze opgenomen waren in de notulen en de voortgangsrapportages. - De aanpak van risico's door de OG en ON was half reactief/half proactief. De ON kon bijvoorbeeld niet doorwerken doordat er vissers nog aanwezig waren op de bouwplaats. De OG wist ook niet wat hiermee gedaan moest worden. De ENG was daarentegen geheel proactief en loste dit soort problemen zoveel mogelijk op. - Risico management speelde <u>geen</u> rol in de wijzigingsprocedure.

Wijzigingsprocedure	
- Door de financiering van het project (maximum budget) moest men afwijken van de standaard wijzigingsprocedure uit het FIDIC YB. - De OG, ENG en ON hielden zich aan de vastgestelde wijzigingsprocedure tijdens het project. - De vastgestelde wijzigingsprocedure was project specifiek door de financiering. Deze wijzigingsprocedure was <u>niet</u> altijd efficiënt. Het contact met ORET waaraan de ON moest meewerken, was niet opgenomen in het contract. - De clausules uit het FIDIC YB met betrekking tot de wijzigingen waren duidelijk. - De aanpak van wijzigingen door de OG en ON was grotendeels proactief. De OG gaf bijvoorbeeld gelijk aan de start van het project aan dat de haven ook geschikt moest zijn voor grotere schepen. Alleen de verdere uitwerking miste vanwege capaciteitsgebrek bij de OG. De ON was wel proactief met de uitwerking. - De waarschuwingsplicht voor de ON van par. 8.3 uit het FIDIC YB speelde <u>geen</u> rol in de wijzigingsprocedure, de impact op de planning is inbegrepen in het wijzigingsvoorstel. De melding of waarschuwing van claims speelt daarentegen wel een rol. - De volgende processen maken deel uit van de VTW-procedure en worden uitgevoerd door ON of OG:	
9. Alvorens de wijziging plaatsvindt, de potentiële impacts beoordelen en een wijzigingsvoorstel opstellen	X
10. Het wijzigingsvoorstel opnemen in een logboek	X
11. De prioriteit van de wijziging bepalen	X
12. Door middel van overleg met alle relevante partijen een selectie maken van de meest optimale wijzigingsopties.	X
13. De impacts van de verschillende wijzigingsopties bepalen	X
14. (Snelle) besluitvorming over het wel of niet accepteren van de wijziging door iemand die daarvoor bevoegd is.	X
15. Het besluit communiceren naar alle teamleden wiens werk door de wijziging wordt beïnvloed.	X
16. Adequate documentatie van alle genomen beslissingen tijdens het wijzigingsproces.	X
5. De uitvoering van de wijziging monitoren en documenteren.	X
Opmerkingen: Bij 14, de snelheid van de besluitvorming hangt af van de duidelijkheid over de impact, de medewerking van de ON over de financiële consequenties en de goedkeuring van ORET.	
Continu verbeteren	
- Tijdens het project werden er <u>geen</u> 'lessons learned' gecreëerd voor wijzigingen. Misschien hebben ON en ENG dit wel intern gedaan. Vanwege de claims werd deze kennis <u>niet</u> gedeeld. - De performance van de risico management processen werden tijdens het project <u>niet</u> gemeten en bijgestuurd.	
Overige systemen of processen	
Er zijn <u>geen</u> andere systemen of processen dan die al waren gegeven (zie laatste pagina), die relevant geweest zijn tijdens het project voor een efficiënt en effectief wijzigingsproces.	

4. Antwoorden op de extra interviewvragen over 'vertrouwen' en 'wijzigingen' (losstaand van het project)	
Rangschikking van meest effectieve systemen of processen voor het creëren en behouden van vertrouwen tussen OG en ON (C = in contract opnemen en IC = indirect in contract opnemen):	
C	14. Gedeelde projectdoelen
C	15. Betrouwbaarheid persoon: track record, reputatie, competenties (financieel, technisch)
	16. Redelijk gedrag
C	17. Eerlijke/proportionele risicoverdeling
IC	18. Problemen oplossen op het eerste niveau
IC	19. Duidelijk communicatiesysteem
IC	20. Samen problemen oplossen
	21. Betrouwbaarheid: cultuur, beleid
IC	22. Veel communicatie en interacties
	23. Emotionele investeringen
	24. Systeem voor continu verbeteren van de relatie
C	25. Betrouwbaarheid organisatie: track record, reputatie, competenties (financieel, technisch)
Rangschikking van meest belangrijke systemen of processen voor een effectief en efficiënt wijzigingsproces (C = in contract opnemen en IC = indirect in contract opnemen):	
C	9. Gedeelde projectdoelen voor wijzigingenbeheer en risico management
	10. Vroegtijdige waarschuwingsplicht
	11. Risico management systeem
C	12. Eerlijke/proportionele risicoverdeling
C	13. Duidelijke wijzigingsprocedure en rollen/verantwoordelijkheden hierin
	14. Standaard processen: beoordelen potentiële impact, bepalen prioriteit, wijzigingsopties, beoordelen impact, besluitvorming, besluit communiceren, wijziging monitoren
	15. Adequate documentatie van de wijziging
	16. Leren van wijzigingen en kennis hiervan delen
Invloed vertrouwen op wijzigingsproces	
- De efficiëntie van het wijzigingsproces wordt voor 80% bepaald door het vertrouwensniveau tussen OG en ON. Als er geen of weinig vertrouwen is, moeten er meer middelen (tijd, geld etc.) worden ingezet om een wijziging door te voeren bijvoorbeeld omdat partijen <u>niet</u> willen meewerken aan de wijzigingsvoorstel of omdat partijen het wijzigingsvoorstel met daarin de impact zelf grondig gaan checken om te kijken of deze reëel is. - De effectiviteit van het wijzigingsproces wordt voor 50% bepaald door het vertrouwensniveau tussen OG en ON. Als er geen of weinig vertrouwen is, kan het doel ook bereikt worden maar met veel moeite. Als er veel vertrouwen is, is het makkelijker om een hoger doel te bereiken bijvoorbeeld omdat partijen dan meewerken en meedenken (i.e. vertrouwen op basis van medewerking en kennis). - Doordat er meestal een maximum budget is voor een project, wordt de effectiviteit van het wijzigingsproces tevens beïnvloed door de efficiëntie ervan.	

INTERVIEW REPORT #2P

Interview:	Project Dikkowita Fishery Harbour
Date of interview (DD/MM/YYYY):	24-12-2014
Time:	N/A
Location:	N/A
Interview planned by:	Lonneke Cheung
Date of report (DD/MM/YYYY):	24-12-2014
Validated (DD/MM/YYYY):	24-12-2014

1. Attendees				
Initials	Name	Role/Function	Company	Email
AC	Andrew Cook	Contract specialist	RHDHV	-

2. Answers given to questions regarding 'trust':	
Trustworthiness during procurement	
I was <u>not</u> involved in the procurement of the works.	
Reasonable behaviour	
- The principle of good faith in Sri Lankan law did <u>not</u> have an influence on the behaviours of the Employer, the Engineer and the Contractor. The Contract governed the approach each party took. A dispute would have to have escalated to the local Courts for either party to have relied upon the 'good faith' argument. In addition it would be difficult to have shown either Party had not acted in 'good faith'. - According to the Particular Conditions clause 3.1, the Engineer must act reasonably. This clause did have an influence on the behaviour of the Engineer. The Engineer acted 'reasonably' in all situations in my opinion, there was no suggestion otherwise. - There were no clauses (explicit or implicit) for the Employer and the Contractor in the Contract which stated that they must act reasonably. There were no express provision to my knowledge, implied terms typically relate to statute or would be required to ensure the contract operated as intended. - Regarding confidence in the other's behaviour: Generally the Parties were confident in the other side's ability to perform, what contractual issues that did arise were dealt with within by applying the contract. There will always be differences of opinion as to how it should have been applied however. - Regarding collaboration: There was a general willingness to move the project forward on all sides, whether this constituted true collaboration is doubtful. In many cases it was the parties fulfilling the obligations under the contract.	
Project objectives	
- The Employer, the Engineer and the Contractor did comply with the final scope agreement. I would say the amended scope was achieved. - Regarding the Employer's and the Contractor's own objectives: I cannot say whether the Contractor made the profit margins they expected, however they were never in competition so their price could already have been inflated from day one. I doubt either party actually believed they had a 'win-win' situation as the Employer did not get the completed project (the bridge to the site was not constructed). It was a 'partial win-win'. - Regarding 'fitness for purposes' (clause 4.1 in the FIDIC YB): 'Fitness for purpose' clauses are intended to place an increased duty on the contractor where they are undertaking the design and construct role. It is always a point of contention in my experience, the Employer / Engineer uses it to argue for a 'higher' standard to be achieved (a kind of gold plating clause) whereas the Contractor will normally state an item of work is 'fit for purpose' once it functions correctly and a meets the ER's. Under a typical D&C contract the ER's would specify that concrete will have a design life of 'x', withstand loads of 'y' and meet design codes 'z' once constructed and installed it is 'fit for purpose' whereas the Employer/Engineer will tend to push for more. I have used the 'bowl of fruit' metaphor to describe this in the past, the Employer has asked for a bowl of fruit and is expecting apples, oranges, grapes, bananas, kiwi fruit, pears, grapefruit, pineapples etc. but only gets one apple, one banana and a pear.....technically it's a 'bowl of fruit' but it's not what the Employer was expecting so they keep pushing for more saying it's not fit for purpose but the Contractor resists saying they have complied. - Regarding errors in the Employer's Requirements (letter of tender, clauses 5.1 and 1.9 in the FIDIC YB): In my opinion it was clear who was responsible for errors in the Employer's Requirements. It won't stop the parties from arguing about it though. - The Employer, the Engineer and the Contractor did <u>not</u> make agreements regarding the relationship. I don't recall explicit agreements regarding how the parties should treat each other. There will always be personality clashes on projects where people do not get on, on Dikkowitta the Contractor's contracts manager was eventually moved on as he was seen as being obstructive to moving things forward.	
Communication	
- I do <u>not</u> know if the Employer, the Engineer and the Contractor complied with the communication and information plans during the project. I was only involved as the claims came in so can't comment on the process used for communication, what I did see seemed to work very well. - I do <u>not</u> know why the periods of reply and the deemed acceptance were amended or added to the communication procedure and if the Employer, the Engineer and the Contractor complied with these. It is fairly common for these dates to slip but as long as they are not ignored completely the contract will still function. They may qualify as technical breaches but only of procedure, the contract is not unduly affected. - I do <u>not</u> know why clause 3.1 was amended. As a result, the Engineer has full authority to sign documents on behalf of the Employer. It appears to have been part of the negotiations at the setting up of the project, I can only assume it was intended to facilitate the flow of information. - Regarding informal contract between the Employer, the Engineer and the Contractor: There will always be informal channels of communication on projects, ad-hoc meetings and phone calls happen every day, they are usually used to ensure the 'formal' processes are kept to.	

Problem-solving - Regarding the clauses 2.5 and 20 in the FIDIC YB related to claims: The process itself was generally followed, notification and record keeping etc. However, as with most projects timelines tended to drift once the 'claim' was notified. Invariably the Contractor seeks to extend the process until they have a better idea of the full impact of the claim rather than try and move things forward. - I do <u>not</u> know why the last paragraph of clause 20.4 was amended. As a result, that the DAB's decision is always binding and effective until finally settled by arbitration. The Contract was in place before my involvement so I had no influence over the contract amendments. However, we never reached the situation of requiring the DAB to form. - Regarding the Engineer's impartiality: I don't recall there being any accusations of the Engineer not be 'impartial' when undertaking his duties under 3.1. It is interesting that this amendment was made; the 1999 Editions of FIDIC removed the 'impartial' Engineer which was the case under the earlier forms. The industry recognized that the Engineer by being paid by the Employer was hardly likely to be impartial when he was called to determine issues in which he may have been involved at some level. This situation can still occur where the Engineer is also the same organization that undertook the design. - I don't think the claims in themselves influenced the level of trust between the Parties, there was the normal frustrations that all projects encounter i.e. information issued late, people not doing what they said they would do etc. - Regarding solving problems by amicable agreement: The claims reached a stage where the Parties had stated their positions but neither wanted to take the claims to DAB or full Arbitration, the compromise was a negotiated agreement where programme and cost matters were agreed and a contract addendum signed. The intent was to move the project forward rather than get caught up in protracted claims procedure. - All problems were resolved by amicable agreement. The contract addendum did help move things forward initially but other issues came along near the completion of the project that was not part of the initial negotiations (Access Bridge being the main item). The 'new' issues were attempted to be resolved under the Contract procedures but by then both Employer and Contractor had become entrenched in their positions again. The process did involve a degree of 'escalation to management' both formally and informally, this was only partially successful.
Risk allocation - The risk allocation between the Employer and the Contractor in the contract was clear. The main risks carried by the Employer were all adequately allocated in the conventional manner (17.4 being the obvious location). - I was not involved in the drafting of the Contract, however the risk allocation seems to follow normal FIDIC method of allocation i.e. it is allocated to the Party best placed to manage it (if you have not already done so the Abrahamson Principles and the Rimmer Report may both be of interest for wider reading or reference material). Clause 17.6 was amended to reduce the Contractors liability, this is not uncommon and contractors will normally be required to reduce their exposure either as company policy or through instructions by their insurers. - The Employer and the Contractor did not share any risks in terms of liability. I don't recall there being any risk sharing process as such, I may be wrong though (it has been a few years now since I worked on the project). - I do <u>not</u> know if the Contractor received a reward for carrying the risk. - Regarding the combination of D&B and re-measurable quantities: It is unusual to have a mix of Lump Sum and Re-measurable work under the YB, it is not completely unknown and the YB does allow this. I think that this amendment was at the request of the Contractor as they were part of the original negotiation process with ORET and the client. They also produced the Price Schedule, this was not done by RHDHV or the Employer so it may also have been driven by this.
Continuous improvement of the relationship - Other than the process of reaching a negotiated settlement to resolve the impasse regarding the claims I don't recall their being any formal process to improve the relationship between the Parties. Day to day contact was maintained and business-like as is normal, there was some socializing outside of work but this is normal on international projects involving expat staff. - The Employer and the Contractor did <u>not</u> agree on a system or on certain measures for the purpose of improving their relationship during the project.
Other systems or processes There were <u>no</u> other systems or processes than the ones that were already given (see last page) which are relevant for building and sustaining trust between the Employer and the Contractor in this project. I got involved when the claims had advanced to a position where the Parties wanted to move on and avoid the cost and time of formal claims procedure (albeit both reserving their rights under the Contract) hence the negotiated settlement on the claims up to that point. To achieve this there has to be a degree of 'trust' between the Parties for it to work, it helps to have external input from the Engineers and Contractors organizations to facilitate this as the site teams can be too close to the problems that have occurred.
3. Answers given to questions regarding 'changes':
Project objectives - Outside of the normal procedures for Variations under the Contract I do not recall there being any process by either the Contractor or Employer to align their respective project objectives with the change management process under the Contract. - The Employer and the Contractor did not align objectives with regard to risk management. The contract procedures were applied.
Risk management - The Employer, the Engineer and the Contractor did comply with these risk management plans during the project. From memory, the risk plans / register approach worked well in recording and monitoring project risks. - All Parties took a proactive approach to risk management; I would say that the Parties were 'largely proactive'. The real issue is when a risk is identified that carries a significant cost or time impact (or both), the Parties natural reaction is to pass it on or try to avoid ownership. This is where contract procedure and the Parties willingness to deal with the issue are tested. - Risk management did <u>not</u> play a role in the change management procedure. On projects of this nature (marine civil engineering) the change / variations will tend to occur in the obvious locations i.e. the physical works, the ground conditions, the weather etc. these can be dealt with under the normal contract mechanisms.

Change management procedure	
▪ Regarding the deviations from the standard variations procedure in the FIDIC YB: It is not unusual for the Employer to impose a monetary limit on the Engineer as regards the value he can instruct under the contract, many employers do this. From experience this can lead to a significant slowing down of the procedure for agreeing variations as invariably questions are asked internally by the Employer as to the validity of the variation or instruction. Meanwhile the Contractor is left in a kind of limbo. ▪ The Employer, the Engineer and the Contractor did comply with the variation procedure used. The Parties did comply and follow procedure initially, however it tended to drift a little after the initial notification (this is not uncommon). ▪ The processes, the roles and responsibilities, and the type of variations claimable were clear in FIDIC YB. On projects of this nature (marine civil engineering) the change / variations will tend to occur in the obvious locations i.e. the physical works, the ground conditions, the weather etc. ○ The change management approach by the Employer, the Engineer and the Contractor during the project was half reactive/half proactive overall. As with any project of this type, you are expecting variations to occur from day 1 so it is not surprise when they do occur. It can become a problem if they are predominately from one or two main areas e.g. design based, ground conditions etc. ○ The early warning obligation (clause 8.3 in the FIDIC YB) could play a role in the variations procedure. Only in as much as it was raised by the Contractor when an event occurred, I do not recall there being 'early warning' meetings as such as per NEC3 approach. ○ Other early warning clauses in the FIDIC YB: Clauses 1.8, 4.20, 4.24, 7.3, 17.4, 18.1 each contain a requirement on one or both Parties to '...promptly give notice...' to the other, whether this can be interpreted as a true 'early warning' in the context of the NEC3 approach is debatable in my view. Other than 17.4 I do not recall the above clauses being required during the project (I could be wrong but I am working from memory rather than actual records). ▪ The following processes are included in the change management system and are performed by the Employer, the Engineer or the Contractor:	
9. Before the change takes place, assess potential impact and create a proposed change order	X
10. Document the proposed change in a log	-
11. Determine priority of the change	-
12. Selection of optimum change options by consulting all relevant parties	X
13. Identify the likely impacts of different change options	X
14. (Prompt) decision making as to whether to accept/reject the change by someone with authority	X
15. Communicate final change decision to all team members whose work is affected by it	X
16. Appropriate documentation to record all decisions within the change process	X
5. Monitor and record implementation of the change	X
▪ Remarks: I would only state that the process is normally lead by the Contractor as the initiating party after they either encounter a changed circumstance or react to new information.	
Learning from changes	
▪ The Employer, the Engineer and the Contractor did <u>not</u> create 'lessons learned' from variations during the project. ▪ The Employer, the Engineer and the Contractor did <u>not</u> measure the performance (efficiency and effectiveness) of the risk management processes during the project.	
Other systems or processes	
▪ There are <u>no</u> other systems or processes than the ones that were already given (see last page) which are relevant for creating an efficient and effective change management process in this project. As mentioned my involvement was limited to assisting with the claims so I did not get involved with the day to day management processes.	

4. Answers given to extra questions regarding 'trust' and 'changes' (irrespective of the project)	
Ranking of the most effective systems or processes for building and sustaining trust between the Employer and the Contractor (C = include in the contract, IC = indirectly include in the contract):	
	N/A
Ranking of the most important systems or processes for an effective and efficient change management process (C = include in the contract, IC = indirectly include in the contract):	
	N/A
Influence trust on change management process	
	N/A

INTERVIEW REPORT #1

Interview:	FIDIC Control Group for Project Dikkowita Fishery Harbour
Date of interview (DD/MM/YYYY):	24-11-2014
Time:	N/A
Location:	N/A
Interview planned by:	N/A
Date of report (DD/MM/YYYY):	24-11-2014
Validated (DD/MM/YYYY):	24-11-2014

1. Attendees				
Initials	Name	Role/Function	Company	Email
GH	Geert Hendriks	FIDIC Expert/ FIDIC Engineer	RHDHV	-

2. Answers given to questions regarding 'trust':	
Trustworthiness during procurement	
N/A	
Reasonable behaviour	
- The principle of good faith in the laws may have an influence on the behaviours of the Employer, the Engineer and the Contractor. It depends very much on the type and attitude of both Employer and Contractor. Some Clients are known to be very strict and to the letter of the contract, which can "bite" with the principle of "acting in good faith". On the other hand, Contractors can be very "claim conscious" as well and some contractors are even known to be "unscrupulous". In reality, the principle of reasonable behaviour is certainly the way how parties should work together and how the contract is being set up. In reality, I believe it is often not so easy. The interests and the importance of the projects are often too high and all parties must defend their ground as good as they can. I do however think that in case of litigation or arbitration there is certainly an element of reasonable behaviour that comes into play when reaching a judgment by the Court. - The FIDIC YB does not really contain clauses which explicitly or implicitly state how the parties should act (e.g. reasonable and fair). There is however a Clause 20.5 Amicable Settlement.	
Project objectives	
'Fit for purposes' is an achievable objective, but it must be stated, at the tender, clearly what the Employer needs. To this end, there will be a specific document in the tender package, named the Employer's Requirements, sometimes supplemented by (definition) drawings. In these documents, it will be very clearly described what the client requires in terms of infrastructure, design codes, level of finishing and other performance specifications etc. - It is clear who is responsible for errors in the Employer's Requirements (ER). Formally, the Employer is of course responsible for the accurateness of what he is asking for. The fact that he may have a consultant who made the ER for him does not change this fact.	
Communication	
- In general, Contractors do adhere to the clauses 1.3 and 4.21 regarding formal communication and progress reports in the FIDIC YB and the Engineer will see to it. - In the Dikkowita project, the full authority for the Engineer to act on behalf of the Employer could potentially lead to problems, but the Engineer must use this Clause wisely and not instruct matters to the Contractor that involve additional time or costs or which would alter the scope of the works without explicit agreement from the Employer.	
Problem-solving	
- The clauses 2.5 and 20 regarding claims in the FIDIC YB can lead to problems. A current contract in Romania is facing numerous problems where the Contractor wishes to set up a DAB, but where the Employer does not want to acknowledge the nominated DAB person or outcome, since they know it will not turn out in their favour. - The Engineer's impartiality may cause problems in the claims procedures. To put it simple: sometimes the Engineer makes an impartial determination which is against the Employer and this will of course lead to friction. - Claims do have an influence on the trust level between the Employer, the Engineer and the Contractor. Claims will often bring a lot of tension and mistrust to the table. - In the Dikkowita project, clause 20.4 in the FIDIC YB was probably amended due to efficiency. The DAB is of course nothing more than a panel of wise men giving their professional opinion. The outcome of the DAB is therefore not "legally" binding. It is more an instrument to prevent a long and expensive battle in Arbitration of Litigation (court) which often makes nobody happy.	
Risk allocation	
- In general, the risk allocation between the Employer and the Contractor in the FIDIC YB is clear. That is the advantage of having a standardized contract form such as FIDIC. - The risks in the FIDIC YB are not necessarily allocated to the party best able to manage these. Some risks such as ground conditions cannot be foreseen by the Contractor too. The point is basically that certain risks are being transferred to the Contractor at a certain price. The contractor will factor in these risks and ask a premium for it in his rates and prices. - About the amendment of clause 14.1 regarding the re-measurable quantities in the FIDIC YB in the Dikkowita project: This was specific for Dikkowita since the project was funded through a grant of the Dutch government. In this grant there is no possibility to exceed the contract sum, while the contractor did not want to take full risk on lump sum for some items (for example: dredging works). This is not a standard solution, especially not cutting down the scope to make sure the contract sum is not exceeded.	
Continuous improvement of the relationship	
N/A	
Other FIDIC clauses	
There are no other FIDIC clauses which are important for building trust between the Employer (and Engineer) and the Contractor. In general, it all depends on the attitude of all parties. Trust is not a requisite, but hopefully something that develops during construction.	

3. Answers given to questions regarding 'changes':
Project objectives
▪ N/A
Risk management
▪ N/A
Change management procedure
▪ The variations procedure stated in clause 13 in the FIDIC YB efficient and effective. It is adequate in my view. ▪ The processes, the roles and responsibilities, and the type of variations claimable are clear in the FIDIC YB. ▪ The early warning obligation stated in clause 8.3 in the FIDIC YB does not really play a role in the variations procedure. ▪ There are no other early warning clauses in the FIDIC YB.
Learning from changes
▪ N/A
Other FIDIC clauses
▪ There are no other FIDIC clauses which are important for creating an efficient and effective change management process.

INTERVIEW REPORT #2

Interview:	FIDIC Control Group for Project Dikkowita Fishery Harbour
Date of interview (DD/MM/YYYY):	08-12-2014
Time:	N/A
Location:	N/A
Interview planned by:	N/A
Date of report (DD/MM/YYYY):	08-12-2014
Validated (DD/MM/YYYY):	08-12-2014

1. Attendees				
Initials	Name	Role/Function	Company	Email
BB	Berend van Bon	FIDIC Expert/ FIDIC Engineer	RHDHV	-

2. Answers given to questions regarding 'trust':	
Trustworthiness during procurement	
N/A	
Reasonable behaviour	
- The principle of good faith in the laws does <u>not</u> have an influence on the behaviours of the Employer, the Engineer and the Contractor. In general I would say that all people should be called upon their obligation to behave reasonably. The weakness of this principle lies in the problem that everybody has a different view on what is reasonable. Reasonable behaviour may also change from country to country, or should I say from culture to culture. I once worked in another European country where my colleagues insisted that contractors were allowed to cheat and they found that quite reasonable, whereas from my cultural background cheating is always unreasonable. 'Good faith' and 'reasonable behaviour' is therefore highly subjective and in an international contract environment quite useless. If called upon, it will only have meaning in front of an adjudicator or judge, who then has to decide what is reasonable and if the parties have acted in 'good faith'. - The FIDIC YB does contain several clauses that call upon reasonable behaviour of the contract parties: - Clause 2.2 calls for the Employer's reasonable assistance to the Contractor in obtaining permits, licences and approvals. - Clause 2.4 calls for the Employer to provide reasonable evidence that he has financed the project properly and is capable of paying the contractor. Both parties have to act reasonable in the judgment about what is reasonable evidence here. - Clause 3.5 Engineer's Determinations is probably the most crucial clause that calls upon reasonable behaviour of all parties. In case of any issue or claim that needs an Engineer's Determination it is essential and obligatory that consultation with each party shall take place "in an endeavour to reach agreement". In case of claims and differences of opinion the Contract therefore always calls for finding agreement and that can only be achieved when parties behave reasonable. If this consultation fails, only then the Engineer is obliged to take a decision on the matter. But the same clause specifies again that this shall be "a fair determination in accordance with the Contract". - Also in the obligations of the Contractor (Clause 4), the Contractor is called several times to behave reasonable in the execution of his works, e.g. sub-clauses; 4.7, 4.12, 4.14, 4.15 and 4.18.	
Project objectives	
'Fit for purposes' is always and should be an achievable objective. But because the statement itself can be interpreted subjectively, the Employer's Requirements should precisely specify what the Employer's understands to be "fit for purpose". This is a matter of writing good Employer's requirements. - It is clear who is responsible for errors in the Employer's Requirements (ER). The Employer is responsible for it. If the Employer has asked a consultant to write the Employer's Requirements he will of course complain to the consultant, but that is not a matter relevant to the Works contract.	
Communication	
- In general, Contractors do <u>not</u> adhere to the clauses 1.3 and 4.21 regarding formal communication and progress reports in the FIDIC YB. Contractors are not always very precise in their formal communications. Progress Reports are often not taken very seriously and contractors try to get away with quickly drafted and shoddy reports. It happens often that Engineers first have to reject progress reports and instruct what should be in them before reasonable reports are produced. Even in the case of claims contractors can be imprecise, sometimes to their disadvantage. - In the Dikkowita project, the full authority for the Engineer to act on behalf of the Employer could potentially lead to problems. It is not usual that the Engineer gets full authority to act on behalf of the Employer. The Engineer should not even want that for his own protection. It is usual to specify in the Particular Conditions a minimum set of criteria where the Engineer has to ask approval from the Employer before issuing any instruction to the Contractor. The following is an example of such limitation of the Engineer's authority. Further, it is always good practice to keep the Employer closely involved in all matters and progress of the Works. Sub-Clause 3.1 is usually modified in the Particular Conditions in the following way, with more or less sub clauses specified for which Employer's approval is required: "Add at the end of Sub-Clause 3.1 the following: The Engineer shall obtain the specific approval of the Employer before taking action under the following Sub-Clauses of these Conditions: - Sub Clause 3.5: agreeing or determining any matter, which will increase the Contract Price; - Sub Clause 4.4: giving consent to a Subcontractor (Supplier) for a subcontract for which a different subcontractor (material/equipment) is named in the Contract; - Sub Clause 5.2: approving the Contractor's Documents (the design). - Sub Clause 8.4: agreeing or determining an extension of the Time for Completion;	

○ Clause 13: instructing a Variation which is expected to increase the Contract Price or in any substantial way change the scope, character or quality of the Works. ○ Sub Clause 13.5: giving instructions for the use of the provisional sums”.
Problem-solving
▪ The clauses 2.5 and 20 regarding claims in the FIDIC YB work well in principle, although there are two aspects that could be defined sharper. In Sub-Clause 2.5 the Employer should give Notice of a claim “as soon as practicable after becoming aware”. This is not specific enough and it can be interpreted at will what “as soon as practicable” is. Something similar applies to Sub-Clause 20.1. Although a Notice to a claim should be given by the Contractor within 28 days, failing which the Contractor loses his entitlements to Extension of Time and/or costs. However, for submitting his full claim the Contractor has 42 days but without consequence if he fails to do so. In practice contractors submit their full claim even months after the claim event has occurred, putting Engineer and Employer at a disadvantage to study the actual claim properly, and thus holding them at ransom about the consequences of the claim. ▪ The Engineer is <u>not</u> impartial. He is paid by the Employer and is by contract supposed to act on behalf of the Employer, see Sub-Clause 3.1. However, as a good advisor to the Employer he has to advise also clearly and correctly when the Employer is in the wrong. In case of determinations he is supposed to decide fairly to both parties and in accordance with the Contract. Yes, no matter how sincere the Engineer tries to be, in case of disputed claims, the Engineer is often accused by either party not to be fair or not doing his job properly. ▪ Claims do have an influence on the trust level between the Employer, the Engineer and the Contractor. In case of disputed claims, tempers do flare and trust between parties are sometimes destroyed. The challenge in such circumstances is to stay cool and composed and to keep acting in a professional manner. ▪ In the Dikkowita project, clause 20.4 in the FIDIC YB was amended. The effect of the amendment is that the period for filing a ‘Notice of Dissatisfaction’ was removed. Personally I do not find this an improvement, it means that one of the parties can always file such a notice at any moment also at a date much later than 28 days after the decision of the DAB. In that way such disputes can remain endlessly in limbo before becoming binding. The parties should make up their minds within 28 days whether they are dissatisfied with a DAB decision or remain silent thereafter.
Risk allocation
▪ In general, the risk allocation between the Employer and the Contractor in the FIDIC YB is clear and divided properly. ▪ The risks in the FIDIC YB are allocated to the party best able to manage these. ▪ About the amendment of clause 14.1 regarding the re-measurable quantities in the FIDIC YB in the Dikkowita project: Without knowing the exact nature of the Contract it is difficult to assess the rationale of this change. In general it is not wise to change this Sub-Clause in this way. It is apparent that the Contract contains many measurable items that warrant even a Bill of Quantities. But this is a payment structure that belongs to a FIDIC Red Book contract and if this is what is wanted, then the Employer should have prepared the design himself and tender the whole contract under the FIDIC Red Book. To mix the two forms in this way indeed creates a risk that the Contractor may abuse the situation to his advantage.
Continuous improvement of the relationship
▪ N/A
Other FIDIC clauses
▪ There are no other FIDIC clauses which are important for building trust between the Employer (and Engineer) and the Contractor. The FIDIC is not meant to create trust, just to set rules how the three parties, Employer, Engineer and Contractor, should engage with each other in a contracting environment. Trust will be created if all three parties execute their jobs sincerely and conscientiously, in accordance with the contract.

3. Answers given to questions regarding ‘changes’:
Project objectives
▪ N/A
Risk management
▪ N/A
Change management procedure
▪ The variations procedure stated in clause 13 in the FIDIC YB efficient and effective. It is an often used and successful procedure. ▪ The processes, the roles and responsibilities, and the type of variations claimable are clear in the FIDIC YB. ▪ The early warning obligation stated in clause 8.3 in the FIDIC YB has no relation to the Variation procedure of Clause 13. The Contractor is urged to warn the Employer and Engineer if he foresees circumstances that may jeopardise his Work Programme. This may lead, depending on the nature of the circumstances, to a claim for extra time and costs. Such additional costs may be subject to a Variation Order again. But in principle there is no direct relation. ▪ There are no other early warning clauses in the FIDIC YB.
Learning from changes
▪ N/A
Other FIDIC clauses
▪ Other FIDIC clauses which are important for creating an efficient and effective change management process: Clause 8 (Commencement, Delays and Suspension is an important clause for dealing with changes in the work programme).

INTERVIEW REPORT #3

Interview:	FIDIC Control Group for Project Dikkowita Fishery Harbour
Date of interview (DD/MM/YYYY):	16-12-2014
Time:	N/A
Location:	N/A
Interview planned by:	N/A
Date of report (DD/MM/YYYY):	16-12-2014
Validated (DD/MM/YYYY):	16-12-2014

1. Attendees				
Initials	Name	Role/Function	Company	Email
RB	Rob Brouwer	FIDIC Expert/ FIDIC Engineer	RHDHV	-

2. Answers given to questions regarding 'trust':	
Trustworthiness during procurement	
N/A	
Reasonable behaviour	
- The principle of good faith in the laws does have an influence on the behaviours of the Employer, the Engineer and the Contractor, as I see on various projects that the legal fall-back position is seriously taken into account when assessing Contractor's claims. In general I observe that Employers and Engineers seem to act more in good faith while Contractors do this more in 'second instance' only. The market seems in general to accept that Contractor over-claim in hope that after a 'settlement' a fair result remains. - The FIDIC YB does contain clauses which explicitly or implicitly state how the parties should act (e.g. reasonable and fair), but it is far weaker than in old FIDIC contract forms (prior to 1999) when the Engineer was at least to act fair and impartial. Now only Clause 3.5 Determinations states that the Engineer shall make those fair with due regards to all circumstances. And of course Clause 20.5 talks about amicable settlements. In the clauses about disputes the word 'reasonable' also occurs a few times.	
Project objectives	
'Fit for purposes' is an achievable objective in practical terms, but in a legal sense it is very difficult.. It puts the burden on the drafter of the tender and contract to be very clear on the intended purpose. This often remains contentious. The practice of adding many clauses in special conditions or technical specifications to cater for all kinds of (design and construction-) risks is especially dangerous as it often leads to conflicting or seemingly conflicting requirements. - It is clear who is responsible for errors in the Employer's Requirements (ER). The Employer is responsible for it. Clause 5.1 is an attempt to ensure that defects are found early, hopefully before entering in to the agreement. But the burden of writing a fault free tender or contract remains in most jurisdictions on the party that is primarily responsible for writing the document according to the legal doctrine of 'contra preferentem'.	
Communication	
- In general, Contractors do adhere to the clauses 1.3 and 4.21 regarding formal communication and progress reports in the FIDIC YB (at least after some motivational action). If he does not adhere, then it is easy for the Engineer to deduct payments. Monthly reports are a precondition for payment of interim valuations. - In the Dikkowita project, the full authority for the Engineer to act on behalf of the Employer could potentially lead to problems. The particular condition makes life of the Engineer easier and seems a copy from general conditions in older versions of FIDIC. But hardly any Employer nowadays will accept such clause, as it put him in danger of cost overruns.	
Problem-solving	
- The clauses 2.5 and 20 regarding claims in the FIDIC YB do not work well on all projects because the quality of the DAB sometimes proves to be poor. - According to the GCC the Engineer is not 'impartial'. Of course both Employer and Contractor know that the Engineer is paid by the Employer. He must make fair determinations but generally he is considered to be biased. Hence the whole idea of adjudication paid by both parties. - Claims should not have an influence on the trust level between the Employer, the Engineer and the Contractor unless they easily prove to be spurious. Claims and especially early warning/notice of possible claims allows the other party to act before things get out of hand. Claims are the only way to deal with unexpected changes. Unfortunately on most contracts parties do consider claims to quickly as unrealistic or unfair and as such they do often reduce trust. - In the Dikkowita project, clause 20.4 in the FIDIC YB was amended. If a decision is binding until overruled, the works can continue or payments can be reconciled or made. Otherwise as long as the decision is not binding yet (not even temporarily) disputes may prevent progress of works or of partial settlement of claims. The change is however not necessary as Clause 3.5 already states that a determination by the Engineer is already effective until possibly changed by the dispute process. To me the change in the Dikkowita contract is an example that people are too eager to add or change to the Conditions of contract. This makes them dangerous to both contractual parties because they can be easier misunderstood or overlooked.	
Risk allocation	
- In general, the risk allocation between the Employer and the Contractor in the FIDIC YB is clear. - The risks in the FIDIC YB are allocated to the party best able to manage these. - About the amendment of clause 14.1 regarding the re-measurable quantities in the FIDIC YB in the Dikkowita project: FIDIC YB and remeasurable is uncommon and against the main thrust for using a yellow book. But it will not necessarily put the Employer at a large risk if the Employer's Requirements are well defined.	
Continuous improvement of the relationship	
N/A	
Other FIDIC clauses	

▪ Other FIDIC clauses which are important for building trust between the Employer (and Engineer) and the Contractor: In my modest opinion all clauses in the Contract are there to regulate things well and to enable trust to be established between the parties.

3. Answers given to questions regarding 'changes':
Project objectives
▪ N/A
Risk management
▪ N/A
Change management procedure
▪ N/A
Learning from changes
▪ N/A
Other FIDIC clauses
▪ N/A

INTERVIEW REPORT #4

Interview:	FIDIC Control Group for Project Dikkowita Fishery Harbour
Date of interview (DD/MM/YYYY):	06-01-2015
Time:	N/A
Location:	N/A
Interview planned by:	N/A
Date of report (DD/MM/YYYY):	06-01-2015
Validated (DD/MM/YYYY):	06-01-2015

1. Attendees				
Initials	Name	Role/Function	Company	Email
AT	Arco van der Toorn	FIDIC Expert/ FIDIC Engineer	RHDHV	-

2. Answers given to questions regarding 'trust':	
Trustworthiness during procurement	
N/A	
Reasonable behaviour	
- Regarding the question if the principle of good faith in the laws has influence on the behaviours of the Employer, the Engineer and the Contractor: This is hard to answer in a general manner. I am not a contract lawyer but a Civil Engineer. In every civilized country the laws and regulations related to contract execution may include general provisions to common legal principles concerning correct behaviour and good faith. Fidic RB and YB article 20 Claims, Disputes and Arbitration is dealing with everything what is at stake in case the contract is not leading to clear answers. For these questions the following documentation forms the Contract and are listed in the order of their priority: - The contract agreement (if any); - The letter of acceptance; - The letter of Tender; - The Particular Conditions; - These Fidic General Conditions. So it is not sufficient to investigate only the Fidic General Conditions of Contract (GCoC) (either YB or RB) related to not specific human or ethical behaviour. Other documents in the contract chain may incur bad influence as well. - The FIDIC YB does not contain clauses which explicitly state how the parties should act. I am not aware of any specific clause of the GCoC which is dealing with good faith under FIDIC. I recall that World Bank and EIB have included specific items related to ethical behaviour, transparent tendering and procurement procedures and tender evaluation behaviour and prevention of influencing/ corruption.	
Project objectives	
'Fit for purposes' is an achievable objective. When signing the contract the Contractor has accepted the general description of the works from design up to end of the defects liability/ notification period. In case of unclear wording, this should have been notified by the Contractor during the tendering stage (questions before submission or by issuing reservations in his bid) or within the first 28 days (before issuing the Letter of Acceptance). - It is clear who is responsible for errors in the Employer's Requirements (ER). The Employer as contract party is responsible for (obvious or hidden) errors in the ER.	
Communication	
- Regarding the clauses 1.3 and 4.21 (formal communication and progress reports): The content and subjects required in Contractor's progress reporting may be further detailed in the Particular Conditions of Contract (PCC) if deemed necessary by the Employer. Without formal additional requirements, the Engineer may set terms and procedures for proper communication based on his interpretation of the contract and project requirements. So: no general answer can be given, this is different in each and every project. However, most contractors are not good in report writing, but excellent in detailed specification of their Interim Payment Certificates (IPC's) or variation requests. - In the Dikkowita project, the full authority for the Engineer to act on behalf of the Employer does not lead to problems. I would consider the amendment of Engineer's duties under Fidic YB as instrumental for a proper contract execution. But the Engineer shall not take over the design responsibility of the Employer. It is the other way around. Problems may arise when the Employer is restricting in the PCC the duties of the Engineer. Problems with approvals for design under FIDIC YB are likely to happen in case the existing local approval procedures for designs and construction permits are in majority compliant with a an approval procedure for Design by Employer (i.e. re-measured contract (Construction RB)).	
Problem-solving	
- The clauses 2.5 and 20 regarding claims in the FIDIC YB do not work well. Based on my personal experience, the Engineer's determination is not always respected by both parties. But in 2 projects in Poland this worked much better than 2 projects in Romania. So this is partially due to specific choices made by the Employer and the Contractor and specific clauses in PCC's on the individual project. - The Engineer's impartiality can cause problems in the claims procedures. In Romania the independent authority of the Engineer was questioned by the Contractor. - Claims do have an influence on the trust level between the Employer, the Engineer and the Contractor, but this should not be the case. A claim is an integral part of the contract in order to settle deviations which became apparent during contract execution and are related to extension of time of completion and/ or any additional payment. The timing, motivation of the claim and the number of claims issued by the Contractor may influence the trust level between Employer and Engineer at one side and the Contractor at the other. - In the Dikkowita project, clause 20.4 in the FIDIC YB was amended. The removal of the last paragraph (notice of dissatisfaction) of clause 20.4 may be introduced in order to avoid endless filing of notices by the Contractor. However, I think this amendment	

of clause 20.4 was not sufficient. Notices of dissatisfaction may be filed by either party earlier than the situation mentioned under the last paragraph of clause 20.4.
Risk allocation
- Regarding the clarity of the risk allocation between the Employer and the Contractor in the FIDIC YB: All contracts contain risks. FIDIC allocates responsibilities on basis of the principle "Party best able to manage a risk". Parties should carefully study the General and Particular Conditions to understand responsibilities and risks. So no general answer can be given, it is dependent on the manner parties are executing the specify duties and the way they play their roles. - The risks in the FIDIC YB are allocated to the party best able to manage these. With regard to risk mitigation, the YB is in the middle between RED Book and Silver Book. - About the amendment of clause 14.1 regarding the re-measurable quantities in the FIDIC YB in the Dikkowita project: It is true that re-measured quantities may incur risks for the Employer. But this is only the case when the Employer's Requirements are not complete or insufficient or in case the provisional sums are not sufficient. So this depends on the specific clauses of the PCC dealing with re-measured quantities.
Continuous improvement of the relationship
N/A
Other FIDIC clauses
- There are no other FIDIC clauses which are important for building trust between the Employer (and Engineer) and the Contractor. - The choice of the type of contract is the major factor leading to successful contract execution. Projects in which significant variations are anticipated should be RED Book. - Local Laws. Incorporate provisions of local laws into PCC by the Employer should be done. Fidic guidance notes give general advice but local legal expertise is required. - I like the topic of your thesis. Any Engineer, e.g. a procurement expert or contract management expert has to cope with building a sound relation between two other parties (Contractor and Employer). But FIDIC GCoC is not primarily established to assure a proper contract execution. Its primary goal is to provide general conditions which are cross checked, in order to allow maximum flexibility in preparing the PCC dedicated for the specific project needs. But the quality and completeness of preceding documents may be more important. Other circumstances before the works contract is signed are important as well: i) When the Request for Proposal has already unclear requirements, ii) the Employer refuses to play his role (i.e. in executing pre-designs, provided sufficient financing including financing of variations, completing preparatory works including EIA, land acquisition, etc.) or iii) severe penalty clauses are included in PCC or iv) the role and duties of the Engineer are restricted, v) refuses to answer all questions during tendering properly, then the relation between Parties may be spoiled easily. Fidic cannot repair bad quality of preceding documents in the tendering chain.

3. Answers given to questions regarding 'changes':
Project objectives
N/A
Risk management
N/A
Change management procedure
- The variations procedure stated in clause 13 in the FIDIC YB efficient and effective. Again, this is mainly dependent on the way the Engineer exercises his duties, the Employer executes his role and the (restrictions of the) authority of the Engineer stipulated in the PCC and the format of the Schedules of Payments, IPC's, day works, supporting documents, etc. prescribed in the PCC. And of course the way the Contractor is acting. - Regarding the question if the processes, the roles and responsibilities, and the type of variations claimable are clear in the FIDIC YB: This is difficult to answer, as each individual situation I have experienced in Romania there was bad correspondence related to variations, but this was based on specific local circumstances, format and details of the Schedule of Payments, BoQ or IPC's and specific PCC clauses (written by the Employer prior to the commencement of the contract). - The early warning obligation stated in clause 8.3 in the FIDIC YB does play a role in the Variation procedure of Clause 13. Clause 13.2 encourages the Contractor to react when cost saving, time saving or better quality can be achieved. Projects in which significant variations are anticipated should be RED Book. Fidic YB is specifically intended to invite Contractors to expedite its proper design potential, to allow alternative solutions and more efficient building methodology, preferably during the bid preparation stage. - There are other early warning clauses in the FIDIC YB. Clause 5.1 General Design Obligations. Contractor shall give notice to the Engineer of any error, fault or other defect found in the Employer's Requirements or these items of reference, and 4.12 Unforeseeable Physical Conditions (Notice of Contractor).
Learning from changes
N/A
Other FIDIC clauses
- Other FIDIC clauses which are important for creating an efficient and effective change management process: - Clause 3.3 Instructions of the Engineer. Under YB the Engineer may influence the change management process adequately, provided the PCC clauses allow him to do so. Very often the Employer has restricted the duties of the Engineer, which can lead to complicated contract execution. - My personal experience is based on the guidance and project management of mainly EU financed water and environment projects between 1996 and 2009. During that period the EU was enhancing the accession of preaccession states in Central and Eastern Europe (Phare and ISPA programme) and supporting environmental and good governance project in former Soviet republics (TACIS NIS and EIA Balkan programmes). Often co-financing was included by EBRD or EIB and World Bank and specific National Development Aid programs of individual EU member states were present as well. Fidic YB was misused specifically during the ISPA programme (2000-2006) for accelerating project execution. The time required for design stages was reduced by transferring design responsibility from the Employer (conventional National contract conditions similar to Fidic Red Book CoC) to the Contractor (imposing Fidic YB CoC). For instance, many projects in Poland, Latvia and Czech Republic could not be executed under YB, as the procurement laws and building regulations did not allow Contractors to design. In Romania and Bulgaria the

same limitations in building regulations exist, but EU stressed to initiate more works contracts in order to improve environmental conditions, i.e. reduce disposal of untreated waste water, reduction of pipeline leakages and increase number of house connections for drinking water meeting EU guidelines. This abundance of financing and political pressure from Brussels combined with lack of contract management expertise at beneficiaries, in National Agencies and institutions resulted in improper works contract execution and many works contract terminations. Many initially set up YB project were completed under renewed RB CoC projects.

- The circumstances under which investments are done (unrealistic time demands political pressure and driven by environmental needs) and the lack of western European contract management expertise in CEE countries played a much bigger role than the way the FIDIC contract conditions were followed by the parties.

INTERVIEW VERSLAG #5

Interview:	FIDIC Control Group for Project Dikkowita Fishery Harbour
Datum van interview (DD/MM/JJJJ):	11-01-2015
Tijd:	N.v.t.
Locatie:	N.v.t.
Interview gepland door:	N.v.t.
Datum verslag (DD/MM/JJJJ):	11-01-2015
Gevalideerd (DD/MM/JJJJ):	11-01-2015

1. Aanwezigen				
Initialen	Naam	Functie	Bedrijf	Email
RV	René van Voorst	FIDIC Expert	RHDHV	-

2. Antwoorden op de interviewvragen over 'vertrouwen'	
Betrouwbaarheid bij aanbesteding	
N.v.t.	
Redelijk gedrag	
"Good faith" heet in het NL burgerlijk wetboek (BW) "redelijkheid en billijkheid". In het oude BW van voor 1992 heette het de "goede trouw". - M.i. heeft het beginsel van redelijkheid en billijkheid tot op zekere hoogte invloed op het gedrag van de OG, ENG en ON. Echter, naarmate de financiële consequenties van redelijk en billijk gedrag meer geld kosten, zal bij de meeste partijen de mate van redelijkheid en billijkheid in hun gedrag afnemen. Als dat een partij te veel geld kost, kan hij via mediation, arbitrage of een rechtzaak alsnog proberen zijn (redelijke en billijke) gelijk halen. - Overigens, de redelijkheid en billijkheid die voor het contractenrecht van belang is, staat in de boeken 6 en 7 van het BW [7 = o.a. Aanneming van Werk] en dit betreft overwegend aanvullend recht (in tegenstelling tot dwingend recht). Daarom kan er van de redelijkheid en billijkheid van het BW worden afgeweken in eigen administratieve voorwaarden (Conditions of Contract of in de aanvullende Particular Conditions). Dat gebeurt bijna standaard bij Design&Construct-achtige contracten om het aantal risico's voor de opdrachtgever te beperken. Het is voor een aannemer niet verboden om een overeenkomst met onredelijke voorwaarden die de redelijkheid en billijkheid van het BW terzijde schuiven te ondertekenen. - Het FIDIC YB bevat Clausules die voorschrijven hoe de partijen zich moeten gedragen: FIDIC geeft op de zoekterm "good faith" 0 hits, op "reasonable" 51 hits en op "risk" 23 hits. Uit de context van het gebruik van de woorden reasonable en risk blijkt, dat dit steeds een invulling is van de gedachten die schuilgaan achter "good faith". Achter "in good faith" gaat m.i. schuil dat zaken "reasonable" worden afgehandeld en dat risico's zo veel mogelijk worden gedragen door de partij die invloed heeft op het voorkomen van het zich voltrekken van dat risico of niet. De FIDIC geeft dus zonder de woorden "good faith" te gebruiken, wel degelijk invulling aan het begrip "good faith".	
Projectdoelen	
'Fit for purposes' is een haalbaar doel. Als de aannemer ook het "design" moet uitvoeren, is het "Fit for purpose" bouwen een "achievable objective" waar hij zelf invloed op heeft. Het is ook gewoon een harde must, anders zit de opdrachtgever na oplevering met een lekke boot, een lek dak, een verwarmingsinstallatie die het niet goed doet, etc. - Het is duidelijk wie verantwoordelijk is voor de Employer's Requirements (ER). De contractor is responsible door zijn verklaring in zijn letter of tender, tenzij de aard van de fout dusdanig is dat hij "als experienced contractor/designer such error not reasonably could have detected and the delay not could have avoided". In dat laatste geval krijgt de aannemer toegang tot het indienen van een claim voor geld en/of tijd. - Dit is een m.i. zeer een soepele regeling die in moderne Design&Build contracten vervangen is door de kwalitatieve aansprakelijkheid van de aannemer voor alle fouten in het ontwerp van de opdrachtgever.	
Communicatie	
- Over het algemeen houden ONs zich <u>niet</u> aan de Clausules 1.3 en 4.21 m.b.t. de formele communicatie en de voortgangsrapportages uit het FIDIC YB. Mijn ervaring is dat aannemers vaak te laat zijn met hun voortgangsrapportages en dat de rapportages vaak onvolledig zijn. De financiële paragraaf met uitstaande "variations" is meestal wel volledig. Door aan te dringen op aanvulling lukt het meestal wel om uiteindelijk redelijk volledige rapportages te krijgen. Als dat niet lukt, is het raadzaam om de rapportage af te keuren als "niet in overeenstemming met het bestek" - In het Dikkowita project leidt de volledige bevoegdheid voor de ENG om namens de OG te handelen mogelijk tot problemen. De Engineer zit vaak in een spagaat tussen zijn opdrachtgever wiens technische en financiële belangen hij moet behartigen en de soms onredelijke (meestal financiële) wensen van de aannemer. De realiteit is dat het handelen van de Engineer vaak op gespannen voet staan met de woorden "the Engineer shall act reasonably and impartially". Het werken in dat spanningsveld tussen de opdrachtgever die voor een dubbeltje op de 1^e rij wil zitten en de aannemer die soms onredelijke meerwerken met onredelijke tarieven goedgekeurd wil hebben, is één van de lastigste randvoorwaarden van het werk van de Engineer. De discussies gaan dan vaak over zaken die in het bestek niet eenduidig geregeld zijn.	
Problemen oplossen	
- De procedures voor claims van aannemers (Clausules 2.5 juncto 3.5 en 20.2 e.v.) en van opdrachtgevers (Clausule 20.1 e.v.) zal volgens mij goed werken. Ik heb zelf geen ervaring met de DAB volgens de FIDIC (Clausule 20.2 e.v.), maar wel binnen vergelijkbare geschillenregelingen in andere contracten en die werkten goed. Voor een enkel geschil over een klein bedrag is de procedure te duur, maar als meerdere geschillen die elk over een klein bedrag gaan, gebundeld worden tot een pakket met een substantieel totaal bedrag wordt behandeld, kan dat met succes aan een DAB worden voorgelegd. - De "impartiality" van de Engineer kan bij Clausule 3.5 een probleem zijn, maar in 3.5 zit voor de aannemer de escape om via Clausule 20.2 het geschil aan de DAB voor te leggen. - Claims hebben een invloed op het vertrouwensniveau tussen de OG, ENG en ON. Het vertrouwen tussen de partijen kan nagenoeg volledig verdwijnen door ruzie over de afhandeling van geschillen. Ik heb zelf in een geschiladviescommissie gezeten waar de Employer, de Engineer en de Contractor weigerden om nog langer met elkaar over de geschillen te praten.	

In het Dikkowita project was Clausule 20.4 uit het FIDIC YB gewijzigd. De aanpassing van Clausule 20.4 regelt dat de beslissing van de DAB meteen na de uitspraak van kracht wordt en niet pas nadat de 28 dagen wachttijd waarbinnen arbitrage begonnen kan worden. De enige ratio hierachter is m.i. 4 weken tijdswinst. Als de DAB z'n werk goed gedaan heeft, is de kans klein dat de verliezende partij arbitrage opstart. De factuur van de winnende partij is dan al enkele weken ingediend aan het eind van de 28 dagen en wordt dus enkele weken eerder betaald. Dit is een beperkt belang, een groter belang zie ik niet van de aanpassing van Clausule 20.4.
Risicoverdeling
- De risicotoewijzingen in Clausule 4.12 en 17 zijn duidelijk, maar over de begrenzingen van sommige criteria zoals o.a. "unforseeable (physical conditions)" kan discussie ontstaan. De aannemer die geld krijgt voor "unforseeable" kwalificeert iets eerder als "unforseeable" dan de opdrachtgever die hiervoor moet betalen. Een nadere specificatie van unforseeable weather conditions is dan handig, bijvoorbeeld door op te nemen: "waarvan de frequentie minder dan 1x per 10 jaar is" (maar dan loop je het risico van het bestek weer een te dik document te maken). - Sommige risico's liggen duidelijk bij de partij die er het meeste invloed op heeft, zoals Clausule 17.3 sub f en g (gebruik van een deel van het werk door Employer en ontwerp van een deel van het werk door Employer). Vrijwel alle andere risico's zijn risico's waar noch Employer, noch Contractor invloed op heeft (het weer, oorlog, revolutie, oproer, explosieven in de grond, straling, etc). FIDIC heeft er voor gekozen om relatief veel van deze risico's bij de Employer te leggen. - M.b.t. de wijziging van Clausule 14.1 in het Dikkowita project (verrekenbare hoeveelheden): een Design&Build contract in combinatie met verrekenbare hoeveelheden kan een risico zijn. Dit gebeurt als de aannemer bewust erg ruim / conservatief ontwerpt met de bedoeling om via de verrekenbare hoeveelheden de Contract Price op te voeren. In de praktijk zal dit m.i. wel meevallen, omdat de Engineer de ontwerpen moet goedkeuren; bij twijfel over de juistheid van de overdimensionering kan hij hiervoor een second opinion aanvragen. Bovendien loopt de aannemer door de aanpassing van Clausule 14.1 in de Particular Conditions het risico dat als de Engineer 25% meer heipalen goedkeurt dan begrepen was in de Contract Price, dat hij de kosten daarvan elders in het werk weer compenseert door een deel van het werk daar te laten vervallen. Kortom: als er door overdimensionering door de ontwerper meerkosten ontstaan, zullen deze in de praktijk m.i. beperkt zijn. - M.i. wordt het veel ernstiger als er extra heipalen nodig zijn en die zijn niet verrekenbaar. Stel: de inschrijving en het contract gaan uit van 200 heipalen voor 600 Euro/stuk. De ontwerper berekent de noodzaak van 250 heipalen, waarvan de meerkosten echter niet verrekenbaar zijn. Stel dat de aannemer dan zijn ontwerper onder druk zet om zijn ontwerp zo aan te passen, dat het uitkomt op het minimale waarschijnlijk net voldoende aantal palen en dat wordt dan 210 palen. De aannemer brengt zijn aanvankelijk benodigde meerkosten terug met $(250-210) \times 500 = 20.000$ Euro. Maar hoe zit het met de kwaliteit en de levensduur van het bouwwerk dat de opdrachtgever opgeleverd krijgt. - Het is goed om het aantal verrekenbare posten zo veel mogelijk te beperken, zoals bijvoorbeeld in RAW-bestekken wordt gedaan door per post in een aparte kolom met de letter V aan te geven dat die post verrekenbaar is.
Continu verbeteren van de relatie
N.v.t.
Overige FIDIC Clausules
- Andere FIDIC Clausules die belangrijk zijn voor het creëren van vertrouwen tussen de OG (en de ENG) en de ON: voor onderstaande 3 gevallen is de FIDIC redelijker dan de meeste standaard contracten (m.n. redelijker dan Design&Build-contracten): - Zie laatste alinea: van Clausule 4.20 (Employers equipment and Free-Issue material) over de liability van material dat de Employer heft overgedragen aan Contractor en dat door Contractor bij die overdracht visueel is geïnspecteerd. Er staat: <i>The Contractor's obligations of inspection, care, custody and control shall not relieve the Employer of liability for any shortage, defect or default not apparent from a visual inspection.</i> In veel andere contracten wordt de aansprakelijkheid voor de kwaliteit van het overgedragen materiaal de aannemer zonder meer in de schoenen geschoven, inclusie verborgen gebreken. - Zie Clausule 8.4 sub d en 8.5 (Extension of Time for Completion en Delays), waar de Employer ruimhartig is met de oorzaken op grond waarvan extra bouwtime geclaimd kan worden. Hieronder bij voorbeeld verdraging bij de verlening van vergunningen die door de aannemer bij een overheid zijn aangevraagd. De gevolgen van 8.4 en 8.5 zijn bij veel Design&Build contracten voor risico van de aannemer. - Zie Clausule 13.8 (Adjustment of Changes in Cost), waar de FIDIC ruimhartig is met het toepassen van prijsaanpassingen. Ik verwacht dat de meeste Employers de Clausule 13.8 not applicable zullen verklaren in de Particular Conditions voor werken die niet langer dan 1 of 2 jaar duren en in een land met een redelijk laag inflatiecijfer worden uitgevoerd. Dan moet de aannemer gewoon een zelf ingeschatte reservering voor deze kosten opnemen in zijn offerte.

3. Antwoorden op de interviewvragen over 'wijzigingen'
Projectdoelen
N.v.t.
Risico management
N.v.t.
Wijzigingsprocedure
- De wijzigingsprocedure in Clausule 13 uit het FIDIC YB is m.i. duidelijk, efficiënt en effectief. De procedure om de prijzen aan te passen lijkt wat ingewikkeld, maar werkt goed als er in het betreffende land goede indices voor prijzen zijn, die ook frequent worden geactualiseerd. Dat is wel een voorwaarde. - De processen, de rollen en verantwoordelijkheden en de type wijzigingen die te claimen zijn, zijn duidelijk in het FIDIC YB. Bij redelijk gedrag van beide partijen bij de afhandeling van de Variations zal de procedure goed verlopen. In de praktijk willen opdrachtgevers echter zo min mogelijk betalen en willen aannemers zo veel mogelijk geld verdienen, waardoor de financiële afwikkeling meestal touwtrekken wordt. - De vroegtijdige waarschuwingsplicht in Clausule 8.3 in het FIDIC YB speelt een rol in de wijzigingsprocedure van Clausule 13. Als de aannemer een a.s. Variation vroegtijdig meldt, kan de opdrachtgever hierop anticiperen door kostenbewust met de aannemer mee te denken op de juiste oplossing voor de Variation te kiezen. Als er al vroegtijdig meerkosten gemaakt moeten worden heeft de opdrachtgever dan de gelegenheid om de inzet van personeel en equipment van de aannemer te monitoren, wat de controle

van de offerte van de aannemer vergemakkelijkt. Het is daarom te betreuren dat het FIDIC YB voor aannemer de melding van de a.s. Variation niet moet doen binnen X dagen nadat de a.s. Variation bij hem bekend werd, maar dat volstaan wordt met het vage “The Contractor shall <u>promptly</u> give notice to the Engineer . . .”. ▪ Andere soortgelijke “early warning” Clausules staan o.a. in: (alle gevonden met zoekterm promptly) ○ Clause 1.8 laatste alinea: over het melden van ontdekte fouten in documenten; ○ Clause 4.20 voorlaatste alinea: over het melden van ontdekte gebreken in “Employers equipment of free-issue material”; ○ Clause 4.24 tweede alinea: over het melden van aangetroffen archeologische vondsten; ○ Etc.	
Continu verbeteren	
▪	N.v.t.
Overige FIDIC Clausules	
▪	Er zijn <u>geen</u> andere FIDIC Clausules die belangrijk zijn voor het creëren van een efficiënt en effectief wijzigingsproces.

35. Dikkowita & FIDIC control group: Assessment data Dikkowita

35.1 The Sri Lankan culture

Power Distance Index (PDI) score 80 (VH)

In large power distance cultures, the powerful parties have privileges, the powerful dictate the negotiation conditions, parties treat all business partners and potential business partners unequally, parties are careful not to deceive more powerful parties, and there is no need to distrust less powerful parties (Hofstede et al., 2010, pp. 72, 76, 83; Verwaart, 2011, pp. 19, 114, 118).

Individualism versus Collectivism (IDV) score 35 (L)

In collectivistic cultures, parties prefer to do business with in-group members, form the relationship prior to the negotiations, pursue both their group's interests and their own personal interests, rely on social sanctioning systems and do not show distrust to in-group members. The thresholds for opportunistic behaviour, trust and forgiveness are based on group memberships and norms (Hofstede et al., 2010, pp. 113, 124, 130; Verwaart, 2011, pp. 19, 104-108).

Masculinity versus Femininity (MAS) score 10 (VL)

In feminine/co-operation oriented cultures, building relationships is important, focus is on good intentions rather than on performance, trust implies intrinsic trust (i.e. trust that accepts vulnerability), implicit trust is high and cheaters are looked down upon (Hofstede et al., 2010, pp. 155, 170, 180; Verwaart, 2011, pp. 18, 90-91).

Uncertainty Avoidance Index (UAI) score 45 (M)

In uncertainty avoiding cultures, parties express their emotions and aggression, only take known risks, need rules to trust, are hesitant to do business with new partners and do not trust them, and have a low deceit threshold towards strangers. Whereas in uncertainty tolerant cultures, parties suppress their emotions and aggression, are willing to take unknown risks, do not need rules to trust, are not hesitant to do business with new partners and do not particularly distrust them, and may be tempted to do deceit in order to make extra profit (Hofstede et al., 2010, pp. 203, 208, 217, 223; Verwaart, 2011, pp. 20, 132-135).

Long-Term Orientation versus Short-Term Normative Orientation (LTO) score 45 (M)

In long-term oriented cultures, parties will not put a relationship with a business partner at stake by deceiving, value their relationships, focus on building a strong market position, and avoid the risk of damaging their relationships. Whereas in short-term oriented cultures, parties may be tempted to do deceit in order to make extra profit, tend to grab a chance for an easy profit and are willing to put their relationships at stake for it, focus on transaction bottom line and quick profits, and are more opportunistic and analyze a deal in terms of pay-off rather than a relational network (Hofstede et al., 2010, pp. 243, 251; Verwaart, 2011, pp. 21, 147-150).

Indulgence versus Restraint (IND) no score

There is no score for this cultural dimension.

35.2 Assessment of trust in the project

Table 114: Assessment model for trust on project Dikkowita

Objective	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)	
Trust relationship between client and contractor	Initial trust	Trustworthiness during procurement	(1) Seek party with good track record, reputation and competence of financial and risk management	2	2.5
			(2) Seek party with similar culture/policy	3	2.5
		Objectives	(3) Joint goal setting (e.g. by formalized team building workshops)	3	2
		Communication system	(4) Clearly defined system of communication procedures and approaches	3	3
		Problem solving system	(5) Adopt joint problem-solving philosophy	3	2
		Risk allocation	(6) Draft a clear, unambiguous and equitable contract	3	2.5
		Continuous improvement system	(7) Agreed system for achieving continuous improvement of the relationship	3	1.5
	Trust during project implementation	Trustworthiness during project	(8) Reasonable behaviour (=working fairly and professionally)	3	2.5
		Communication during project	(9) Repeated fulfilment of communications/interactions	3	2.5
		Problem solving during project	(10) Problem-solving to mutual satisfaction at the lower levels	3	2
		Continuous improvement during project	(11) Emotional investments (e.g. by formalized team building workshops)	3	1
TOTAL LEVEL OF TRUST RELATIONSHIP			2.91	2.18	

(1+2) Trustworthiness (ability, integrity and predictability)

Main findings:

- A. According to the first ORET progress report 07-2007/12-2007, the Contractor was selected by means of direct negotiations in which the Contractor's proposal of 18-10-2006 was assessed. This proposal included the Project Management Plan, the Design Plan and the

Schedules for the programme, costs etc. Pursuant to (Vervoorn, 2014, p. 4), at the end of the year 2008, the Employer complied with all conditions for the funding of the project in order to start the project.

- 1/2 interviewees (#1P) was directly involved in the procurement and stated that the Contractor's proposal was comprehensive, especially the technical part. Therefore, it was sufficient for the Employer to determine the Contractor's technical competences to carry out the project. The Employer did not request any proof of the financial standing of the Contractor, because BAM International was a well-known Contractor.
- B. There is nothing in the project records with respect to factors which influenced the choice for this particular Contractor.
 - 1/2 interviewees (#1P) was directly involved in the procurement and stated that the financing of the project was an important factor for the selection of the Contractor. BAM (the Contractor) took the initiative to get the funding together for the project. Subsequently, the Contractor submitted his proposal to the MFARD of Sri Lanka.
- B. There is nothing in the project records regarding any requirements for the Contractor's team on the personal level.
 - 1/2 interviewees (#1P) was directly involved in the procurement and stated that the Employer did not have any requirements regarding the Contractors' representatives. The tender team was not the same as the project implementation team, partly because the project started three years after the procurement. The project implementation team was announced in the Contractor's Project Management Plan which was released after the contract award, so the Employer did not have an influence on the composition of this team. During the project, the Engineer may instruct the Contractor to replace an employee, but not without a valid reason.

(8) Trustworthiness (integrity and benevolence)

Main findings:

- A. According to the Project Records, the law of the contract is the law of Sri Lanka. Sri Lankan law is a mixed legal system containing Roman-Dutch Civil Law and British Common Law elements and includes the principle of good faith.
 - 2/2 interviewees state that the principle of good faith in Sri Lankan law did not have an influence on the behaviours of the Employer, the Engineer and the Contractor. This principle only becomes important if disputes were referred to the local courts.
 - 4/5 participants (#1, #2, #3 and #5) indeed confirm that the principle of good faith becomes important in case of arbitration or litigation.
 - #2 argues that the meaning of 'good faith' and 'reasonable behaviour' differs per culture, therefore the principle of good faith is quite useless in an international contract environment. For example, he once worked in another European country where his colleagues insisted that contractors were allowed to cheat and they found that quite reasonable, whereas from his cultural background cheating is always unreasonable.
 - #1 argues that the behaviours are very dependent on the type and attitude of the parties, for example, the Employer can be very strict to the letter of the contract, whereas the Contractor can be very claim conscious. In addition to that, #3 states that in general, employers and engineers act more in good faith than contractors do (they only act in good faith in second instance), but the market seems to accept that contractors overclaim while hoping a fair result remains after a settlement.
 - #1 and #5 state that it becomes more and more difficult for the parties to act in good faith as the financial consequences of such behaviour for the parties increases.
- B. Pursuant to §3.1 of the Particular Conditions and §3.5 of the General Conditions in the FIDIC YB, the Engineer must act reasonable and impartial. The FIDIC YB does not contain any similar clauses for the Employer and the Contractor. Further, according to §6.9, after commencement, the Engineer may instruct the Contractor to remove members of his team from the project if there are valid reasons to do so.
 - According to the interviewee who was not the Engineer (#2P), the Engineer acted reasonable and impartial in all situations.
 - 2/2 interviewees state that both parties had confidence in each other's ability to perform (e.g. the Contractor did deliver a high quality product), but there were a few contractual issues.
 - #1P argues (also in (Vervoorn, 2014, pp. 32-33)) that at the organization level, the Employer and the Contractor were reasonable and fair, but at the personal level, some members of the Contractor's team were less reasonable and fair. The Contractor submitted many variation requests, some of which were unreasonable or unreasonably priced. It was difficult to make compromises with the Contractor's Project Manager as he acted obstructive and unprofessional, especially near the end of the project. Therefore, issues were often escalated to the management and usually the parties would accept the compromise at this level. If the parties could not come to an agreement at this level, then the approach would be to 'like it or lump it'.
 - #1P argues (in (Vervoorn, 2014, p. 32)) that the Contractor's team was motivated to construct the harbour in accordance with the contract.
 - #2P states that there was a general willingness to move the project forward on all sides, but the parties merely performed their obligations under the contract to achieve this, rather than really to collaborate together.
 - #1P states that 90% of the time the parties were friendly towards each other, but 10% of the time the Employer and the Contractor were mainly trying to defend their ground as good as they can.
 - 2/2 interviewees (#1P in his IPMA report p 15, 32-33) state that the Contractor's Project Manager was removed from the project eventually, because he was obstructive to moving things forward. Thereafter, a senior Project Manager took over his job and it was possible to agree to the 'final scope agreement'.

(3) Objectives

Main findings:

- A. The project objective regarding the result (scope, cost, time, quality etc.) was defined in the contract and constitutes the realisation of a harbour combined with training and capacity building for the harbour manager. At the start of the project the Employer wanted to change the project result: with the same budget, a harbour must be build which was also suitable for larger ships. The latter was a wish from the user (CFHC). The Contractor did not want this variation because there was no budget for it, they wanted to deliver the project according to the original contract. Several months after the start of the project, the most important variation was instructed, which was to make the harbour partly suitable for larger ships. Near the end of the project (25-11-2011), the Employer and the Contractor

reached a 'final scope agreement' in which was the parties agreed to build the harbour as complete as possible with the available budget (Vervoorn, 2014, pp. 19, 29, 34).

- 2/2 interviewees state that the Contractor did comply with the 'final scope agreement', except for one matter. The Contractor issued an unjustified variation and claim for the bridge-road connection (i.e. it was due to his own error), therefore the Engineer rejected these. The parties did agree on a joint solution, but while the Employer was implementing his part of the solution, the Contractor decided to withdraw. The Employer did not have many resources to make the Contractor to finish the job. Payments could not be withheld because the project was financed by ORET. The Employer could only have the Engineer issue a claim for delayed completion. In the end, the job had to be finished by another contractor for at least 5 times as much money.
- B. At first instance, there seemed to be a WIN situation for both parties due to the direct negotiations procedure, otherwise the Contractor would not have taken on the project. It is not clear from the project records as to whether there was still a WIN situation for all parties at the end of the project.
 - 2/2 interviewees state that it doubtful whether there was still a WIN situation for all parties at the end. The Employer's objective was to increase and to improve the quality of the fishery. Eventually, this objective was achieved, because the harbour was complete and of high quality, but the bridge-road connection had to be constructed by another contractor for at least 5 times as much money. The Contractor's objective was to deliver the harbour according to the contract, within available time and budget, and with a profit. The Contractor did deliver an almost complete and high quality harbour, but both interviewees do not know whether his profit margins were as expected. #1P argues that the Contractor probably made less profit or even a loss with the project.
- C. Pursuant to §4.1 in the FIDIC YB, the works must be delivered on the basis of 'fitness for purposes' and must meet the 'Employer's Requirements' and the 'Contractor's proposal and schedules'.
 - #1P argues that 'fitness for purposes' was an achievable objective in this project. The Employer's objective regarding the project result was clearly stated by means of a new layout of the planned works. The Contractor did comply with this requirement, except for the bridge-road connection. The variations were necessary in order to meet the requirement. Sometimes the requirement 'fit for purposes' was also used to assess claims.
 - #2P states that the 'fitness for purposes' is always a point of contention between the parties. The Employer and the Engineer uses it to argue for a higher standard to be achieved, whereas the Contractor will normally state an item of work is fit for purpose once it functions correctly and meets the ER.
 - 5/5 participants state that 'fitness for purposes' is an achievable objective for the contractors. However, according to #1, #2 and #3, the Employer has to clearly state in the ER what he needs and what 'fitness for purpose' entails for him. #3 further argues that it often remains contentious because the likelihood of conflicting requirements increases as the amount of specifications increases.
- D. Usually, the Contractor is supposed to state in his letter of tender that he has ascertained that the Employer's Requirements contain no errors or other defects. In this project, the Contractor was selected by direct negotiations. Therefore the 'letter of tender' was probably deleted and replaced in the Particular Conditions clause 1.1. However, the other clauses regarding errors in the Employer's Requirements were still applicable. Before Commencement of the Works, pursuant to clause 5.1, the Contractor is obliged to scrutinize any design criteria and calculations in the Employer's Requirements and the items of reference mentioned in clause 4.7. Any error, fault or other defect found in these documents must be notified to the Engineer. Subsequently, the Engineer determines if it constitutes a Variation. After Commencement, according to clause 1.9, the Contractor may be entitled to financial compensation and/or extension of time if he finds any error, fault or other defect in the Employer's Requirements.
 - According to #2P, it was clear who was responsible for errors in the ER, but the parties still argued about it.
 - 4/5 participants (#1, #2, #3 and #4) state that it clear who is responsible for errors in the ER, the Employer is.
 - #5 argues that the Contractor is responsible for such errors due to his statement in the letter of tender, unless the errors are as such that an experienced contractor could not reasonably have detected them and the resulting delay could not have been avoided.
- E. There is nothing in the project records regarding the alignment of relational project objectives.
 - 2/2 interviewees indeed state that the Employer and the Contractor did not make any agreements regarding the relationship (i.e. how people should treat each other). #1P states that Sri Lankans do not create 'openness' and 'a good collaboration' by stating this in agreements. Instead, such aspects can be created by, for example, having a kick-off meeting and regular meetings in which the people are allowed to ask questions. In (Vervoorn, 2014, p. 31), #1P indeed states that openness in the team and mutual respect was created by means of involving all the Engineer's team members in the technical meetings with the Contractor and two senior members in the progress meetings with the Employer.
 - #1P also states in (Vervoorn, 2014, pp. 13-17) that involving the Employer in the processes (e.g. testing and acceptance) and the progress meetings from the outset has created trust between the Engineer and the Employer and trust in the Contractor for delivering a high quality. After the elections of May 2010, some key people on the Employer's team were replaced. In first instance, the new Project Director of PIU wanted a lot of control and had many demands and wishes, but at some point he understood that the Engineer had done a good job so far, which created trust in with the Engineer and a good co-operation between the two. Further, the Engineer's team assisted the MFARD and the PIU in certain things (e.g. in meetings, drawing up specific reports), which created trust and appreciation in the Engineer's team and resulted in a more optimal co-operation.

(4) Communication (system)

Main findings:

- A. In the Project Management Plan and the Note on Working Process, plans were drawn up for communication and information between the parties during the project. These include the meeting schedule, the progress reports, the document flow, the communication methods (DMS, letters, fax, mail etc.), document names, templates and procedures for invoices and payments.
 - 1/2 interviewees (#1P) was directly involved in the communication processes and states that the Employer, the Engineer and the Contractor did comply with these communication and information, and that they were standard plans of the Contractor and worked well.
- B. Communication is covered in FIDIC YB in §1.3 and §4.21. Pursuant to §1.3, formal communication (i.e. approvals, certificates, determinations) must be in writing and must not be unreasonably withheld or delayed. The Contractor has to draw up monthly progress reports and send these to the Engineer. The content of the reports are covered in §4.21. In the Particular Conditions, the period of reply

for some specific matters were halved compared to the General Conditions. In addition, a deemed acceptance was applicable to the exchange of the Contractor's Documents and other correspondence which calls for an answer such as acceptance etc. (Particular Conditions §5.2 and Project Management Plan). The periods of reply were amended to align these with the funding procedure.

- 1/2 interviewees (#1P) was directly involved in the communication processes and states that in general, the Employer, the Engineer and the Contractor did comply with these requirements in the FIDIC YB and the PMP, but sometimes the Engineer did not have much time to reply. It helped if the Contractor had made a planning in which he would indicate the submission dates and if the Contractor had included a priority list. It was important for the parties to take into account the principle of reasonableness and fairness with regard to the period of reply and deemed acceptance, and not to misuse the deemed acceptance.
 - #1P also states that the Contractor himself proposed to draft weekly progress reports besides the monthly ones required by clause 4.21. The weekly reports were used by him updates internally for anyway.
 - 2/5 participants (#1 and #3) state that usually, contractors do adhere to these communication clauses and the Engineer will see to it (e.g. by means of deducting payments).
 - 3/5 participants (#2, #4 and #5) state that in general, contractors are not very good in their formal communications, especially in writing progress reports, since these are often imprecise, incomplete and submitted late. The latter two participants also mention that contractors are quite good at specifying financial matters such as variations and interim payments.
- C. Pursuant to the Particular Conditions, clause 3.1 was amended. As a result, the Engineer has full authority to sign documents on behalf of the Employer.
- 0/2 interviewees were directly involved in the contract preparation process. The Employer and the Contractor drew up the Particular Conditions together, the Engineer was not involved in that process.
 - #1P argues that clause 3.1 was probably amended to increase efficiency, because the Engineer had more experience with FIDIC YB than the Employer did. The amendment does contain a contradiction though, because in the same clause they stated that the Engineer has to act impartially. In #1P's email of 21-10-2014, he further states even though the Contractor wanted this amendment, during project implementation, the Contractor did not want the Engineer to sign certain things.
 - #2P thinks that clause 3.1 was probably amended to facilitate the flow of information.
 - 4/5 participants (#1, #2, #3 and #5) think that this amendments may lead to problems, but there are several reasons.
 - #3 and #4 think such full authority does make the Engineer's job easier as he does not need the Employer's approval for instructing things. #2 argues that such full authority is unusual since the Engineer is often obliged to ask for the Employer's approval for certain matters before issuing any instruction to the Contractor.
 - #1 argues that problems may arise if the Engineer instructs matters to the Contractor which involve additional time or costs or a scope change without an explicit agreement from the Employer. #3 indeed states that the risk of cost overruns increases for the Employer.
 - #5 argues that problems may arise because on the one hand, the Engineer has to full authority to act on behalf of the Employer, but on the other hand, he still has to act reasonably and impartially towards the Contractor.

(9) Communication (repeated fulfilment)

Main findings:

- The contract documents did not lay down requirements regarding informal communication on the parties. According to the Project Management Plan Appendix C, the Contractor's management team consisted of Dutch people only.
- 1/2 interviewees (#1P) was directly involved in the communication processes and states the Employer, the Engineer and the Contractor have informal contact with each other by means of the co-location. Informal contact between the Employer and the Contractor ran through the Engineer and his team. The Engineer's office and the Contractor's office were located next to each other. The Engineer's team and the Contractor's team had a lot of interaction on different levels. Culture had an influence regarding this subject. The Engineer's team mainly consisted of Sri Lankans, whereas the Contractor's team was more a mix of Sri Lankans and expats. There was more interaction among the Sri Lankans.

(5) Problem solving (philosophy)

Main findings:

- A. §2.5 and §20.1 in the FIDIC YB deal with claims from the Employer and the Contractor respectively. If the parties have not come to an agreement after the Engineer's determination process, then the dispute may be escalated to the Dispute Adjudication Board (DAB). If the dispute is still not resolved, it may be referred to arbitration. The procedures and rules for this escalation process are included in §20 and in the Appendix to Tender.
- 2/2 interviewees state that the claims clauses were followed and worked well in terms of the determinations. There was no need to use the other clauses on this project. The claims were manageable and each was dealt with separately.
 - #2P also states that the timelines tended to drift after notification, because the Contractor always seemed to extend the process until he has a better idea of the full impact of the claim rather than to try and move things forward.
 - 1/5 participants (#5) states that the claims clauses in the FIDIC YB work well, the other participants have comments on these clauses or on the DAB clauses.
 - #2 argues that the Employer has to give notice 'as soon as practicable after becoming aware' in clause 2.5 is not specific enough and open to interpretation. Further, he argues that in practice, contractors submit their full claims event months after the claim event has occurred because there is no sanction if he fails to do so within 42 days.
 - #4 argues that the Engineer's determination in clause 3.5 may not always be respected by both parties.
 - #1 argues that it may be difficult to set up a post-dispute DAB, since a party may not want to acknowledge a nominated DAB person or a DAB's decision because they already know it will not turn out in their favour.
 - #3 mentions that the DAB sometimes proves to be poor.
- B. According to the Particular Conditions, the last paragraph of clause 20.4 was amended as a result that the DAB's decision is always binding and effective until finally settled by arbitration.

- 0/2 interviewees was directly involved in the contract preparation process. The Employer and the Contractor drew up the Particular Conditions together, the Engineer was not involved in that process.
- #1P argues that clause 20.4 was probably amended since it was necessary to complete the project quickly due to the financial settlement.
- 2/5 participants (#1 and #5) also think the clause is amended because of efficiency. The DAB's decision becomes effective immediately, so the parties will gain 4 weeks time.
- #2 argues that deleting the last paragraph of clause 20.4 also means that there is no time-bar for issuing a notice of dissatisfaction, therefore the parties may do so at any time to commence arbitration, so the DAB's decision can always be overruled.
- C. The Engineer's determination (clause 3.5) plays an important role in both claim procedures. Pursuant to §3.1 of the Particular Conditions and §3.5 of the General Conditions in the FIDIC YB, the Engineer must act reasonable and impartial.
 - 2/2 interviewees argue that the Engineer's impartiality was not an issue on the project. According to #1P, the impartiality of the Engineer was not a problem in the project at the management level, partly because the Engineer did not have the authority to accept force majeure and claims. The Project Director (RHDHV) had this authority. Besides, the Engineer often consulted a senior contract specialist for contractual issues. At the lowest level, there have been some accusations.
 - #1P further argues that since the start of the project, the Engineer acted in such a manner (e.g. sit next to the Employer during meetings) that the Employer would not think he is partial for the Contractor because the Contractor is also Dutch.
 - 5/5 participants state that the impartiality of the Engineer may cause problems on the project. In general, the Engineer is often accused by either party of being unfair or biased, especially in case of disputed claims. #1 argues that the Engineer's impartial determination can cause friction between the Engineer and the Employer if it is against the Employer. #5 argues that both parties can always refer the dispute to the DAB if the Engineer's determination is unfair.
 - #2 and #3 argue that the Engineer is not required to be impartial according to the General Conditions. The Engineer is the Employer's agent.
- D. In general, claims from the Contractor may have an influence on the trust level between the Employer, the Engineer and the Contractor.
 - #1P argues that only the unexpected and the unrealistic claims or variations had an influence on the trust level between the Employer, the Engineer and the Contractor, especially between the last two parties because the Engineer took care of many things on behalf of the Employer. In (Vervoorn, 2014, p. 17), #1P states that at the end of the year 2010 there were some disagreements between the Employer and the Contractor. Therefore, at that time, the Project Director of the PIU not only rejected the Contractor's invoice, but also the Engineer's invoice.
 - #2P argues that it is not the claims in themselves which had an such influence, but rather common frustrations on projects such as information issued late and people not doing what they said they would do.
 - 5/5 participants state that in practice, claims do have an influence on the trust level between the Employer, the Engineer and the Contractor, because claims often bring a lot of tension and distrust to the table, especially disputed claims. #3 argues that parties consider the claims to be unrealistic or unfair too quickly. #4 states that the timing, the motivation of the claim and the number of claims issued may also influence the trust level. The disputes about claims can destroy the trust between the parties completely.
 - 2/5 participants (#3 and #4) argue that justified claims should not have an influence on the trust level between the Employer, the Engineer and the Contractor, because issuing claims is the only way to deal with unexpected changes as it allows the other party to act before things get out of hand.
- E. The contract documents do not have requirements regarding problem-solving by amicable agreement.
 - According to the interviewees, in order to solve problems by amicable agreement the parties did the following: early notification by the Contractor (so that the Engineer could still adjust things), discuss claims informally, draw up draft determinations first, escalate to management, management meeting (which included project directors and contract specialists of Engineer's and Contractor's teams), and make compromises in order to move things forward.

(10) Problem solving (effectiveness)

Main findings:

- F. All problems seem to have been resolved by amicable agreement.
 - 2/2 interviewees state that all problems were indeed resolved by amicable agreement. However, some issues were escalated to the management level and the claim regarding the bridge-road connection was escalated to the Ministries of the Netherlands and Sri Lanka.
 - In (Vervoorn, 2014, pp. 29-30), #1P states that the Engineer tried to find solutions which are mutually accepted by the parties. In first instance, the Engineer tried to reach consensus with the Contractor through informal meetings about the variations and the claims, which did not work as the Contractor was not willing to co-operate and to make compromises. Thereafter, the Engineer used arguments and a draft determination, but it remained difficult to come to an agreement. Therefore, some variations and claims were escalated to the management level. In those meetings, the parties usually agreed on the proposed solution.
 - In (Vervoorn, 2014, p. 29), #1P states that it was important for the Engineer to avoid any conflicts in public with the Employer, because in Sri Lanka, behaviours in the meetings are related to hierarchical relationships and 'losing face' is a big issue. Therefore, in case of disagreements, it is better to discuss this another time or to formulate things differently.
 - #2P states that the claims reached a stage where the Parties had stated their positions but neither wanted to take the claims to the DAB or full arbitration, the compromise was a negotiated agreement where programme and cost matters were agreed and a contract addendum signed (the final scope agreement). The intent was to move the project forward rather than get caught up in protracted claims procedure. To achieve negotiated agreement, there has to be a degree of 'trust' between the Parties for it to work, it helps to have external input from the Engineers and Contractors organizations to facilitate this as the site teams can be too close to the problems that have occurred. The contract addendum did help move things forward initially, but other issues came along near the completion of the project that was not part of the initial negotiations (bridge-road connection being the main item). The 'new' issues were attempted to be resolved under the contract procedures but by then both Employer and Contractor had become entrenched in their positions again. The process did involve a degree of escalation to management both formally and informally, this was only partially successful.

(6) Risk allocation

Main findings:

- H. In the FIDIC YB, the risk allocation is covered in several clauses, for instance, in §4.12 (Unforeseeable Physical Conditions), §17 (Damage to the Works) and §19 (Force Majeure). According to the Particular Conditions §4.10, the risk of unexpected and unforeseen geotechnical conditions was shifted more towards the Employer.
 - 2/2 interviewees state that this risk allocation between the Employer and the Contractor was clear. #1P argues that there was some confusion in terms of the permits though.
 - #1P also argues that the geotechnical conditions were unknown and that it was difficult for the Contractor to prove that the geotechnical conditions were really unexpected though.
 - 4/5 participants (#1, #2, #3 and #5) state that in general, the risk allocation in the FIDIC YB is clear. #5 only argues that some limits such as 'unforeseeable' are open to interpretation and need to be more specific (e.g. 1 in 10 years for unforeseeable weather conditions).
 - 2/2 interviewees state that in the FIDIC YB, the risks are allocated to the party best able to manage them.
 - #1P also argues that the geotechnical conditions are an exception. On this project, the Employer became more liable for the geotechnical conditions. Although the Employer did choose the location, he did not have influence on the Contractor's design.
 - #2P further argues that clause 17.6 was amended to reduce the Contractor's liability, which is not uncommon and contractors will normally be required to reduce their exposure either as company policy or through instructions by their insurers.
 - 4/5 participants (#2, #3, #4 and #5) state that in the FIDIC YB, the risks are allocated to the party best able to manage them. #5 also argues that many of the risks either party cannot influence (e.g. the weather, war and explosives) are allocated to the Employer.
 - #1 argues that the risks in the FIDIC YB are not necessarily allocated to the party best able to manage them, because some risk such as the ground conditions cannot be foreseen by the Contractor too.
- I. Pursuant to the project records, the parties did not seem to have shared any risks in terms of liability.
 - 2/2 interviewees indeed state that the Employer and the Contractor did not share any risks in terms of liability.
- J. It is not clear whether the Contractor was rewarded for carrying his risks.
 - 1/2 interviewees (#1P) argues that the Contractor's reward for carrying risks was included as a risk allowance in the tender price and that the Contractor was compensated for the quantities subject to re-measurement.
- K. According to the Particular Conditions clause 14.1, the Contract Price consisted of the lump sum Accepted Contract Amount plus the quantities subject to re-measurement. A Design & Build contract in combination with re-measurable quantities seems to be a risk for the Employer since the Contractor determines the design.
 - According to the interviewees, the parties chose to work with re-measurable quantities (e.g. for the length of sheet piles, but not the type or quality, and the quantity of stones for the breakwater), because the geotechnical conditions were unknown. The amendment was probably at the request of the Contractor. A Design & Build contract in combination with re-measurable quantities is unusual and can indeed be misused by the Contractor since he determines the price schedule and the design. #1P further states in (Vervoorn, 2014, pp. 13-15) that the contract management of this project was comprehensive, partly because of the major scope change and these re-measurable quantities. The major scope change did result in some cost-savings as some parts were re-measurable.
 - Participant #1 knows the Dikkowita project and argues that the parties chose a lump sum contract in combination with re-measurable quantities, because on the one hand, there was a maximum budget due to the grant of the Dutch government, but on the other hand, the Contractor was reluctant to take full risk on lump sum for some items (e.g. the dredging works). #1 further states that it is not a standard solution, because if the quantities are much more than anticipated, the Employer may need to cut down the scope due to the maximum budget.
 - 2/5 participants (#2 and #5) state that a D&B contract in combination with re-measurable quantities may lead to problems, because the Contractor may act opportunistic by overdimensioning the design to increase the contract price. #5 argues that in practice, such behaviour is limited because the Engineer has to approve the designs and may consult someone if he has doubts about it. In addition, the Engineer may compensate the additional costs of an overdimensioned design by omitting other parts of the work.
 - 2/5 participants (#3 and #4) state that a D&B contract in combination with re-measurable quantities does not necessarily lead to problems if the ER are complete and well defined, or if the provisional sums are sufficient.

(7) Continuous improvement (system)

Main findings:

- L. There is nothing in the project records regarding a system or measures for the purpose of improving the relationship between the parties during the project.
 - 2/2 interviewees indeed state that the Employer and the Contractor did not agree on a system or measures for the purpose of improving the relationship between the parties during the project. The relationship improved informally by means of, for example, day-to-day contact and social events outside of work. The latter is common on international projects involving expat staff.

(11) Continuous improvement (emotional investments)

Main findings:

- M. There is nothing in the project records regarding formal meetings or workshops for the purpose of improving the relationship between the Employer and the Contractor.
 - 2/2 interviewees indeed state that there were no formal meetings or workshops for the purpose of improving the relationship between the Employer and the Contractor. The relationship improved informally by means of, for example, day-to-day contact and social events outside of work. The latter is common on international projects involving expat staff.

(x) Other trust components

- A. According to the interviewees, there are no other components which were relevant for building and sustaining trust between the Employer and the Contractor on this project.
- B. Remarks on existing components:
 - o #1P mentions an addition to 'repeated fulfilment of communications and interactions': at different levels

35.3 Overview of trust building aspects on the project

Table 115: Overview of trust building aspects on project Dikkowita

Building trust (score 3-4)
(1) The Contractor took initiative to get the funding together to start up the project
(1) Direct negotiations
(1) Negotiated contract
(3) Focus on the target in terms of the programme mainly due to the funding of the project
(3) The Contractor was delivering a high quality product
(4) Clear communication system
(4) Use of a shared Document Management System
(4) Extensive use of standard forms and registers
(5) Clear claims procedures
(6) The risks were allocated to the party best able to manage them.
(6) Clear risk allocation
(6) The Contractor most likely did include a risk allowance to his tender price, because there were no competitors
(8) Both parties had confidence in each other's ability to perform
(8) The Engineer may instruct the Contractor to replace an employee
(9) A lot of informal communication at all levels on a day-to-day basis by means of the fulltime co-location
(10) External input from Engineer's and Contractor's organizations to resolve problems
Could be done better to build trust (score 2-2.5)
(1) Requirements on the organizational level were merely based on the technical competences
(1) No other award criteria, besides cost and quality
(1) The Employer did not have any requirements regarding the Contractor's team
(1) The tender team was not the same as the project implementation team, partly because the project started three years after the procurement
(3) No other mutual objectives besides fitness for purpose
*(3+8) No collaboration agreements
(3) At the end of the project, there was most likely no WIN situation for all parties anymore due to the scope change (i.e. harbour also suitable for large ships) and the disputed bridge-road connection.
(3) Major scope change at the beginning and the 'final scope agreement' was only reached near the end of the project.
(4) In the Particular Conditions, the period of reply for some specific matters were halved compared to the General Conditions, which increased the administrative burden for the Engineer.
(5) No true early warning, but only early notification of claims.
(5+9) Informal claims discussions and draft determination not always effective
(5) No true collaboration and help to resolve problems, but only informal discussion about claims and the draft determination.
(5+8) There was a general willingness to move the project forward on all sides, but the parties merely performed their obligations under the contract to achieve this, rather than really to collaborate together.
(5) The timelines tended to drift after notification of claims because the Contractor wants to have a better overview of the full impact of the claims.
(6) The combination D&B contract, re-measurable quantities and a maximum budget required a lot of work from the Engineer as it may have given rise to problems (e.g. overdimensioning and scope reduction)
(8) 90% of the time the parties were friendly towards each other, but 10% of the time the Employer and the Contractor were mainly trying to defend their ground as good as they can.
(8) The Contractor's contract manager was obstructive to moving things forward
*(9) Less interaction between the expats and the Sri Lankans.
(10) Post-dispute DAB
(10) Some management meetings to resolve problems, but sometimes it was difficult to make a compromise. Therefore, it came down to a 'like it or lump it' approach for the Employer.
(10) The Contractor withdrew from the bridge-road solution and did not finish the job.
(10) The Employer did not have many resources (e.g. sanctions or incentives) to control the Contractor.
Building distrust (score 1-1.5)
(5+8) The Engineer's dual role (i.e. act reasonable and impartial and on behalf of the Employer)
(5+8) The Contractor submitted some unexpected, unjustified or unreasonably priced variations requests and claims
(6) No risk sharing
(7+11) The relationship improves informally on a day-to-day basis by means of the co-location and social events.
(8) The principle of good faith in the law is not applicable on site, partly because of the international contract environment, but it only becomes important in case of arbitration or litigation

BOLD = (Related to) condition of contract, ITALIC = Amendment to contract, GREY = Important aspect, * = Influenced by culture

35.4 Assessment of change management in the project

Table 116: Assessment model for change management on project Dikkowita

Objective	Topic	Criteria = standard	Level (1-4) standard	Level (1-4)	
Efficient and Effective CM Process	Anticipate change	Objectives	(1) Align project goals and objectives	3	2
		Change management procedure	(2) Clearly defined change management procedures and processes and roles and responsibilities therein, and agree on the type of changes to consider	3	2.5
		Risk allocation	(3) Agree on project philosophy with regard to risk allocation	3	2.5
		Risk management procedure	(4) Prior identification of areas where changes likely occur (e.g. by risk management)	3	2
	Learn from change	Continuous improvement	(5) Conduct a review and create lessons learned from the change event	4	1
			(6) Update shared databases and incorporate lessons learned for project and organization	4	1
	Recognize change	Change management process	(7) Early identification of potential changes	4	2.5
			(8) Assess potential impacts (e.g. by value engineering) and create a proposed change order	3	3
			(9) Document the proposed change in a log	3	3
	Evaluate change		(10) Determine priority of the change	3	2
			(11) Selection of optimum change options by consulting all relevant parties	3	2.5
			(12) Identify the likely impacts of different change options	3	2.5
			(13) Prompt decision making as to whether to accept/reject the change by someone with authority	3	2
	Resolve change		(14) Communicate final change decision to all team members whose work is affected by it	3	3
			(15) Appropriate documentation to record all decisions within the change process	3	2
	Monitor implementation		(16) Monitor and record implementation	3	3
TOTAL LEVEL OF CHANGE MANAGEMENT			3.19	2.28	

(1) Objectives

Main findings:

- A. There is nothing in the project records with respect to change management objectives.
 - o 1/2 interviewees (#1P) was directly involved in the variations process and states that the Employer and the Contractor did align objectives with regard to change management. The results (i.e. stay within the budget and there must be an agreement between the Employer and the Contractor with respect to variations) and the procedures were aligned.
- B. There is nothing in the project records with respect to risk management objectives.
 - o 2/2 interviewees indeed state that the Employer and the Contractor did not align objectives with regard to risk management.

(3) Risk allocation

See trust criteria (6).

(4) Risk management

Main findings:

- A. According to the Project Management Plan, the Contractor's risk management consisted of drawing up and maintaining the risk register, and the risk discussions during progress meetings. On behalf of the Employer, the Engineer also maintained a risk register and included risk lists to the meeting minutes and progress reports.
 - o 2/2 interviewees state that these risk management plans worked well. #1P argues that the Engineer did not have any insight into the Contractor's risk management processes. The Engineer did comply with his risk management plans and the Employer was kept up to date about the risks by means of the meeting minutes and the progress reports.
- B. It is not clear from the project records how proactive the risk management approach of the parties was.
 - o According to the interviewees, the risk management approach by the Employer, the Engineer and the Contractor during the project was half reactive/half proactive to largely proactive. #1P argues that on the one hand, the Employer and the Contractor often did not know what to do when risks events occurred, and on the other hand, the Engineer was very proactive and solved such problems as much as possible.
 - o 2/2 interviewees state that risk management did not play a role in the change management procedure. #2P argues that on projects of this nature (marine civil engineering) the variations will tend to occur in the obvious locations (i.e. the physical works, the ground conditions, the weather etc.). These can be dealt with under the normal contract mechanisms.

(2) Change management procedure (overall)

Main findings:

- A. The variations procedure was set out in the Project Management Plan and deviated slightly from the one in FIDIC YB §13. Pursuant to the Particular Conditions §13.1, the Engineer is not allowed to give a direct instruction for a variation unless the Employer and the

Contractor have agreed upon the impact. In addition, there was an extra step which consisted of checking whether there are sufficient funds to carry out the variation.

- #1P states that the variations procedure deviated because of the funding of the project (i.e. there was a maximum budget).
 - #1P (in his email of 21-10-2014) and #2P argue that limitation of the Engineer authorization to give instruction for variation had a paralyzing effect and slowed down the procedure.
 - 2/2 interviewees state that the processes, the roles and responsibilities, and the type of variations claimable are clear in the FIDIC YB. #2P argues that on projects of this nature (marine civil engineering) the change / variations will tend to occur in the obvious locations (i.e. the physical works, the ground conditions, the weather etc).
 - 3/5 participants (#1, #2 and #5) state that the processes, the roles and responsibilities, and the type of variations claimable are clear in the FIDIC YB.
- B. The project records do not show whether the parties have adhered to the change management procedure which was agreed upon.
- 2/2 interviewees state that the Employer, the Engineer and the Contractor did comply with the variations procedure. However, #2P argues that it tended to drift a little after the initial notification, which is not uncommon.
 - #1P also mentions that the system was not always efficient due to the funding of the project. The communication with ORET about variations was not included in the contract, which sometimes caused delays when the Contractor did not co-operate.
 - 4/5 participants (#1, #2, #4 and #5) state that the variations procedure in the FIDIC YB is efficient and effective.

Score: 3

(7) Change management procedure (early identification)

Main findings:

- C. It is not clear from the project records how proactive the change management approach of the parties was.
- According to the interviewees, the change management approach by the Employer and the Contractor during the project was half reactive/half proactive to largely proactive. #1P argues that, for example, at the beginning, the Employer immediately notified the variation to make the harbour suitable for larger ships, but the Employer failed to elaborate the new plans due to a lack of capacity. The Contractor was very proactive in terms of elaborating the new plans. #2P states that as with any project of this type, you are expecting variations to occur from day 1 so it is not surprise when they do occur. It can become a problem if they are predominately from one or two main areas (e.g. design based, ground conditions).
- D. §8.3 in the FIDIC YB contains an early warning provision. The Contractor must notify the Engineer for future events or circumstances which may have a negative impact on the works, the costs or the programme.
- 2/2 interviewees state that this early warning obligation did not play a role in the variations procedure, but the Contractor's notification of claims did.
 - 3/5 participants #2, #4 and #5) state this early warning obligation does play a role in the variations procedure, but they mention different reasons.
 - #2 argues that there is an indirect relation, because the mitigation measures of such future events or circumstances may consist of variations.
 - #4 argues that this early warning obligation may encourage value engineering by the Contractor.
 - #5 argues that the early warning obligation also applies to potential variations.
 - #1 states that this early warning obligation does not play a role in the variations procedure.

(7-16) Change management procedure (standard processes)

Main findings:

- E. The Project Management Plan in combination with the FIDIC YB §13 set out the standard change management processes for this project.
- According to the interviewees, these processes correspond more or less with the ones in the assessment table.
 - There were a few remarks on the processes:
(13) The speed of decision-making depended on the clarity about the impact of the change, the Contractor's co-operation regarding the financial consequences and the ORET's approval.
 - Overall, the change management procedure was followed as consistent as should be.

(9+15-16) Change management procedure (documentation)

Main findings:

- F. According to the PMP, the parties used standard forms to record variations.
- According to the interviewees, an audit trail is created by means of the standard forms.

(5+6) Continuous improvement (review and share knowledge)

Main findings:

- C. There is nothing in the project records with regard to learning from changes and sharing this knowledge.
- 2/2 interviewees state that the Employer, the Engineer and the Contractor did not create 'lessons learned' from change events during the project. #1P argues that the parties may have done this internally, but due to the claims this knowledge was not shared between the parties.
- D. There is nothing in the project records with respect to measuring the risk management performance.
- 2/2 interviewees state that the Employer, the Engineer and the Contractor did not measure the performance (efficiency and effectiveness) of the risk management processes during the project and adjust these if needed.

(x) Other change management components

- A. According to the interviewees, there are no other systems or processes which were relevant for creating an efficient and effective change management process on this project.

35.5 Overview of efficiency and effectiveness creating aspects on the project

Table 117: Overview of efficiency and effectiveness creating aspects on project Dikkowita

Creating efficient and effective CM process (score 3-4)	
(1) Change management objectives were aligned regarding the procedure and the results	
(2) Clear change management procedure	
(2) Use of standard form and change register	
(3) The risks were allocated to the party best able to manage them.	
(3) Clear risk allocation	
(3) The Contractor most likely did include a risk allowance to his tender price, because there were no competitors	
(7) Informal discussion of variations and draft determination first	
(7-16) Overall the change management procedure is followed as consistent as should be	
Could be done better to create efficient and effective CM process (score 2-2.5)	
(2) Due to the mutual change management objective to stay within the budget, the Engineer was not authorized to give instructions for variations, which had a paralyzing effect on his job and slowed things down	
(3) The combination D&B contract, re-measurable quantities and a maximum budget required a lot of work from the Engineer as it may have given rise to problems (e.g. overdimensioning and scope reduction).	
(4) Limited joint risk management procedure	
(4) Both parties are responsible for their own risk management. No insight into each other's risk management processes	
(4) The risk management approaches of both parties were not aligned.	
(4) Risk management is not closely related to change management	
(7) Only early identification of potential variations by means of the notification of claims	
(7) The change management approaches of both parties were not aligned	
(7-16) Standard change management processes are applied to a large extent	
(7-16) Timelines tended to drift a little after the initial notification because the Contractor wants to have a better overview of the full impact of the variation.	
(7-16) Variations process not as efficient due to the project funding, the maximum budget and the required agreement between the Employer and the Contractor	
(15) Use of standard forms and change register to create a basic audit trail	
Creating inefficient and ineffective CM process (score 1-1.5)	
(1) No mutual risk management objectives regarding the procedure and the results	
(2) The Engineer's dual role (i.e. act reasonable and impartial and on behalf of the Employer)	
(3) No risk sharing	
(5+6) The parties do not create lessons learned specifically from change events, learning from changes happens informally and unknowingly. The parties do not measure the risk management performance.	
(7-16) The Contractor submitted some unexpected, unjustified or unreasonably priced variations requests and claims	

BOLD = (Related to) condition of contract, ITALIC = Amendment to contract, GREY = Important aspect

35.6 Most important components according to the interviewees

Table 118: Ranking of the components by the interviewees of Dikkowita

Components for building and sustaining trust				Components for an efficient and effective change management process			
C	12	1.	Joint goal setting	C	8	1.	Joint goal setting for change management & risk management
C	11	2.	Trustworthiness of person: Track record, reputation, competences (financial, technical)		7	2.	Early warning
	10	3.	Reasonable behaviour		6	3.	Risk management system
C	9	4.	Equitable risk allocation	C	5	4.	Equitable risk allocation
IC	8	5.	Problem-solving at the lower levels	C	4	5.	Clearly defined change management procedure and roles/responsibilities therein
IC	7	6.	Clearly defined communication system		3	6.	Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.
IC	6	7.	Joint problem-solving		2	7.	Appropriate documentation of the change process
	5	8.	Trustworthiness: Culture, policy		1	8.	Learning from changes and sharing this knowledge
IC	4	9.	Repeated fulfilment of communications and interactions				
	3	10.	Emotional investments				
	2	11.	System for continuous improvement of the relationship				
C	1	12.	Trustworthiness of organization: Track record, reputation, competences (financial, technical)				

36. Comparison projects: Overview of the influence of trust on the change management process

- = not stated in the project records or mentioned during the interviews

N/A = not applicable

↓ = in case of distrust

#/# = shows how many interviewees mention it

* = new aspect compared to the given answers

GREY = most important relationships between trust and the change management process according to the interviewees and the author

Bijlmerweide	Drachtsterweg	Forres	Dikkowita	Comparison
Indirectly influenced by trust (Trust is needed to...)				
Apply the CM procedure correctly or accept any deviations from it	Apply the CM procedure correctly	Apply the CM procedure correctly	Apply the CM procedure correctly	Apply the CM procedure correctly
-	Apply the RM procedure correctly	Apply the RM procedure correctly	-	*Apply the RM procedure correctly
-	-	Align the CM objectives	Align the CM objectives	*Align the CM objectives
-	-	Align the RM objectives (focus on the target by means of the pain/gain mechanism)	-	*Align the RM objectives
-	-	Agree on the risk allocation	Agree on the risk allocation	*Agree on the risk allocation
Directly influenced by trust (If there is trust/distrust...)				
Open informal communication structure > early notification	-	Fulltime co-location > formal and informal EWs	-	*Open and informal communication structure > early notification of potential variations by both parties
Focus on the target > early notification	Contradictory project objectives > self defence > late notification of potential variations ↓	Joint risk management and common project objectives > mutual early warning > early notification of potential variations	-	*Common project objectives and focus on the target > early notification of potential variations by both parties
Deviate from formal procedure (i.e. submit change order afterwards in order to increase efficiency)	-	Deviate from formal procedure (i.e. submit change order afterwards in order to increase efficiency)	-	Deviate from formal procedure (i.e. submit change order afterwards in order to increase efficiency)
The Contractor shows goodwill and there is a good mutual understanding > Decision-making more flexible and quicker, since it often concerns a grey area in the contract	Reluctance to accept claims related to the Employer's Requirements and 'us versus them' behaviour at the lowest level and escalations > inefficient change management process > packaged deal at the highest level ↓	'Gain' situation > allows more freedom for the parties to be a bit more forgiving.	No co-operation and difficult to make compromises > inefficient change management process > 'like it or lump it approach' ↓	More flexibility in decision-making about 'grey' variations
-	Works offered at a low price > more questionable variations to generate profit ↓	No unexpected or contentious claims	Less profit than expected > more unreasonable and unreasonably priced variations and claims to generate profit ↓	WIN situation for the Contractor > No unexpected, unjustified and unreasonably priced claims and variations
-	Collaboration and help to resolve mutual problems and Contractor's problems is not always effective ↓	Working together and solving problems as a team and challenge each other to achieve the common project objectives	-	Collaboration and mutual help to resolve mutual problems in order to achieve the common project objectives
N/A	N/A	No doubts about the Project Manager's dual role (i.e. as a certifier and the employer's agent) > no escalations needed	Doubts about the Engineer's dual role (i.e. as a certifier and the employer's agent) > escalations needed ↓	*No doubts about the Employer's agent's dual role (i.e. as a certifier and the employer's agent) > no escalations needed
-	The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides ↓	-	-	*The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides ↓
-	The change management process is not very efficient due to disagreements about the price at the lowest level and the escalations	-	Timelines tended to drift a little after the initial notification because the Contractor wants to have a better overview of the full impact of the variation ↓	Inefficient change management process due to no insight into the full impact of the variation and no quick agreement on the price ↓

	or because the Contractor did not put the variation yet ↓			
-	More communication by email instead of informal visits in order to confirm things ↓	-	-	*More communication by email instead of informal visits in order to confirm things ↓
According to the given answers (If there is trust...)				
Average score by the interviewees: 75% of the efficiency is influenced by trust	Average score by the interviewees: 50-75% of the efficiency is influenced by trust	Average score by the interviewees: 75% of the efficiency is influenced by trust	Average score by the interviewees: 75% of the efficiency is influenced by trust	Average score by the interviewees: 75% of the efficiency is influenced by trust
2/4 Efficiency: less time needed to check the variation and its impact.	10/10 Efficiency: no unjustified, unreasonable and unexpected variations, therefore less substantiation needed, less time needed to check the variation and its impact and quicker acceptance of the fact that it is a variation to the contract	6/6 Efficiency: less substantiation is needed by the Contractor and less time needed to check and to verify the variation and its impact as the Employer does not expect to find any problems.	1/2 Efficiency: less time needed to check the variation and its impact.	Efficiency: no unjustified, unexpected and unreasonably priced variations, therefore less substantiation needed, less time needed to check the variation and its impact and quicker acceptance of the fact that it is a variation to the contract as the Employer does not expect to find any problems.
1/4 Efficiency: there is focus on the target, so the Contractor may submit change orders afterwards (no need to stop working, thus beneficial to the schedule)	-	1/6 Efficiency: the Employer is going to trust that the Contractor is going to manage it efficiently using the right resources and the right time to keep things moving	-	Efficiency: the Employer is going to trust that the Contractor has focus on the target and is going to manage it efficiently using the right resources and the right time to keep things moving (e.g. to increase efficiency, continue the works and submit change orders afterwards)
-	-	1/6 Efficiency: there will be less disputes, because you will put more effort into what is important (i.e. the big figures) and less emphasis on the small stuff.	1/2 Efficiency: the parties are willing to co-operate	Efficiency: the parties are willing to co-operate and there will be less disputes, because you will put more effort into what is important (i.e. the big figures) and less emphasis on the small stuff.
Average score by the interviewees: 25% of the effectiveness is influenced by trust	Average score by the interviewees: 25% of the effectiveness is influenced by trust	Average score by the interviewees: 50-75% of the effectiveness is influenced by trust	Average score by the interviewees: 50% of the effectiveness is influenced by trust	Average score by the interviewees: 50% of the effectiveness is influenced by trust
2/4 Effectiveness: 0% influenced, parties are obliged to follow the variations procedure.	5/10 Effectiveness: 0% influenced, parties are obliged to follow the variations procedure (it has to be a good procedure though).	1/6 Effectiveness: the parties can still achieve a close out in the end, but it will not be a pleasant and quick process	-	Effectiveness: 0% influenced, parties are obliged to follow the variations procedure (it has to be a good procedure though).
-	1/10 Effectiveness: 0% influenced, the Contractor will follow the variations procedure anyway, because variations generate income.	-	-	Effectiveness: 0% influenced, the Contractor will follow the variations procedure anyway, because variations generate income.
-	1/10 Effectiveness: the parties will follow the variations procedure correctly.	1/6 Effectiveness: the parties follow the correct procedures.	-	Effectiveness: the parties will follow the variations procedure correctly.
-	1/10 Effectiveness: 0% influenced, the decision as to whether something is a variation to the contract does not depend on trust.	-	-	Effectiveness: 0% influenced, the decision as to whether something is a variation to the contract does not depend on trust.
1/4 Effectiveness: submit right change option and right impact	2/10 Effectiveness: submit right change option and right impact and no doubts about whether it adds value (trust based on competences and experience).	2/6 Effectiveness: more likely to submit correct and verifiable change option and impact Effectiveness: the Employer is more likely to accept it and gives you the resources for it as he believes that your judgement is correct and that your goal is at his best interests	-	Effectiveness: The Contractor will more likely submit a right and verifiable change option and impact (trust based on competences and experience) and the Employer has less doubts about whether it is a right change option and whether it adds value, so he is more likely to accept it as he believes that the Contractor's judgement is correct and that the Contractor's goal is at his best interests.
-	2/10 Effectiveness: no unjustified, unreasonable and unexpected variations	1/6 Effectiveness: the Contractor is working towards the same goal or outcome for	-	Effectiveness: the Contractor is working towards the same goal or outcome for

		changes, so does not submit unjustified variations		changes, so he does not submit unjustified, unreasonable and unexpected variations.
-	-	1/6 Effectiveness: the parties will believe that the other will meet their expectations and is delivering what he should in terms of the project	-	Effectiveness: Both parties will believe that the other will meet their expectations and is delivering what he should in terms of the project
-	1/10 Effectiveness: no need for grey compromises (if there is disagreement about whether something is a variation to the contract)	-	-	Effectiveness: no need for grey compromises (if there is disagreement about whether something is a variation to the contract)
-	5/10 Effectiveness: the parties will co-operate and deal with the variation. If there is no trust, the Employer will say that it is not a variation to the contract, that it is not substantiated adequately etc.)	2/6 Effectiveness: less reluctant to agree to the variation or to believe that it is a variation to the contract	1/2 Effectiveness: easier to achieve a higher goal due to collaboration (i.e. co-operation and thinking along).	Effectiveness: the parties are less reluctant to agree to the variation, to believe that it is a variation to the contract, to co-operate and to deal with the variation. By means of collaboration (i.e. co-operation and thinking along) it is easier to achieve a higher goal.
-	1/10 Effectiveness: people tend to listen more to each other and act upon it.	1/6 Effectiveness: you will not end up in a situation where there will be more and more CEs and so on which will just be rubbish or scold out to come back another day. You will end up with all these CEs being dealt with at the end of the contract.	-	Effectiveness: people tend to listen more to each other and act upon it by dealing with the variations directly.
-	1/10 Effectiveness: it is less likely that disputes will be escalated to the court	1/6 Effectiveness: less likely to end up in a dispute which may be referred to arbitration or the court	-	Effectiveness: less likely to end up in a dispute which may be referred to arbitration or the court
-	-	2/6 Effectiveness: is also influenced by the efficiency, as 'a minimum use of resources' to implement a change may also be an objective of the change management process.	1/2 Effectiveness: is also influenced by the efficiency, as this is often an objective as well due to a maximum budget.	Effectiveness: is also influenced by the efficiency, as 'a minimum use of resources' to implement a change may also be an objective of the change management process due to a maximum budget.

37. Comparison projects: Overview of the decisive trust aspects

- = not stated in the project records or mentioned during the interviews

N/A = not applicable

↓ = could be better to create trust

↓↓ = creating distrust

Bold = condition of contract

Italic = amendment to contract

* in Drachtsterweg project = influenced by the Employer's traditional way of acting

* in Forres project = influenced by the strategic partnering

* in Dikkowita project = influenced by culture

At least two aspects the same on the projects means it is important, so these will be included in the 'comparison table'. The author can also override this rule if an aspect seems to be really important and needs to be included in the 'comparison' table. Such aspects will be highlighted grey.

	Bijlmerweide	Drachtsterweg	Forres	Dikkowita	Comparison
Procurement	(1+2) Direct agreement procedure, National tender. The Employer was allowed to select the contractors of his own choice (1) The tender team is the same as the project implementation team (1) Requirements on the personal level were merely based on the technical competences ↓ (1) MEAT award criterion: only based on price and quality ↓	(1) MEAT award criterion was not applied correctly and did not include the technical proposals, as a result it became a lowest price procurement ↓↓	(x) Client leadership in promoting the collaborative approach *(1+2) Best value procurement, European tender *(1+2) The Employer was looking for local representation and a Contractor with long-term employees and wanted to meet the project implementation team rather than the marketing team *(1+2) Multiple selection and award criteria from long-term perspective. The organizational culture, the competences and the benevolence were paramount.	(1) The Contractor took initiative to get the funding together to start up the project (1) Direct negotiations	(1) Client or Contractor leadership (1+2) The possibility to select the winning tender on the basis of the assessment of the Contractor's trustworthiness (ability, benevolence, integrity, predictability and reliability) (1) The involvement of the project implementation team in the tender phase to check whether they are able and willing to work in accordance with how the Employer's way of working. (1) The use of the MEAT award criterion: price and quality. (2) The use of other criteria: the Contractor's organizational culture and benevolence
Contract	(1) No significant amendments to the UAC-IC 2005	(1+5) 'Like it or lump it' contract which contains many amendments ↓↓ (6) Risks are allocated to the party best able to manage them, except for the geotechnical conditions ↓ *(11) Disagreement about the interpretation of the D&C contract (i.e. the Employer's role and the design freedom) ↓↓	(1+6) Negotiated contract (6) Joint risk workshop to tailor the risk register specific to the project and to allocate the risks to the party best able to manage them. The Employer's risk allowance covers unforeseen risks. (6) The Contractor's risk allowance was negotiated and is part of the pain/gain share mechanism	(1) Negotiated contract	(1) No significant amendments to the standard form of contract or a negotiated contract (6) Allocation of risks to the party best able to manage them
People	(8) The Contractor's goodwill, passion and motivation to deliver a good project (8) Reasonable and fair behaviour of both parties	(8) 'Us versus them' behaviour and no mutual reasonable and fair behaviour at the lowest level ↓ (5+8) The Employer is quite reluctant to accept claims related to the Employer's Requirements ↓↓ (8) Good faith in the DCC only has influence at the highest escalation level ↓	(8) By large, all parties understand the meaning of good faith and act in good faith (8+x) The Contractor has set up and organized his management team by checking if people are capable and willing to work in accordance with that 'spirit of mutual trust and co-operation'. It comes down to the individuals involved. *(8+x) Past co-operations on the other flood schemes and previous joint lessons learned workshops *(8+x) Continuity of staff in all parties (8) Mutual trust and co-operation clause in the NEC2 ECC is not effective in itself, but forms a good basis for building trust. The intention of the clause is clear, but it remains open to interpretation and cannot be enforced ↓ *(5) The Project Manager can act impartial and fair by means of help from the Independent Cost Consultant, as he draws up the quotation for CEs	(8) Both parties had confidence in each other's ability to perform (8) 90% of the time the parties were friendly towards each other, but 10% of the time the Employer and the Contractor were mainly trying to defend their ground as good as they can. (8) The Contractor's contract manager was obstructive to moving things forward ↓ (5+8) The Engineer's dual role (i.e. act reasonable and impartial and on behalf of the Employer) ↓↓	(8) Confidence in each other's ability to perform and to deliver a good project (8) Reasonable and fair behaviour of both parties at all levels, at all times and throughout the whole project (5+8) The Employer is quite reluctant to accept claims related to the Employer's Requirements ↓↓ (8) The selection of people who are capable and willing to work in accordance with the Employer's way of working because it comes down to the individuals involved (5) The Employer's agent can act impartial and fair by means of help from an Independent Cost Consultant, as he draws up the quotation for claims

Process	(3) Focus on the target in terms of the programme mainly due to strict deadlines and fines. (9) A lot of informal communication by means of phone, email, visits etc. (5) Only informal EWs with no sanctions ↓ (5+9) Informal discussion and agreement prior to sending the formal documents (10) Timely joint problem-solving at the lowest levels	* (5) The Contractor fails to give EWs, whereas the Employer gives many EWs, but these are unwanted ↓ (5+6) Disagreement about the responsibility of the unexpected geotechnical conditions ↓↓ (3+8) The collaboration agreements (openness, focus on the target, timeliness etc.) are quite standard and are not fully effective due to contradictory interests ↓ (5+8+x) The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides ↓	(3+6) Focus on the target in terms of the costs and programme mainly due to the pain/gain share mechanism * (9) A lot of informal contact on a day-to-day basis by means of the fulltime co-location * (5) Mutual formal and informal early warnings (5+9) Informal discussion and agreement prior to sending the formal documents (6) Clear risk allocation * (6) The financial risk is shared by means of a pain/gain share mechanism, which promotes the partnership and encourages the Contractor to be innovative and efficient in order to create a 'gain' for all parties (10) All problems were resolved by amicable agreement within the Project Team (5+x) Working together and solving problems as a team and challenge each other to achieve the common project objectives * (5+6) Open book regarding the Contractor's cost data * (5+8) No unexpected or contentious claims, there is not that contractual drive for the Contractor to make more money and for the Employer to keep the budget tight. * (5+6) CEs are purely for the works, which takes the programme implications out of contention * (5) Formal and informal early warning meetings (5) The pain/gain share mechanism has influence on how CEs are viewed. A 'gain' situation allows more freedom for the parties to be a bit more forgiving. (6) The parties are in a 'gain' situation due to negative CEs as a result of unexpected gains and value engineering	(3+10) The Employer did not have many resources (e.g. sanctions or incentives) to control the Contractor ↓ (9) A lot of informal communication at all levels on a day-to-day basis by means of the fulltime co-location (10) Some management meetings to resolve problems, but sometimes it was difficult to make a compromise. Therefore, it came down to a 'like it or lump it' approach for the Employer ↓ (5) No true collaboration and help to resolve problems, but only informal discussion about claims and the draft determination ↓ (5+8) There was a general willingness to move the project forward on all sides, but the parties merely performed their obligations under the contract to achieve this, rather than really to collaborate together ↓ (5+8) The Contractor submitted some unexpected, unjustified or unreasonably priced variations requests and claims ↓↓ (6) The combination D&B contract, measurable quantities and a maximum budget required a lot of work from the Engineer as it may have given rise to problems (e.g. overdimensioning and scope reduction) ↓ (10) External input from Engineer's and Contractor's organizations to resolve problems	(3) Focus on the target in terms of costs and programme by means of incentives and sanctions (9) A lot of informal communication at all levels on a day-to-day basis by means of the fulltime co-location (5) Mutual formal and informal early warnings (5+9) Informal discussion and agreement prior to sending the formal documents (6) Clear risk allocation (6) The pain/gain share mechanism to share the financial risk between the parties and to promote good performance (10) Timely joint problem-solving at the right level (5+8+x) The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides ↓ (5) Collaboration and mutual help to resolve mutual problems in order to achieve the common project objectives (5) Open book regarding the Contractor's cost data (5/8) No unexpected, unjustified and unreasonably priced claims (5) Only include the direct costs of the works in the claim and reimburse the indirect cost separately (5) Formal and informal early warning meetings
Product	(3) The Contractor adheres to the quality management system (3+8) The Contractor is delivering a good product (3+x) WIN for all parties and understand each other's interests (3+8) Informal incentive for the Subcontractor (prestigious project), so not merely wants to make profit	* (3+5+8) The Employer wants a higher quality product than the Contractor is delivering, therefore the Employer often refers to the contract (3) Win-partial win situation due to lowest price tender ↓ (3+5+8) No other mutual objectives besides fitness for purpose, therefore the objectives remained contradictory ↓	(3) The Project Team is delivering the project within time and budget * (3) WIN for all parties on the project and in the long term * (3) Achievable and realistic mutual project objectives derived from the mutual objectives in the long term * (3+6) Other common objectives: partnering over a 15-year period (maintenance of the relationship) and working together on the next flood scheme (all flood schemes are CEs, which promotes good performance)		(3) The Contractor is delivering a high quality product within time and budget (3) WIN situation for all parties involved (3) Achievable and realistic mutual project objectives besides 'fitness for purpose' which are more important the parties' own objectives

38. Comparison projects: Overview of the trust building aspects

- = not stated in the project records or mentioned during the interviews

N/A = not applicable

↓ = could be better to create trust

↓↓ = creating distrust

Bold = condition of contract

Italic = amendment to contract

* in Drachtsterweg project = influenced by the Employer's traditional way of acting

* in Forres project = influenced by the strategic partnering

* in Dikkowita project = influenced by culture

GREY = most effective for creating trust or distrust

At least two aspects the same on the projects means it is important, so these will be included in the 'comparison table'. If they also happen to be highlighted grey, they will also be grey in the 'comparison' table. The author can also override this rule if an aspect seems to be really important and needs to be included in the 'comparison' table. Such aspects will be highlighted black.

Trust criteria	Bijlmerweide	Drachtsterweg	Forres	Dikkowita	Comparison
(1) Trustworthiness of organization and the person during procurement: Track record, reputation, competences (financial, technical)	-	-	(x) Client leadership in promoting the collaborative approach	(1) The Contractor took initiative to get the funding together to start up the project	(1) Client or Contractor leadership
	(1+2) Direct agreement procedure, National tender. The Employer was allowed to select the contractors of his own choice (1+2) Pre-selection was not aimed at specialist contractors	(1) Restricted procedure, European tender ↓	*(1+2) Best value procurement, European tender	(1) Direct negotiations	(1+2) The possibility to select the winning tender on the basis of the assessment of the Contractor's trustworthiness (ability, benevolence, integrity, predictability and reliability)
(2) Trustworthiness during procurement: Culture, policy	(1) The tender team is the same as the project implementation team (1) Requirements on the personal level were merely based on the technical competences ↓	(1) The tender team is not the same as the project implementation team ↓ (1) The Employer did not have any requirements regarding the Contractor's team and did not request CVs ↓ (1) The Contractor's goodwill was tested during the individual information exchange rounds, but these rounds did not have an influence on awarding the contract and created distrust between the parties ↓↓	*(1+2) The Employer was looking for local representation and a Contractor with long-term employees and wanted to meet the project implementation team rather than the marketing team	(1) The tender team was not the same as the project implementation team, partly because the project started three years after the procurement ↓ (1) The Employer did not have any requirements regarding the Contractor's team ↓	(1) The involvement of the project implementation team in the tender phase to check whether they are able and willing to work in accordance with how the Employer's way of working.
	(1) Requirements on the organizational level were merely based on the technical competences ↓ (1) MEAT award criterion: only based on price and quality ↓	(1) Requirements on the organizational level were merely based on the technical and financial competences and were quite standard ↓ (1) MEAT award criterion was not applied correctly and did not include the technical proposals, as a result it became a lowest price procurement ↓↓	*(1+2) Multiple selection and award criteria from long-term perspective. The organizational culture, the competences and the benevolence were paramount.	(1) Requirements on the organizational level were merely based on the technical competences ↓ (1) No other award criteria, besides cost and quality ↓	(1) Selection requirements on the organizational level based on the technical and financial competences ↓ (1) The use of the MEAT award criterion: price and quality. (2) The use of other criteria: the Contractor's organizational culture and benevolence
	(1) No significant amendments to the UAC-IC 2005	(1+5) 'Like it or lump it' contract which contains many amendments ↓↓	(1+6) Negotiated contract	(1) Negotiated contract	(1) No significant amendments to the standard form of contract or a negotiated contract
(3) Joint goal setting	(3) Focus on the target in terms of the programme mainly due to strict deadlines and fines.	(3) Focus on the target in terms of the programme mainly due to bonuses and fines	(3+6) Focus on the target in terms of the costs and programme mainly due to the pain/gain share mechanism	(3) Focus on the target in terms of the programme mainly due to the funding of the project (3+10) The Employer did not have many resources (e.g. sanctions or incentives) to control the Contractor ↓	(3) Focus on the target in terms of costs and programme by means of incentives and sanctions
	(3+x) WIN for all parties and understand each other's interests	(3) Win-partial win situation due to lowest price tender ↓	*(3) WIN for all parties on the project and in the long term	(3) At the end of the project, there was most likely no WIN situation for all parties anymore due to the scope change (i.e. harbour also suitable for large ships)	(3) WIN situation for all parties involved

				and the disputed bridge-road connection ↓	
	(3+8) Informal incentive for the Subcontractor (prestigious project), so not merely wants to make profit (3+8) The likelihood of future co-operations	-	*(3+6) Other common objectives: partnering over a 15-year period (maintenance of the relationship) and working together on the next flood scheme (all flood schemes are CEs, which promotes good performance)	-	(3+8) Other common objectives: maintenance of the relationship to increase the likelihood of future co-operations.
	(3) The Contractor adheres to the quality management system	-	-	-	N/A
	(3+8) The Contractor is delivering a good product	*(3+5+8) The Employer wants a higher quality product than the Contractor is delivering, therefore the Employer often refers to the contract	(3) The Project Team is delivering the project within time and budget	(3) The Contractor was delivering a high quality product	(3) The Contractor is delivering a high quality product within time and budget
	(3) No other mutual objectives besides fitness for purpose ↓	(3+5+8) No other mutual objectives besides fitness for purpose, therefore the objectives remained contradictory ↓	*(3) Achievable and realistic mutual project objectives derived from the mutual objectives in the long term (3) The Contractor's standard of care is limited to reasonable skill and care due to E&C contract	(3) No other mutual objectives besides fitness for purpose ↓	(3) Achievable and realistic mutual project objectives besides 'fitness for purpose' which are more important the parties' own objectives
	-	(3) The overlap between the design phase and the construction phase does not run smoothly ↓	(3) The works were not fully designed at the time of target setting ↓	-	(3) The transition between the design phase and the construction phase does not run smoothly ↓
	(3+8) No collaboration agreements ↓	(3+8) The collaboration agreements (openness, focus on the target, timeliness etc.) are quite standard and are not fully effective due to contradictory interests ↓	(3+8) The Project Charter only has an indirect influence through the people who signed it ↓	*(3+8) No collaboration agreements ↓	(3+8) No collaboration agreements or no full adherence to them ↓
	N/A	N/A	N/A	(3) Major scope change at the beginning and the 'final scope agreement' was only reached near the end of the project ↓	N/A
	N/A	N/A	N/A	(3+10) The Contractor withdrew from the bridge-road solution and did not finish the job ↓	N/A
(4) Clearly defined communication system	(4) Clear communication system	(4) Clear communication system	*(4) Clear and extensive communication system	(4) Clear communication system	(4) Clear communication system
	(4) Use of a shared Document Management System	(4) Use of a shared Document Management System	(4) The DMS (Box) is not shared with the Contractor ↓	(4) Use of a shared Document Management System	(4) The use of a shared Document Management System
	(4) Only a standard form and register for variations	(4) Basic use of standard forms and registers	*(4) Extensive use of standard forms and project registers	(4) Extensive use of standard forms and registers	(4) The use of standard forms and registers
	-	-	(4/5) Communication (e.g. for CEs) according to the NEC2 ECC creates an extensive audit trail, but it increases the administrative burden for all parties, therefore the period of reply is not always met. There is no sanction either ↓	(4) In the Particular Conditions, the period of reply for some specific matters were halved compared to the General Conditions, which increased the administrative burden for the Engineer ↓	(4/5) Increased administrative burden for certain or all parties due to fixed period of reply ↓
(5) Joint problem-solving	(5+9) Informal discussion and agreement prior to sending the formal documents	(5+9) Separate formal problem-solving meetings for risks, technical and contractual aspects and 1-on-1 informal meetings.	(5+9) Informal discussion and agreement prior to sending the formal documents	(5+9) Informal claims discussions and draft determination not always effective ↓	(5+9) Informal discussion and agreement prior to sending the formal documents

	(5) Limited co-operation and mutual help to resolve problems ↓	(5) Collaboration and help to resolve mutual problems and Contractor's problems is not always effective ↓	(5+x) Working together and solving problems as a team and challenge each other to achieve the common project objectives	(5) No true collaboration and help to resolve problems, but only informal discussion about claims and the draft determination ↓ (5+8) There was a general willingness to move the project forward on all sides, but the parties merely performed their obligations under the contract to achieve this, rather than really to collaborate together ↓	(5) Collaboration and mutual help to resolve mutual problems in order to achieve the common project objectives
	N/A	N/A	*(5+6) Open book regarding the Contractor's cost data	N/A	(5) Open book regarding the Contractor's cost data
	N/A	N/A	*(5) The Project Manager can act impartial and fair by means of help from the Independent Cost Consultant, as he draws up the quotation for CEs	(5+8) The Engineer's dual role (i.e. act reasonable and impartial and on behalf of the Employer) ↓↓	(5) The Employer's agent can act impartial and fair by means of help from an Independent Cost Consultant, as he draws up the quotation for claims
	-	(5/8) Sometimes the Contractor issues questionable variations ↓↓	*(5+8) No unexpected or contentious claims, there is not that contractual drive for the Contractor to make more money and for the Employer to keep the budget tight.	(5+8) The Contractor submitted some unexpected, unjustified or unreasonably priced variations requests and claims ↓↓	(5/8) No unexpected, unjustified and unreasonably priced claims
	-	-	*(5+6) CEs are purely for the works, which takes the programme implications out of contention	-	(5) Only include the direct costs of the works in the claim and reimburse the indirect cost separately
	-	-	*(5) Formal and informal early warning meetings	-	(5) Formal and informal early warning meetings
	(5) Only informal EWs with no sanctions ↓	*(5) The Contractor fails to give EWs, whereas the Employer gives many EWs, but these are unwanted ↓	*(5) Mutual formal and informal early warnings	(5) No true early warning, but only early notification of claims ↓	(5) Mutual formal and informal early warnings
	-	-	(5) Clear, extensive and streamlined CEs procedure	(5) Clear claims procedures	(5) Clear and efficient claims procedure
	-	(5+8+x) The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides ↓	-	-	(5+8+x) The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides ↓
	-	(5+8) The Employer is quite reluctant to accept claims related to the Employer's Requirements ↓↓	-	-	(5+8) The Employer is quite reluctant to accept claims related to the Employer's Requirements ↓↓
	-	-	-	(5) The timelines tended to drift after notification of claims because the Contractor wants to have a better overview of the full impact of the claims ↓	N/A
(6) Equitable risk allocation	(6) To a large extent, the risks are allocated to the party best able to manage them	(6) Risks are allocated to the party best able to manage them, except for the geotechnical conditions ↓	(6) Joint risk workshop to tailor the risk register specific to the project and to allocate the risks to the party best able to manage them. The Employer's risk allowance covers unforeseen risks.	(6) The risks were allocated to the party best able to manage them.	(6) Allocation of risks to the party best able to manage them
	(6) Ultimate risk allocation is unclear due to the risk registers ↓	(6) Ultimate risk allocation is unclear due to good faith ↓	(6) Clear risk allocation	(6) Clear risk allocation	(6) Clear risk allocation

		(5+6) Disagreement about the responsibility of the unexpected geotechnical conditions ↓↓			
	(6) Only a small risk allowance for the Contractor's risks ↓	(6) The Contractor could not include all his risks in the risk allowance due to the lowest price tender ↓	(6) The Contractor's risk allowance was negotiated and is part of the pain/gain share mechanism	(6) The Contractor most likely did include a risk allowance to his tender price, because there were no competitors	(6) Appropriate risk allowance for the Contractor's risks
	(6) No risk sharing ↓↓	(6) No risk sharing ↓↓	* (6) The financial risk is shared by means of a pain/gain share mechanism, which promotes the partnership and encourages the Contractor to be innovative and efficient in order to create a 'gain' for all parties	(6) No risk sharing ↓↓	(6) The pain/gain share mechanism to share the financial risk between the parties and to promote good performance
	N/A	N/A	N/A	(6) The combination D&B contract, re-measurable quantities and a maximum budget required a lot of work from the Engineer as it may have given rise to problems (e.g. overdimensioning and scope reduction) ↓	N/A
(7) System for continuous improvement of the relationship	(7+11) The relationship improves informally ↓↓	(7+11) The PFUs are not optimal and fully effective. The issues discussed at the PFUs are not resolved and are not dealt with afterwards ↓	(7+11+x) The relationship improves informally on a day-to-day basis by means of the co-location and social events. There are also formal joint lessons learned workshops, but these are not held during the project ↓	(7+11) The relationship improves informally on a day-to-day basis by means of the co-location and social events ↓↓	(7+11) Formal PFUs are not fully effective if the parties are not willing to give in. It is better to improve the relationship informally on a day-to-day basis by means of a full-time co-location ↓
(11) Emotional investments	-	*(11) Disagreement about the interpretation of the D&C contract (i.e. the Employer's role and the design freedom) ↓↓	-	-	N/A
(8) Reasonable behaviour	(8) Reduced work indicated as well	-	(5) The pain/gain share mechanism has influence on how CEs are viewed. A 'gain' situation allows more freedom for the parties to be a bit more forgiving. (6) The parties are in a 'gain' situation due to negative CEs as a result of unexpected gains and value engineering	-	(8) The Contractor does not merely issue additional work, but also indicates of reduced work
	(8) The Contractor's goodwill, passion and motivation to deliver a good project	-	-	(8) Both parties had confidence in each other's ability to perform	(8) Confidence in each other's ability to perform and to deliver a good project
	(8) Reasonable and fair behaviour of both parties	(8) 'Us versus them' behaviour and no mutual reasonable and fair behaviour at the lowest level ↓	(8) By large, all parties understand the meaning of good faith and act in good faith	(8) 90% of the time the parties were friendly towards each other, but 10% of the time the Employer and the Contractor were mainly trying to defend their ground as good as they can. (8) The Contractor's contract manager was obstructive to moving things forward ↓	(8) Reasonable and fair behaviour of both parties at all levels, at all times and throughout the whole project
	-	-	(8+x) The Contractor has set up and organized his management team by checking if people are capable and willing to work in accordance with that 'spirit of mutual trust and co-operation'. It comes down to the individuals involved.	-	(8) The selection of people who are capable and willing to work in accordance with the Employer's way of working because it comes down to the individuals involved

	N/A	N/A	*(8+x) Past co-operations on the other flood schemes and previous joint lessons learned workshops	N/A	N/A
	N/A	N/A	*(8+x) Continuity of staff in all parties	N/A	N/A
	N/A	N/A	(8) The Project Manager may instruct the Contractor to replace an employee	(8) The Engineer may instruct the Contractor to replace an employee	(8) The Employer's agent may instruct the Contractor to replace an employee
	(8) Good faith in the DCC has no direct influence ↓	(8) Good faith in the DCC only has influence at the highest escalation level ↓	(8) Good faith in Scots law only has an indirect influence on the behaviours through culture ↓	(8) The principle of good faith in the law is not applicable on site, partly because of the international contract environment, but it only becomes important in case of arbitration or litigation ↓↓	(8) Good faith in the laws has no direct influence ↓
	-	(8) Good faith in the UAC-IC 2005 covers the implicit requirements of the contract, but may lead to disagreements as it is open to interpretation ↓	(8) Mutual trust and co-operation clause in the NEC2 ECC is not effective in itself, but forms a good basis for building trust. The intention of the clause is clear, but it remains open to interpretation and cannot be enforced ↓	-	(8) Good faith in contracts is essential to cover implicit requirements in the contract, but it may also lead to distrust as it is open to interpretation ↓
(9) Repeated fulfilment of communications and interactions	(9) A lot of informal communication by means of phone, email, visits etc.	(9) Less informal contact due to part-time co-location ↓	*(9) A lot of informal contact on a day-to-day basis by means of the fulltime co-location	(9) A lot of informal communication at all levels on a day-to-day basis by means of the fulltime co-location *(9) Less interaction between the expats and the Sri Lankans ↓	(9) A lot of informal communication at all levels on a day-to-day basis by means of the fulltime co-location
	-	(9) Regular informal meetings and PFUs	-	-	N/A
(10) Problem-solving at the lower levels	(10) Timely joint problem-solving at the lowest levels	(10) Most problems concern money and can only be resolved at the highest level ↓ (10) Some problems could not be resolved at the lowest level ↓	(10) All problems were resolved by amicable agreement within the Project Team	(10) Some management meetings to resolve problems, but sometimes it was difficult to make a compromise. Therefore, it came down to a 'like it or lump it' approach for the Employer ↓	(10) Timely joint problem-solving at the right level
	(10) Disputes cannot be referred to the DAB or arbitration, but only to the court ↓	(10) Disputes cannot be referred to the DAB or arbitration, but only to the court ↓	(10) The Adjudicator was appointed prior to the start of the project	(10) Post-dispute DAB ↓	N/A
	-	-	-	(10) External input from Engineer's and Contractor's organizations to resolve problems	N/A
(x) Other components	(x) The way the Contractor deals with the stakeholders	-	(x) Corporate social responsibility and the way the Project Team deals with the Council.	-	(x) The way the Contractor deals with the stakeholders
	-	*(x) The parties do not involve the other party in the processes and the decision-making (i.e. provide more insight into how things come into being) ↓	-	-	N/A

39. Comparison projects: Overview of the efficiency and effectiveness creating aspects

- = not stated in the project records or mentioned during the interviews

N/A = not applicable

↓ = could be better to create an efficient and effective change management process

↓↓ = creating an efficient and effective change management process

Bold = condition of contract

Italic = amendment to contract

* in Drachtsterweg project = influenced by the Employer's traditional way of acting

* in Forres project = influenced by the strategic partnering

* in Dikkowita project = influenced by culture

GREY = most effective for creating an efficient and effective change management process

At least two aspects the same on the projects means it is important, so these will be included in the 'comparison table'. If they also happen to be highlighted grey, they will also be grey in the 'comparison' table. The author can also override this rule if an aspect seems to be really important and needs to be included in the 'comparison' table. Such aspects will be highlighted black.

CM criteria	Bijlmerweide	Drachtsterweg	Forres	Dikkowita	Comparison
(1) Joint goal setting for change management & risk management	(1) Change management objectives aligned regarding the procedure, but not regarding the results ↓	(1) Change management objectives aligned regarding the procedure, but not regarding the results ↓	(1) Change management objectives were aligned regarding the procedure and the results (e.g. distinction between 'preferred' and 'necessary' design changes) (1) The parties did not fully adhere to the change management objectives ↓ (1) The works were not fully designed at the time of target setting ↓	(1) Change management objectives were aligned regarding the procedure and the results	(1) Change management objectives were aligned regarding the procedure and the results
	-	-	(1) Early Contractor Involvement in the design phase	-	N/A
	(1) No mutual risk management objectives regarding the results ↓	(1) No mutual risk management objectives regarding the results ↓	(1) Risk management objectives were aligned	(1) No mutual risk management objectives regarding the procedure and the results ↓↓	(1) Risk management objectives were aligned regarding the procedure and the results
(2) Clearly defined change management procedure and roles or responsibilities therein	(2) <i>Clear and efficient change management procedure</i>	(2) <i>Clear and efficient change management procedure</i>	(2) Clear, extensive and streamlined change management procedure	(2) Clear change management procedure	(2) Clear and efficient change management procedure
	(2) Use of standard form and change register	(2) Use of standard form and change register	* (2) Extensive use of standard forms and project registers	(2) Use of standard form and change register	(2) Use of standard forms and change register
	-	-	(2) Use of provisional allowance for certain design elements	-	N/A
	N/A	N/A	(2) Project Manager has control over all changes as they all stem from Project Manager's Instructions	(2) Due to the mutual change management objective to stay within the budget, the Engineer was not authorized to give instructions for variations, which had a paralyzing effect on his job and slowed things down ↓	(2) The Employer's agent is authorized to give instructions for variations, and has control over all variations as they all stem from these instructions.
	N/A	N/A	(2) Open book regarding the Contractor's cost data	N/A	(2) Open book regarding the Contractor's cost data
	N/A	N/A	(2) The Project Manager can act impartial and fair by means of help from the Independent Cost Consultant, as he draws up the quotation for variations	(2) The Engineer's dual role (i.e. act reasonable and impartial and on behalf of the Employer) ↓↓	(2) The Employer's agent can act impartial and fair by means of help from an Independent Cost Consultant, as he draws up the quotation for variations
(3) Equitable risk allocation	(3) To a large extent, the risks are allocated to the party best able to manage them	(3) Risks are allocated to the party best able to manage them, except for the geotechnical conditions ↓	(3) Joint risk workshop to tailor the risk register specific to the project and to allocate the risks to the party best able to manage them. The Employer's risk allowance covers unforeseen risks.	(3) The risks were allocated to the party best able to manage them.	(3) Allocation of risks to the party best able to manage them
	(3) Ultimate risk allocation is unclear ↓	(3) Ultimate risk allocation is unclear due to good faith ↓	(3) Clear risk allocation	(3) Clear risk allocation	(3) Clear risk allocation

		(3) Disagreement about the responsibility of the unexpected geotechnical conditions ↓↓			
	(3) Only a small risk allowance for the Contractor's risks ↓	(3) The Contractor could not include all his risks in the risk allowance due to the lowest price tender ↓	(3) The Contractor's risk allowance was negotiated and is part of the pain/gain share mechanism	(3) The Contractor most likely did include a risk allowance to his tender price, because there were no competitors	(3) Appropriate risk allowance for the Contractor's risks
	(3) No risk sharing ↓↓	(3) No risk sharing ↓↓	*(3) The financial risk is shared by means of a pain/gain share mechanism, which promotes the partnership and encourages the Contractor to be innovative and efficient in order to create a 'gain' for all parties	(3) No risk sharing ↓↓	(3) The pain/gain share mechanism to share the financial risk between the parties
	N/A	N/A	N/A	(3) The combination D&B contract, re-measurable quantities and a maximum budget required a lot of work from the Engineer as it may have given rise to problems (e.g. overdimensioning and scope reduction) ↓	N/A
(4) Risk management system	(4) Limited joint risk management procedure and roles therein are unclear ↓	(4) Clear risk management procedure	(4) Clear risk management procedure	(4) Limited joint risk management procedure ↓	(4) Clear risk management procedure
	(4) Both parties are responsible for their own risk management ↓	(4) Both parties are responsible for their own risk management, but the Employer helps out if needed ↓	(4) Joint risk management of the Employer's risks	(4) Both parties are responsible for their own risk management. No insight into each other's risk management processes ↓	(4) Joint risk management of the Employer's risks
	-	-	(4) Risk management used to predict the costs to complete and the financial outcome of the project.	-	(4) Risk management used to predict the costs to complete and the financial outcome of the project.
	(4) Overall risk management approach is half reactive/half proactive to largely proactive ↓	(4) The risk management approaches of both parties were not aligned ↓	(4) Overall risk management approach is aligned and is largely proactive, and depends on the people involved.	(4) The risk management approaches of both parties were not aligned. ↓	(4) Overall risk management approach is aligned between the parties and is proactive.
	(4) Risk management is not closely related to change management ↓	(4) Risk management is not closely related to change management	(4) Risk management is closely related to change management	(4) Risk management is not closely related to change management ↓	(4) Risk management is closely related to change management
(5+6) Learning from changes and sharing this knowledge	(5+6) The parties do not create lessons learned specifically from change events, learning from changes happens informally and unknowingly. The parties only audit the adherence to the risk management procedure ↓↓	(5+6) The parties do not create lessons learned specifically from change events, learning from changes happens informally and unknowingly. The parties only audit the adherence to the risk management procedure ↓↓	(5+6) The parties do not create lessons learned specifically from change events, but there are overall joint lessons learned workshops. The risk management performance is regularly measured by means of measuring the financial and time performance of the project ↓	(5+6) The parties do not create lessons learned specifically from change events, learning from changes happens informally and unknowingly. The parties do not measure the risk management performance ↓↓	(5+6) The parties do not create lessons learned specifically from change events ↓
(7) Early warning	(7) Overall change management approach is largely proactive	(7) Overall change management approach is half reactive/half proactive to largely proactive ↓	(7) Overall change management approach is aligned and is largely proactive, and depends on the people involved.	(7) The change management approaches of both parties were not aligned ↓	(7) Overall change management approach is aligned between the parties and is proactive.
	(7) Discuss variations informally prior to the formal procedure	(2+x) Discuss variations informally or during the separate regular variations meeting prior to the formal procedure and send a draft change order by email first	(7) Discuss variations informally prior to the formal procedure	(7) Informal discussion of variations and draft determination first	(7) Discuss variations informally prior to the formal procedure and draft change order first

	(7) Early informal notification of variation by means of phone call or email	(7) EWs given by the Employer are not appreciated ↓ <i>(7) The standard warning obligation and the extra warning obligation are not fully effective ↓↓</i>	<i>(7) Mutual formal and informal early warning obligation for variations due to risks and errors in documents</i>	(7) Only early identification of potential variations by means of the notification of claims ↓	(7) Mutual formal and informal early warning obligation for variations due to risks and errors in documents
(7-16) Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.	(7-16) Overall the change management procedure is not followed as consistent as should be in order to increase efficiency ↓	<i>(7-16) Mostly, the change management procedure is followed as consistent as should be</i>	<i>(7-16) Overall, the change management procedure is followed as consistent as should be</i>	<i>(7-16) Overall, the change management procedure is followed as consistent as should be</i>	(7-16) Overall, the change management procedure is followed as consistent as should be
	(7-16) Efficient change management process as most variations are relatively small	(7-16+x) The change management process is not very efficient due to disagreements about the price at the lowest level and the escalations or because the Contractor did not put the variation yet ↓	-	(7-16) Timelines tended to drift a little after the initial notification because the Contractor wants to have a better overview of the full impact of the variation ↓	(7-16) Efficient change management process due to insight into the full impact of the variation and quick agreement on the price.
	-	(7-16) Sometimes the Contractor issues questionable variations ↓↓	(7-16) No unexpected or contentious variations, there is not that contractual drive for the Contractor to make more money and for the Employer to keep the budget tight.	(7-16) The Contractor submitted some unexpected, unjustified or unreasonably priced variations requests and claims ↓↓	(7-16) No unexpected, unjustified and unreasonably priced variations
	(7-16) Standard change management processes are applied to a large extent ↓	(7-16) Standard change management processes are applied to a large extent ↓	(7-16) Standard change management processes are applied to a large extent ↓	(7-16) Standard change management processes are applied to a large extent ↓	(7-16) Standard change management processes are applied to a large extent ↓
	-	-	<i>(7-16)+T(4) The processing of CEs according to the NEC2 ECC increases the administrative burden for all parties, therefore the period of reply of CEs is not always met ↓</i>	-	<i>(7-16) Increased administrative burden for certain or all parties due to fixed period of reply ↓</i>
	-	-	-	<i>(7-16) Variations process not as efficient due to the project funding, the maximum budget and the required agreement between the Employer and the Contractor ↓</i>	N/A
(8-9+15-16) Appropriate documentation of the change process	(15) Use of standard forms and change register to create a basic audit trail ↓	(15) Use of standard forms and change register to create a basic audit trail ↓	(15) Use of standard forms and project registers to create an extensive audit trail	(15) Use of standard forms and change register to create a basic audit trail ↓	(15) Use of standard forms and project registers to create a basic to extensive audit trail
(x) Other components	(x) Trust between the parties	-	-	-	(x) Trust between the parties
	(x) Clearly defined verification and validation system as many variations occur in the quality management processes	(x) Clearly defined verification and validation system as many variations occur in the quality management processes	-	-	(x) Clearly defined verification and validation system as many variations occur in the quality management processes
	-	(x) Separate regular variations meetings	-	-	(x) Separate regular variations meetings

40. Comparative analysis: Overview of the data

40.1 Overview of trust building aspects

Table 119: Overview of trust building aspects contrasted

Trust criteria	Comparison
(1) Trustworthiness of organization and the person during procurement: Track record, reputation, competences (financial, technical)	(1) Client or Contractor leadership (1+2) The possibility to select the winning tender on the basis of the assessment of the Contractor's trustworthiness (ability, benevolence, integrity, predictability and reliability) (1) The involvement of the project implementation team in the tender phase to check whether they are able and willing to work in accordance with how the Employer's way of working.
(2) Trustworthiness during procurement: Culture, policy	(1) Selection requirements on the organizational level based on the technical and financial competences ↓ (1) The use of the MEAT award criterion: price and quality. (2) The use of other criteria: the Contractor's organizational culture and benevolence (1) No significant amendments to the standard form of contract or a negotiated contract (3) Focus on the target in terms of costs and programme by means of incentives and sanctions
(3) Joint goal setting	(3) WIN situation for all parties involved (3+8) Other common objectives: maintenance of the relationship to increase the likelihood of future co-operations. (3) The Contractor is delivering a high quality product within time and budget (3) Achievable and realistic mutual project objectives besides 'fitness for purpose' which are more important the parties' own objectives (3) The transition between the design phase and the construction phase does not run smoothly ↓ (3+8) No collaboration agreements or no full adherence to them ↓
(4) Clearly defined communication system	(4) Clear communication system (4) The use of a shared Document Management System (4) The use of standard forms and registers (4+5) Increased administrative burden for certain or all parties due to fixed period of reply ↓
(5) Joint problem-solving	(5+9) Informal discussion and agreement prior to sending the formal documents (5) Collaboration and mutual help to resolve mutual problems in order to achieve the common project objectives (5) Open book regarding the Contractor's cost data (5) The Employer's agent can act impartial and fair by means of help from an Independent Cost Consultant, as he draws up the quotation for claims (5+8) No unexpected, unjustified and unreasonably priced claims (5) Only include the direct costs of the works in the claim and reimburse the indirect cost separately (5) Formal and informal early warning meetings (5) Mutual formal and informal early warnings (5) Clear and efficient claims procedure (5+8+x) The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides ↓ (5+8) The Employer is quite reluctant to accept claims related to the Employer's Requirements ↓↓
(6) Equitable risk allocation	(6) Allocation of risks to the party best able to manage them (6) Clear risk allocation (6) Appropriate risk allowance for the Contractor's risks (6) The pain/gain share mechanism to share the financial risk between the parties and to promote good performance
(7) System for continuous improvement of the relationship (11) Emotional investments	(7+11) Formal PFUs are not fully effective if the parties are not willing to give in. It is better to improve the relationship informally on a day-to-day basis by means of a full-time co-location ↓
(8) Reasonable behaviour	(8) The Contractor does not merely issue additional work, but also indicates of reduced work (8) Confidence in each other's ability to perform and to deliver a good project (8) Reasonable and fair behaviour of both parties at all levels, at all times and throughout the whole project (8) The selection of people who are capable and willing to work in accordance with the Employer's way of working because it comes down to the individuals involved (8) The Employer's agent may instruct the Contractor to replace an employee (8) Good faith in the laws has no direct influence ↓ (8) Good faith in contracts is essential to cover implicit requirements in the contract, but it may also lead to distrust as it is open to interpretation ↓
(9) Repeated fulfilment of communications and interactions	(9) A lot of informal communication at all levels on a day-to-day basis by means of the fulltime co-location
(10) Problem-solving at the lower levels	(10) Timely joint problem-solving at the right level
(x) Other components	(x) The way the Contractor deals with the stakeholders

BOLD = (Related to) condition of contract, ITALIC = Amendment to contract, GREY = Important aspect, BLACK = Important aspect according to the author

40.2 Overview of efficiency and effectiveness creating aspects

Table 120: Overview of efficiency and effectiveness creating aspects contrasted

CM criteria	Comparison
(1) Joint goal setting for change management & risk management	(1) Change management objectives were aligned regarding the procedure and the results
(2) Clearly defined change management procedure and roles or responsibilities therein	(1) Risk management objectives were aligned regarding the procedure and the results
	(2) Clear and efficient change management procedure
	(2) Use of standard forms and change register
	(2) The Employer's agent is authorized to give instructions for variations, and has control over all variations as they all stem from these instructions.
	(2) Open book regarding the Contractor's cost data
	(2) The Employer's agent can act impartial and fair by means of help from an Independent Cost Consultant, as he draws up the quotation for variations
(3) Equitable risk allocation	(3) Allocation of risks to the party best able to manage them
	(3) Clear risk allocation
	(3) Appropriate risk allowance for the Contractor's risks
	(3) The pain/gain share mechanism to share the financial risk between the parties
(4) Risk management system	(4) Clear risk management procedure
	(4) Joint risk management of the Employer's risks
	(4) Risk management used to predict the costs to complete and the financial outcome of the project.
	(4) Overall risk management approach is aligned between the parties and is proactive.
	(4) Risk management is closely related to change management
(5+6) Learning from changes and sharing this knowledge	(5+6) The parties do not create lessons learned specifically from change events ↓
(7) Early warning	(7) Overall change management approach is aligned between the parties and is proactive.
	(7) Discuss variations informally prior to the formal procedure and draft change order first
	(7) Mutual formal and informal early warning obligation for variations due to risks and errors in documents
(7-16) Standard processes: Assess potential impact, determine priority, change options, assess impact, decision-making, communicate decision and monitor change.	(7-16) Overall, the change management procedure is followed as consistent as should be
	(7-16) Efficient change management process due to insight into the full impact of the variation and quick agreement on the price.
	(7-16) No unexpected, unjustified and unreasonably priced variations
	(7-16) Standard change management processes are applied to a large extent ↓
	(7-16) Increased administrative burden for certain or all parties due to fixed period of reply ↓
(8-9+15-16) Appropriate documentation of the change process	(15) Use of standard forms and project registers to create a basic to extensive audit trail
(x) Other components	(x) Trust between the parties
	(x) Clearly defined verification and validation system as many variations occur in the quality management processes
	(x) Separate regular variations meetings

BOLD = (Related to) condition of contract, ITALIC = Amendment to contract, GREY = Important aspect, BLACK = Important aspect according to the author

40.3 Overview of influence trust on the change management process

Table 121: Overview of influence trust on the change management process contrasted

Indirectly influenced by trust (Trust is needed to...)
Apply the CM procedure correctly
*Apply the RM procedure correctly
*Align the CM objectives
*Align the RM objectives
*Agree on the risk allocation
Directly influenced by trust (If there is trust/distrust...)
*Open and informal communication structure > early notification of potential variations by both parties
*Common project objectives and focus on the target > early notification of potential variations by both parties
Deviate from formal procedure (i.e. submit change order afterwards in order to increase efficiency)
More flexibility in decision-making about 'grey' variations
WIN situation for the Contractor > No unexpected, unjustified and unreasonably priced claims and variations
Collaboration and mutual help to resolve mutual problems in order to achieve the common project objectives
*No doubts about the Employer's agent's dual role (i.e. as a certifier and the employer's agent) > no escalations needed
*The escalation model does not work optimally due to discussions at the wrong level, untimely escalations and the different mandate regulations at both sides ↓
Inefficient change management process due to no insight into the full impact of the variation and no quick agreement on the price ↓
*More communication by email instead of informal visits in order to confirm things ↓
According to the given answers (If there is trust...)
Average score by the interviewees: 75% of the efficiency is influenced by trust
Efficiency: no unjustified, unexpected and unreasonably priced variations, therefore less substantiation needed, less time needed to check the variation and its impact and quicker acceptance of the fact that it is a variation to the contract as the Employer does not expect to find any problems.
Efficiency: the Employer is going to trust that the Contractor has focus on the target and is going to manage it efficiently using the right resources and the right time to keep things moving (e.g. to increase efficiency, continue the works and submit change orders afterwards)
Efficiency: the parties are willing to co-operate and there will be less disputes, because you will put more effort into what is important (i.e. the big figures) and less emphasis on the small stuff.
Average score by the interviewees: 50% of the effectiveness is influenced by trust
Effectiveness: 0% influenced, parties are obliged to follow the variations procedure (it has to be a good procedure though).
Effectiveness: 0% influenced, the Contractor will follow the variations procedure anyway, because variations generate income.
Effectiveness: the parties will follow the variations procedure correctly.
Effectiveness: 0% influenced, the decision as to whether something is a variation to the contract does not depend on trust.
Effectiveness: The Contractor will more likely submit a right and verifiable change option and impact (trust based on competences and experience) and the Employer has less doubts about whether it is a right change option and whether it adds value, so he is more likely to accept it as he believes that the Contractor's judgement is correct and that the Contractor's goal is at his best interests.
Effectiveness: the Contractor is working towards the same goal or outcome for changes, so he does not submit unjustified, unreasonable and unexpected variations.
Effectiveness: Both parties will believe that the other will meet their expectations and is delivering what he should in terms of the project
Effectiveness: no need for grey compromises (if there is disagreement about whether something is a variation to the contract)
Effectiveness: the parties are less reluctant to agree to the variation, to believe that it is a variation to the contract, to co-operate and to deal with the variation. By means of collaboration (i.e. co-operation and thinking along) it is easier to achieve a higher goal.
Effectiveness: people tend to listen more to each other and act upon it by dealing with the variations directly.
Effectiveness: less likely to end up in a dispute which may be referred to arbitration or the court
Effectiveness: is also influenced by the efficiency, as 'a minimum use of resources' to implement a change may also be an objective of the change management process due to a maximum budget.

↓ = in case of distrust, * = new aspect compared to the given answers, GREY = most important relationships between trust and the change management process according to the interviewees and the author