Tender Environmental Impact Assessment Extra Discharge Capacity Afsluitdijk

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The project Extra Discharge Capacity Afsluitdijk (EDCA) of Rijkswaterstaat aims to enlarge the capacity of the discharge sluices by building new sluices, necessary because of the climate change. Rijkswaterstaat has decided to outsource the responsibility to write the Environmental Impact Report to an engineering firm. Specific problems in the outsourcing of engineering jobs involve the limited liability of the engineering firms as well as how they receive little or no feedback from the design and build phase. This paper tests the hypothesis that BVP can also be successful in the area of engineering services. The result shows that BVP can be successful in the procurement of engineering services. The application of BVP at EDCA was very distinguishing in selecting the best value vendor. It identified a vendor at a lower cost, shorter time schedule, and with more innovative ideas than the Rijkswaterstaat project team.

Introduction

Rijkswaterstaat has not only faced problems in the delivery of infrastructural projects; many projects studies have also suffered from time delays, cost overruns and low client satisfaction (see Arts, 2007). In The Netherlands, Rijkswaterstaat usually chooses an approach in which the procurement procedures for designing and building, for giving planning consent and to develop the Environmental Impact Assessment (EIA) are carried out in series (although the trend is changing to carry out the planning consent and the procurement procedure parallel early in contract involvement; see Nijsten et al, 2008). Specific problems in the outsourcing of an EIA involve the limited liability of the contractors (engineering firms) as well as how they receive little or no feedback from the design and build phase. As a rule, a different contractor carries out the design and build contract. Rijkswaterstaat has tried to counter these problems by increasing management, inspection and control. The results have not been satisfactory. Rijkswaterstaat is therefore looking for a way to minimize management, inspection and control and enlarge the accountability of engineering firms that carry out the studies for planning consent and the EIA’s.

This is one of the reasons to test the application of Best Value Procurement (BVP) in engineering services. Another main reason is the complicated process of studying the alternatives and the environmental effects in an EIA. As a consequence of the Rijkswaterstaat policy of outsourcing construction services Rijkswaterstaat does not have sufficient in-house expertise for the execution of EIA’s. Rijkswaterstaat wants to hire an expert and allow them to do their job, as well as to test the hypothesis that BVP can also be successful in the area of engineering services.

The project Extra Discharge Capacity Afsluitdijk (EDCA) is the first project at Rijkswaterstaat since the fast track projects where BVP has been applied. The scope of the project is the study of alternatives and the environmental effects for the building of new extra Discharge Sluices in the
Afsluitdijk. The market for these studies consists of large engineering firms (the same parties as in the case study Essche Stroom/Waterschap Den Dommel). This paper describes the project and contract scope, the context of the tender process, the PIPS-process for EDCA, and the process results and conclusions.

**Project Scope**

The Afsluitdijk is a major causeway in the Netherlands running from North Holland province, to Friesland province, over a length of 32 km (20 miles) and a width of 90 m, at an initial height of 7.25 m above sea level (See Figure 1). The Afsluitdijk is in between the IJsselmeer (fresh water) and the Wadden Sea. It is a fundamental part of the larger Zuiderzee Works, damming off the Zuiderzee, a salt water inlet of the North Sea and turning it into the fresh water lake of the IJsselmeer. The Afsluitdijk was built between 1927 and 1933.

Beside the dike itself there is also the necessary construction of two complexes of shipping locks and discharge sluices at both ends of the dike. The complex at Den Oever includes the Stevin lock and three series of five sluices for discharging the IJsselmeerwater into the Wadden Sea; the other complex at Kornwerderzand is composed of the Lorentz locks and two series of five sluices, making a total of 25 discharge sluices. Periodically discharging the lake is necessary since it is continually fed by rivers and streams draining their water into the IJsselmeer.

![Figure 1](image-url). The location of the Afsluitdijk

The project EDCA is a Rijkswaterstaat project. The project aims to enlarge the capacity of the discharge sluices (for discharging from the IJsselmeer to the Wadden Sea) by building new sluices, necessary because of the climate change. The water level of the IJsselmeer has for some times during winters risen to 50 cm above Normaal Amsterdams Peil (NAP) or Amsterdam Ordnance Datum, which is 90 cm above the expected or desired level. The sluices are then not able to discharge the water to the Wadden Sea during ebb tide. The climate change will lead to a higher sea level (Wadden Sea) as well as higher level of the rivers during the winters. The current differential between the IJsselmeer and the Wadden Sea is 50 cm during the ebb tide. This will be reduced to an estimated 25 cm during ebb tide in 2050 due to climate change. If no
action is taken, the discharge capacity from the IJsselmeer to the Wadden Sea would be reduced by 50%, which would lead to safety issues because of the higher water levels in the IJsselmeer. Extra dikes could be built but would be an expansive option. Extra discharge capacity is needed, to retain the current differential of 50 cm up until the year 2050 (after 2050 more investment is needed).

Additionally, the two existing complexes of shipping locks and discharge sluices are in desperate need of repair. During the repair period the complexes can’t be used, so the repair can only take place if enough discharge capacity will be available. The proposed new complex provides this needed capacity (See Figure 2). Because of the state of the existing complexes and the raising sea level the building of the new discharging sluices is urgent. In fact, the new sluices must be operating at the end of 2016. The total budget of the EDCA project is approximately €240 million for the realization and about €8 million for the overall research and decision-making process.

Figure 2. Idea of the new discharging sluices with Fish passage in the Afsluitdijk

**Contract Scope**

To realize the new discharging sluices, different decisions and permissions should be obtained. The most important of these permissions require a study to the effects of the complex on the environment. An Environmental Impact Assessment (EIA) provides this information. The assessment identifies the environmental consequences of a plan or project and should also identify environmental friendly alternatives. The assessment is reported in an EIR (Environmental Impact Report). An EIR is mandatory for the project EDCA.

The initiator, Rijkswaterstaat, is responsible for the Environmental Impact Report (EIR). The competent authority (the Minister of Infrastructure and Environment) is responsible for the decision on the project, using the EIR process. It is then published and seeks public responses.

With the cooperation of Rijkswaterstaat, the Minister of Infrastructure and Environment assesses and documents the resulting environmental impact of the project during and after construction as
determined in the EIR process. When necessary, it may take extra measures to limit the resulting impact on the environment if it exceeds the projected impact. The EIR is required for the permitting of the subject project to build the discharging sluices. The Design and Build contract for building the sluices will be tendered in 2011.

Rijkswaterstaat has decided to outsource the responsibility to write the EIR to an engineering firm. The scope of the contract includes the following: project management, stakeholder management of the decision making process, environmental technical expertise and producing all the necessary reports (of which the EIR is the most important). The purpose of the outsourcing is to minimize the decision-making of Rijkswaterstaat. Rijkswaterstaat estimates the project duration at 15 months and has a budget of €2 million.

**Context of the Tender Process**

As a government agency, Rijkswaterstaat has to follow the European legislation on public works and services. Rijkswaterstaat is a large buyer of engineering services. Instead of a (European) tender each time Rijkswaterstaat needs an engineering firm, Rijkswaterstaat uses a framework contract, similar to an IDIQ (indefinite delivery, indefinite quantity) contract in the US, where vendors are prequalified and compete on individual projects. For this framework contract, Rijkswaterstaat has held one European tender to select a certain amount of engineering firms which can be chosen to work with at individual projects. The result of this tender is a framework contract. Within the framework contract, EDCA has 11 possible firms for the tender. These 11 firms are the largest engineering firms in the Netherlands. Having the framework contract already in place minimizes the need to go through a full and open source selection, which takes an inordinate amount of time (similar to IDIQ). The project team nevertheless must comply with the European legislation and principles of transparency, objectivity and non-discrimination.

The framework contract removes the need to select parties for the tender process. The selection (or prequalification) has already taken place. To obtain the best suitable engineering firm for writing the EIR only the award criteria have to be used (see paper of Van Leeuwen and Witteveen in this Special Issue.). The best value Performance Information Procurement System (PIPS) is used as an award system within the framework contract, which states that all selected firms are allowed to participate in the award phase, and an interim selection or shortlisting based on past performance is not allowed. Therefore the past performance filter of the best value PIPS is not being implemented.

**Best Value Procurement at the EDCA**

The main reasons for using PIPS at the EDCA project is, except the complex process of studying alternatives and their environmental effects, the pressure on the time schedule (sluices operating in 2016), the amount of possible tenderers (the 11 engineering firms) and the complexity of the work (writing an E.I.R. with participation of other parties). Therefore Rijkswaterstaat is looking for a short tender process with low costs and experienced tenderers (specifically experienced on writing the EIR). BVP searches for the firm that can best minimize risks and make the most of
the chances during the tender period and the realisation of the study. This expert is expected to best realize the goals for the initiator and the project. PIPS gives this party the space and responsibility it needs to do the job the best way, with the best value.

As said the project goal(s) are very important to measure against. The main and most important project goal for EDCA is time (project finished in 2016). Within European law, contracts can be awarded either on the basis of lowest price or most economically advantageous tender (MEAT; see Van Leeuwen in this Special Issue). MEAT is based on the price of the tender and the quality of the tender. Rijkswaterstaat policy is MEAT for all tenders in the infrastructure domain. By choosing an award based on MEAT, the firms must be reasonably informed on the criteria and relative weighting, that will be applied to each criteria, to identify the most economically advantageous tender.

For the EDCA project price weights for 25% and the quality weights for 75%. Award criteria were:

| Criteria                                      | Weight |
|----------------------------------------------|--------|
| Price                                        | 25%    |
| RAVA (Risk Assessment and Value Added) plan   | 30%    |
| Schedule (planning) and scope document       | 10%    |
| Interviews with 2 key persons                | 35%    |

Rijkswaterstaat uses PIPS on a larger scale with the fast-track projects. The fast-track project and the differences between this project and the pure/original PIPS methodology (as developed by Dean Kashiwagi; see Kashiwagi, 2009) are described by Jeroen van de Rijt et al in this Special Issue. The similarities between EDCA and the fast-track projects are the absence of the use of Past Performance Information, the time schedule, the use of consensus scoring and the monetizing of value (PSI Bouw, 2007).

EDCA differs on a few items from the fast-track projects. These items are:
- Different weightings
- Overall grade for RAVA plan instead of separate grades
- The scope document
- Value added plan leaves room for variants with impact on time and/or budget
- Key personnel for the interviews were predefined

In the EDCA project, the weighting of the interviews (35%) was deliberately higher than all the other criteria and the weighting in the fast-track project (20%). The interviews are believed to provide the best prediction of whether the project can be successful in terms of reaching the project goals. The weighting of the schedule was lower than in the fast-track project (10% versus 5%), because the schedule is less dominant in distinguishing the best value vendor.

In the EDCA project each team member gives one overall grade to a RAVA plan (just like in the original methodology) instead of a grade for the Risk Assessment and Value Added plan separately. The fast-track project showed that the RA and the VA are complementary and that a mitigation measure for a risk can actually be a chance. For instance: if the risk is that the
milestones of a project cannot be met, a vendor can propose in their VA plan to change the scope so that the milestones can be met.

New in this tender is the scope document, which is called the risk assessment (RA) plan contractor in the EDCA project (Kashiwagi, 2009). The scope document and the schedule give an idea of the scope and planning of the project as seen by the tenderers. The RA plan requests the vendors to address the risks they do not control. The mitigation measures for risks that vendors do not control are part of the scope and the price. The VA plan covers items that are not in the scope and which can increase, decrease or add value to the project. The VA items are not included in the scope and therefore also not in the price.

The final difference between EDCA and the fast-track project is that in EDCA the two key staff members were chosen by the client (the project manager and the manager EIA). In the fast track project, the vendors chose three of the four staff members. The experience from the fast track project shows that vendors did not differentiate as much in the functions chosen as key staff members. So the conclusion is that the EDCA project stayed closer to the BVP process than the fast track projects.

Tender Phase

The tender process started with an overall information meeting for all 11 tenders in the framework contract. During this meeting, overall information about the project was given and the tender process was explained. One week later, a special meeting was held about the award (MEAT) and Best Value Procurement/Performance Information Procurement System. All participants could learn about BVP/PIPS and what it meant for this tender. After both meetings six firms decided to compete in the tender process. Ten days later an individual consultation meeting with each participant was held. The use of “consultation sessions” is standard procedure in The Netherlands when dealing with projects this size. It gives the firms an opportunity to find out the risks and concerns of the initiator (amongst other things). Finally four firms participated in the individual consultation meetings. Two firms withdrew from the tender process as the tender preparation was too short for them.

The firms had about three weeks after the consultation meeting to complete their tender. The quality documents were sent in and within one day the documents were rated. Five people formed the selection committee, all expert members of the team of the EDCA project team. Each team member rated the RAVA plans, the schedules and the RA engineering firm individually and independently, after which all individual scores were discussed in the team. The scores were set by consensus.

After the rating in the selection committee the interviews of the key personnel took place. The questions were made based on the quality documents. The same person asked these preset questions during each interview. Every vendor got two interviews, one with the project manager and one with the manager for the EIA. The selection committee was present with the interviews to rate the interviews. The selection committee members were the same ones who rated the quality documents and the method for rating the interviews was the same as with the quality documents.
After the rating of the interviews by the selection committee, all scores were compiled and entered into the score form. The envelopes with the prices were opened and after filling in the price on the score form, the winner of the tender was known.

**Results of the Tender**

Table 1 below shows the result of the tender. The maximum value is the maximum addition or subtraction from the fictive price. Between brackets is the score on a scale from 2 to 10, 6 being no addition or subtraction.

**Table 1**

| Results of the Tender | Maximum value (deductible from the price) | Vendor 1 | Vendor 2 | Vendor 3 | Vendor 4 |
|-----------------------|------------------------------------------|---------|---------|---------|---------|
| **Criteria**          |                                          |         |         |         |         |
| Price                 | not to be disclosed                      | 3       | 2       | 1       | 4       |
| Rank on price         |                                          |         |         |         |         |
| RAVA                  | €600,000                                 | €300,000 | -€450,000 | €450,000 | €300,000 | |
| Scopedocument         | €100,000                                 | €50,000  | -€75,000 | €75,000  | €50,000  | |
| Schedule              | €100,000                                 | €100,000 | -€50,000 | €50,000  | €0       | |
| Interviews            | €700,000                                 | €0       | -€350,000 | €0       | €175,000 | |
| Fictitious Deduction  | -€450,000                                | €925,000 | -€575,000 | -€525,000 | |
| Rank on quality       | 2                                        | 1       | 4       | 3       |
| Overall ranking       | 3                                        | 1       | 2       | 4       |

The winner of the tender was the combination of DHV and Arcadis, both large engineering firms who had bundled their experience. The best value vendor was dominantly better than the other vendors. The winner had very good scores on all aspects: RAVA, scope document, time schedule and interviews. The price the best value vendor offered was the second lowest price. Rijkswaterstaat feels they have bought the best value at a competitive price.

All vendors offered far below the budget, but there was a large spread in price ranging form €900,000 to €1,600,000. The vendors varied in classic tender behaviour and in thinking in the best interest of the client. This was especially dominant in the Value Added Plan. The best value vendor had some very good ideas about the EIA process and the participation of the stakeholders (management agreement). The best value vendor offered to reduce the 15 months given to write the EIR to about one year.

The interviews and the time schedule, however, were less distinguishing. The interviews gave quite a bit of dominant information about the content of the tenders and the insight of the tenderer in the scope of the project. All tenderers were good at this; therefore the scores for the interviews were not very distinguishing. The same was true for the schedule. While all asked...
information was in the schedule, no firm was excelled in this area. The RA engineering firm and the schedule gave insight into understanding the firms on the project scope.

Evaluation of the tender process shows that the vendors are positive about the use of BVP (Significant, 2010). The vendors appreciate the search of Rijkswaterstaat for better procurement methods and the vendors are enthusiastic about the possibility to distinguish themselves from other competitors. Vendors unanimously accept the used criteria (RAVA, scope document and interviews), although some remarks were made on the functions of the key personnel. Vendors consider training vital for the understanding of the methodology. The engineering firms question if Rijkswaterstaat can keep distance and minimize management, control and inspection during the execution of the EIA.

The result of this test shows that BVP can be successful in the procurement of engineering services. It has yet to be shown that the final results of EDCA are significantly better than other EIA’s and whether Rijkswaterstaat is capable of minimizing management, inspection and control.

Conclusion and Further Implementation at Rijkswaterstaat

The application of BVP at EDCA was very distinguishing in selecting the best value vendor. It identified a vendor at a lower cost, shorter time schedule, and with more innovative ideas than the Rijkswaterstaat project team. This reinforces the other results of the best value PIPS processes in the United States and also the previous Dutch tests. The evaluation of tender process shows that vendors appreciate the use of BVP. The preliminary result of the hypothesis that BVP is also successful in the area of engineering services is positive.

This result shows that PIPS should used more often within the framework contract and with the procurement of engineering firms (as their assignments are not always clear). Rijkswaterstaat will shortly start four more procurements for engineering services within the framework contract using BVP. Whether the contractor can minimize cost overruns and time delays will be the subject of a subsequent paper.

References

Arts (2007), (“New roads? Planning approaches for sustainable infrastructure”), Niewe Wegen? Planningsbenaderingen voor Duurzame Infrastructuur, inaugural speech Environmental and Infrastructure Planning chair, University of Groningen (only in Dutch).

Kashiwagi, D. (2009); A revolutionary approach to project management and risk minimization; best value performance information procurement system. PBSRG, Arizona State University

Leeuwen, M. van (2010); Using best value procurement in Europe, need for compromise? (in this Special Issue)
Ministry of Housing, Spatial Planning and the Environment, www.vrom.nl: Environmental Impact Assessment.

Nijsten, Arts and De Ridder (2008) Early contractor involvement, new roads to innovation! Transport Research Arena Europe 2008.

PSI Bouw (2007); Gunnen op Waarde, hoe doe je dat? Rapport in het kader van het PSIBouw-programma Gunnen op waarde (only in Dutch).

Rijt, J. van de; W. Witteveen, C. Vis & S. Santema (2010); Best Value at the Directorate-General for Public Works and Water Management in The Netherlands (in this Special Issue)

Significant (2010), Evaluation Best Value Procurement (Evaluatie Best Value Procurement; only in Dutch).