# An Opposite Design-Build Procurement Method: Competing on Quality with a Fixed Price

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## Abstract

**Purpose** – For a public project leader charged with a construction project, it can be crucial to meet the budget, while maximizing the qualities within a construction project. A method to achieve this is to use the "opposite design build" procurement method, in which the price is fixed and the contractors compete on adding a wide range of qualities to the project. However, such procurement approaches are rare, and it is difficult to find models on how to implement such an approach.

**Design/Methodology/Approach** – This study firstly looks at the literature on design-build, quality-only as the main selection criterion and to some degree on constructors' bidding behaviour. Secondly, it explains a model for a design-build, quality-only procurement designed within the public tendering legislations. Thirdly, it investigates the outcome of the model applied to a specific case in Norway.

**Findings** – There seems to be a research gap within literature and cases on design-build, quality-only selection with a fixed price. The developed model allowed for negotiations, which led to more comparable and improved bids. In the investigated case, and the client was able to implement more qualities in the project than expected within the budget.

**Research Limitations/Implications** – The researcher was himself partly involved in the process as an advisor.

**Practical Implications** – The developed method is relatively simple and might readily be applied by any client to maximise a project's qualities within a given fixed price.

**Originality/Value** – The long-term value should be to widen the range of useful procurement methods.

**Keywords** Procurement method, Fixed price, Opposite design-build, Quality, Selection, Negotiations, Case-study

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## 1. Introduction

For a public project leader charged with a construction project, it can be crucial to meet the budget, and at the same time maximize the qualities within a construction project. One method to achieve this is to use the "opposite design build" procurement method, where the price is fixed, and the competitors compete on delivering qualities. This study firstly

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examines some of the literature on design-build, quality-only as the dominant selection criterion, and to some degree the constructors' bidding behaviour. Secondly, it explains a model for a design-build, quality-only procurement. Thirdly, it investigates the outcome of the model applied as applied to a specific case.

The case project is a public nursing home project consisting of five two-storey buildings with a total built areas of 3,300 $m^2$ located in Hammerfest, a small town in the north of Norway. In this case, the author of this paper was asked for advice on what procurement method to use. Often public owners select the procurement routes they are in the habit of (Lædre *et al.*, 2006), but this particular client had an open-minded approach. The municipality had decided on a budget for the project, and this sum became common knowledge through the public budget of the municipality. The client was concerned that the contractors would perhaps quote a price on the project based on their pre-knowledge of the budget sum, and less on the actual tendering documents. There also was a concern that the bids would exceed the building costs allowed for within the project's budget. And not least there was a clear wish to maximize the qualities in the project without exceeding the costs set in the budget. It was then decided to go for a procurement method with a fixed total cost, and where the contractors should compete in terms of improving the quality of the project, in Norwegian terminology called "opposite design-built" procurement. However, as we could not find any specific model or case for this procurement method, a model had to be developed. The tender documents were published in January 2017, and the contract was signed during spring 2017, with delivery early in January 2019.

## 2. Research Method

The methods used are a literature study, a document study and interviews. A literature study was executed using Google Scholar, Worldwidescience, Oria and Citation Chaining (Ellis, 2015). Norwegian, Swedish, Danish, English and German terms were used. Examples of the English searches are: "procurement type construction", "construction procurement overview", "Design-Build fixed price". Actual cases were searched for on Google. The client allowed the author to examine the Excel data pages containing the cost information for the respective bids, and the client's assessments of these. Additionally, the project manager, the project leader and four contractors were interviewed on phone. Emails were sent back and forth to verify various details. In this paper, the author has assumed several different roles: one role has been as the co-owner of the architectural firm responsible for submitting the preliminary design. The second role was as the advisor in the matter of recommending a procurement method, creating the procurement model and working out the tendering documents. A third role is being the author of this paper and in that sense a researcher in a case where the author has worked as a key participant. After the tendering was published, the author has not participated in any further activities, such as negotiations or evaluations.

## 3. Theory and literature

### *3.1. Design-build, selection methods and pricing*

There is an extensive amount of literature describing design-build procurement, its definition, benefits and challenges. In literature dating back to 2000-2007, design-build is often referred to as not only one of the more "new procurement methods", but also "rise of an old project delivery method" (Pietroforte and Miller 2002). After some experimenting starting in the USA in 1968, the Federal Acquisition Regulations were modified to include regulations for design-build in 1997 (Beard *et al.*, 2001). Rahmani *et al.* describes design-build as an integrated method using a single contractor to act as the sole point of responsibility normally on a lump sum fixed price basis (Rahmani *et al.*, 2017). In German and Austrian literature,

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design-build is commonly referred to as new "Angloamerican" methods (Thomas, 2008). A design-build procurement with a lump sum contract could be translated into German as a "Wettbewerbsform Gesamtübertragung" with "Globalpauschalvertrag" (Gralla, 2001) or "Komplexer Global-Pauschalvertrag (Kapellmann, 2017). The design-build arrangement is attractive for clients owing to the single-point responsibility, prices reflecting the final cost, more buildable designs and an overlap of design and construction phases leading to early completion (Brook, 2017). Songer and Molenaar (1996) identify seven selection factors making owners select design-build as a delivery strategy. Among these are securing costs, decreasing the overall project costs, shortening the duration and introducing construction knowledge into design early in the process.

Less literature was found describing the selection methods for awarding a contractor in design-build procurement, but there are some (Beard *et al.*, 2001, Songer and Molenaar, 1996, Gordon, 1994). For public clients, mainly three methods are pointed out, namely, lowest price, highest quality or performance or a combination of the two. Some literature additionally describes the qualification based selection method (Wardani *et al.*, 2006). In European tendering legislation terminology, the expression "most economically advantageous tender" (MEAT) describes the selection method of combining quality and price. Authorities are permitted to determine MEAT on the basis of quality alone (Brook, 2017). Other terms for describing the quality-only selection method, are "Stipulated sum/best design" (Beard *et al.*, 2001) and "cap", which is defined as a fixed price against which contractors propose a level of quality and options for a project (Gordon, 1994). Bergman and Lundberg (2013) discuss the selection methods intensively and argue that "quality-only scoring may be the best method when funds are earmarked for a particular project". While some literature investigates methods to combine the price and quality selection method, there seems to be a research gap related to design-build procurements using quality only as the dominant award criterion.

The Norwegian Agency for Public Management and eGovernment, DIFI, describes the term "opposite design-built" (Omvendt totalentreprise) as a procurement method where the project's maximum cost is defined and the bidders compete in offering lower bids than the maximum cost set by the client. One problem with this definition is that the price ends up not being fixed, and quality aspects are not included. In Denmark, the term "opposite design-built" (omvendt-licitation) is described as a design-build tendering at a fixed price, or a target price where the contractors compete on how to meet the client's demands in the best possible way (Danske Regioner, 2015). This could mean either higher quality or more square meters being constructed. In Denmark, this seems to be a rather commonly used procurement method, and is frequently mentioned on relevant websites as in newspapers and informational material (Konkurrence og Forbrugerstyrelsen, Aktivitetsrum.dk, 2015). In this paper, the term "opposite design-build" procurement should be understood as basically in accordance with the Danish definition, but more specifically as a design-build with a fixed price and quality as the dominant award criterion.

When competing on price, opportunistic bidding behaviour is frequently observed, often resulting in cutting corners and claims (Lo *et al.*, 2007). Quality-based selection systems have a potential to encourage contractors to place more emphasis on project quality (Wardani *et al.*, 2006). The success of the quality-based selection system is strongly dependent on also evaluating the contractors' past performance and the evaluation of contractors' qualifications. When it comes to the calculation of the bid itself, Brook (2017) describes top-down estimating as meeting and improving on a client's target price for a project. Bottom-up estimating is characterised by creating a bill of quantities and work packages based on a design solution.

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*3.2 Public procurements and negotiations*

As a member of the European Economic Area (EEA), Norway's public procurement laws and regulations are obligated to be in accordance with the EU legislations. New EU Directives on public procurement, 2014/23-25/EU, resulted in new laws and regulations in Norway from 1 January 2017 (Gusvik and Werner, 2018). For projects with an estimated cost above the EU threshold, the Norwegian Public Procurement Act (Nærings- og fiskeridepartementet, 2017) only allows for negotiation if the task cannot be described clearly or if the project is of a certain complexity. In Denmark, the so called "client association" (Bygherre Foreningen) states that negotiations can be used in design-build procurements where quality is used as competition criterion (Bygherre Foreningen, 2016). Eriksen and Hane (2014) emphasise the importance of using the possibility to negotiate. The aim of the negotiations is to address misunderstandings, mistakes, reservations and possible improvements. Through the negotiation process, the client receives more comparable and improved bids (Burnett and Oder, 2015, Beard *et al.*, 2001). Any relevant part of the contract can be subject to negotiation. Such legislated limitations on allowing for negotiations result in a low number of negotiated procurements in most EU-countries. Analysis of data received from the Norwegian Agency for Public Management and eGovernment (Difi) reveals that of a total 332 public procurements with the CPV code 45 construction works in 2017, only 1 per cent were negotiated procedures. In 2016, their amount of negotiated procedures was 4 per cent. In Sweden, 8.6 per cent of the construction related contracts followed a negotiated procedure in 2013 (Lukkarinen and Jönsson, 2015). Interestingly, from April 2010 to March 2011, the corresponding statistics for France and the United Kingdom were 43.7 per cent and 34.4 per cent, respectively (Burnett and Oder, 2015). Despite the same legal framework, a client wanting negotiations in Norway seems to have to pass through the eye of a needle.

## 4. The Opposite Design-Build Procurement Model in the case study

The concept was to write a "minimum" description and a list of pre-defined additional qualities that the contractors should compete on offering within a fixed price. The client was of the opinion they had the competence for deciding the fixed price. It should not be set too high as this would result in an expensive project, although not too low as that might discourage the contractors from bidding. The fixed price was set to be NOK 70m, which is above the EU threshold of NOK 44m. According to the Procurement Regulations, open procedure or restricted procedure without negotiations should be used as a main rule. However, the client saw a great advantage in being able to negotiate. Therefore, the approach was discussed with the solicitor, a well-known expert on procurement contracts. The solicitor put forth the argument that as the competitors would be competing on quality, the regulations would allow for negotiations. The solicitor reasoned that competing on quality made the procurement sufficiently complex.

The tender consisted of preliminary building designs, a description of the wanted functions and performances, and quality requirements. The quality level of the project was set to a reasonable minimum, good enough to satisfy the project's basic functions and proposed use. A list of 19 additional diverse qualities was developed. Examples given were tiles on bathroom walls, wooden slatted ceilings in shared spaces, replacing gypsum walls with fibre–gypsum walls, wooden slatted niches at apartment entrances, plywood pattress behind gypsum walls in kitchens and living rooms, SD control system for ventilation, fulfilling the Low Energy Standard NS3700:2010, the use of Environmental Product Declarations (EPDs) and the use of BIM-collision tests during the planning phase. Additionally, the contractors could suggest other quality improvements themselves.

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The award criteria and weighting were set as follow in the tendering documents (the regulations allow for the use of intervals):

(1) Added quality – offered qualities from the quality list, 60–70 per cent
(2) Comprehension of assignment and experience level, 20–30 per cent
(3) Cost (labour rates and material costs for any potential additional work/alterations) 10 per cent

The tender documents described that the contractors had to quote a set price for every quality on the quality list, and to offer a sum, or an "economic scope of action" for the client to "shop" qualities within the fixed price. By doing so, the client did not have to decide in advance what qualities he would prioritise. Also, the client was at liberty to make these priorities after seeing the level of cost of the respective qualities. The system for ranking would be to pick the contractor with the most advantageous scope of action in relation to the wanted combination of qualities.

Section headings within the body text should be numbered sequentially. The wording of headings is at the discretion of the authors.

## 5. Results and discussion

All contractors submitted bids within the fixed sum of NOK 70m. As seen in Figure 1, Contractor Three offered no added qualities, and Contractor Four included all qualities in the bid. The pricing of the added qualities does not necessarily reflect the actual cost of the respective qualities, such as prices, are subject to competition and may thus also represent strategic pricing.

The final weighing of the award criteria was decided during the evaluation (see Table 1). The negotiations were executed by a three-person team from the client's project

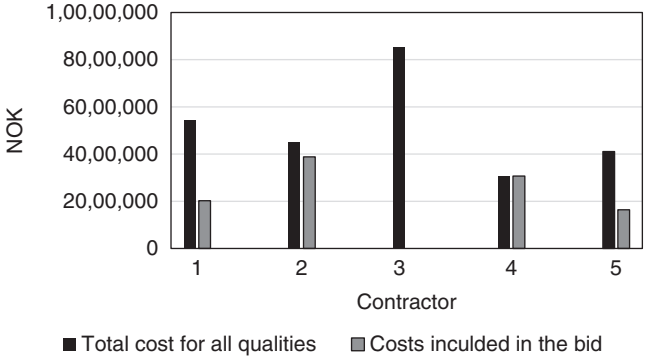


**Figure 1.** Quality Costs Before Negotiations

(Dark Columns: The Respective Total Cost for all the Qualities; White Columns: The Respective Offered 'Scope of Action' that the Client Could Spend on Added Qualities within the Fixed Price)

| Criterion/Contractor | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Quality (60%) | 59.81 | 59.9 | 53.5 | **60** | 57.8 |
| 2. Comprehension of assignment (30%) | **30** | 29,4 | 27 | 27 | 26.1 |
| 3. Cost (10%) | 9.74 | 9.22 | **10** | 9.2 | 9.19 |
| Total | **99.55** | 98.5 | 90.5 | 96.2 | 93.1 |

**Table 1.** The Competitors' Final Scores

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and procurement department. The negotiations were handled through email. Some bids were lacking in information or there had been some misunderstandings and miscalculations, and one contractor had reservations in the bid, which should not be the case and therefore had to be priced. The contractors were told indicatively whether their bids were high or low compared to the other bidders. But all bidders were also told they were in position to win. The negotiations led to more comparable bids with improved performances on quality.

Contractor One made the most significant change in their bid after the negotiation. The contractor simply more than halved the total cost of the qualities with the result that all the qualities on the quality list were implemented in the bid. Additionally, Contractor One was considered to have the best comprehension of assignment and therefore won the competition.

The client regarded the opposite design-build method as successful. Owing to the dominant weighting of the quality award criterion, combined with negotiations, the client was able to implement the total list of technical, material and performance qualities within the fixed price. As shown above, the Public Procurement Act is very restricted in allowing negotiation for contracts above the EU threshold. Therefore, a client could consider using the opposite design-build as a method for enabling negotiation. However, other legal experts may come to conclusions other than what the expert arrived at in this project. It is debatable whether the task is sufficiently complex to defend the use of negotiations in this model. What speaks for the use of negotiations as applied in this procurement are the recommendations in the literature (Erikson and Hane, 2014), and the fact that negotiations are rarely used in Norway comparable to other coutries with the same legal framework. In addition, one might also argue that the given method is transparent, as the qualities are pre-defined and measured in cost. The complexity in the evaluation lies primarily in the choosing of the specific additional qualities when the costs, and therefore the scope of action, are known. In this case, two bidders offered all qualities, but if this had not been the case, a more complex evaluation of each quality's value compared to cost would have been necessary.

One risk involved with this model, however, is to decide the level of the fixed cost. As two of five bidders in this case offered all qualities after negotiation, the fixed price could be considered a fair fixed price. But what if there would be no bids because the fixed price was set to low? The client had no concern for such a scenario. If it had been the case that no contractors would deliver any bids, then the Public Procurement Act would have allowed the client to contact some of the qualified contractors and negotiate directly with them. The client did not consider this type of scenario as necessarily disadvantageous.

All the interviewed contractors generally, as in this case, used a detailed bottom–up method to calculate the price. Eventually, they would compare this bottom-up calculation to the municipality's published project cost. Any adjustments would probably be downwards as the contractors were of the opinion that the municipalities generally had too low budgets. One of the contractors was critical towards other selection criteria than lowest price, as e.g. "comprehension of assignment" was not considered transparent. Lastly, all contractors argued that prices were kept low owing to heavy competition.

## 6. Conclusions

According to the literature search, the opposite design build-procurement method seems to be more established in Denmark than any other countries investigated. Also the literature study shows a research gap concerning the opposite design-build method. The procurement method, as outlined above, showed to be a useful tool for upgrading the quality of the project

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within the given budget, which is in accordance with Bergman and Lundberg (2013). The argument for using fixed price to help prevent contractors from quoting the municipal budgets seems weak. The method worked well within the existing bidding culture and contracting standards. The procurement method allowed the client to maximise the project qualities within the budget, while allowing the client and contractors to take advantage of the negotiations. The method does, however, require a solid knowledge of the local cost level for the specific building type.

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