

Sub-contractors and developers: A dog on a leash or?

Author

Per Langaa Jensen, Professor, Department of Management Engineering, Technical University of Denmark, Lyngby, Denmark, per.langaa@man.dtu.dk

Susse Laustsen, Architect, MAA, Ph.d, Senior Project Manager

COWI, Lyngby, Denmark, sul@cowi.dk

Ester Jensen, MSc in Tech.& Socio-eco Planning , HES consultant, MEM, COWI, Lyngby, Denmark.

Abstract

Including OHS requirements in the call for tenders has been a strategy to improve OHS performance in contracting enterprises. Following the guidance for public developers, which was passed in 2003, labour market parties in the building industry agreed to encourage public developers and their consultants to formulate OHS requirements covering the construction process. The purpose was to improve OHS on building sites. Such requirements, however, might put pressure on small sub-contractors, who may not be familiar with OHS management. This study analyses the effects of OHS requirements on small contractors.

Twenty case studies were selected: ten where OHS requirements were formulated and ten where no requirements were formulated. In all twenty cases, interviews were conducted with the developers to understand the rationale behind formulating or not formulating OHS requirements in the tender materials. In those cases where OHS requirements were formulated, 15 small contractors were

interviewed. The focus of the interviews was on barriers against utilizing such requirements and implementing the requirements. The contractors were also asked about what assistance would be helpful to them in formulating and assuring compliance with such requirements.

The data shows that small contractors value developers giving priority to OHS and ensuring compliance. Both developers and contractors support a pro-active approach to OHS as such an approach results in a better and safer construction site.

In the follow-up analysis, the developers were first divided into three types according to their approach to OHS management: the interested and engaged developer, the compliance developer and the 'others know better' developer. This classification forms the basis of a theoretical discussion drawing attention to the relationship between the developer and the contractor, the types of reaction among contractors and the organizational understanding needed by developers in order to achieve results.

The results of the study include a set of tools that can be applied to include OHS in tenders and contracts. Finally, the theoretical analysis provides a conceptual frame for strategizing within this field.

Key words

Building industry, OHS requirements, tender

Introduction

Generally, the construction industry is a high risk industry, this has been documented both on a national and international level. In Denmark, more than 5000 work-related accidents are reported annually in the construction industry, equalling 27 accidents per 1000 people employed in the construction industry (*Arbejdstilsynet, 2007; Jørgensen, 2008*). Of these accidents, 700 are serious accidents and on average 10 are fatal accidents. Agriculture and the construction industry are the two industries in Denmark that experience the highest number of fatal accidents. Available data show equivalent results for Europe, Australia and the United States (*Mayhew and Quinlan, 1997; Mayhew, 2002; James et al., 2007*). Disease in the construction industry shows similarly high figures, the major contributors being injuries to the musculoskeletal system, hearing damage and damage from working with substances and materials.

The root-causes are well known. The construction industry is a project-based industry that acts in a dynamic and changing environment (*Lindgard & Rowlinson, 2005*). Construction is often characterized as "meaningful chaos" (*Kristensen & Nielsen, 2001*), resulting in a building or plant being built. Construction involves many actors who may be combined in many ways according to the individual building project. Projects are often one-of-a-kind products, on-site production under the influence of the weather, and changing co-operation from project to project (*Kristensen & Nielsen, 2001*). Another characteristic is the traditional separation of design and execution functions in construction. All these different factors contribute to the special nature of building projects. Especially during the execution of the building project, problems occur on a day-to-day basis, requiring quick, decentralized solutions by means of ongoing planning and adaptation of an organic organization. This creates a free, independent culture with construction workers and building managers, who traditionally have a more free relation with the authorities and to legislation (*Lindgard & Rowlinson, 2005*).

In Denmark, the construction industry consists of 30,000 enterprises, employing between 180,000-200,000 people. The industry consists of a few large enterprises and a number of SMEs, of which 84.5 % have less than 10 employees, 14 % have between 10-50 employees, 1 % between 50 and 100 employees, and only 0.5 % have more than 100 employees (*Danmarks Statistik, 2009*). One of the reasons for this dispersion is the nature and need for flexibility of the construction industry. Part of the reason, at least in Denmark, is a structural problem caused by the economic factors in the competitive contract award procedure, entailing most work in the construction industry being put out to tender. The structure and the way contracts with contractors are organized fundamentally impact the need for flexibility in the construction industry, but this structure is also pointed out as the reason for many work site safety problems, because these are related to sub-contractors' performance and casual ad hoc connection to the specific building project. The presence of sub-contractors is often pointed out as a significant factor of the poor safety results in the construction industry (*Lindgard & Rowlinson, 2005*).

The way an invitation to tender focuses on price rather than, for instance, safety activities contributes to contractors not counting in expenses of safety activities (*Brooks, 1993*). Even though the requirements in the contracts are set to take pricing of safety and health into consideration, it is rarely part of the preliminary work in the construction industry (*Oluwoye & MacLennan, 1994*).

Most construction projects are put out to tender in competition and the lowest tender is usually accepted. Sub-contracting is typically a payment-by-results system where payment is based on a certain amount of work completed, rather than the time spent on the project. Consequently, if the tasks are to be completed in the shortest possible time, this leads to sub-contractors pushing

themselves hard, working excessive hours or cutting corners in regard to safety (*Mayhew, Quinlan and Ferris, 1997*). As a consequence, this competitive contract award procedure puts pressure on small enterprises, forcing them to submit low prices in order to win the competition, and at the same time this pressure often leads to for the parts of a tender covering safety work and equipment being omitted (*Brook, 1993; Lindgard & Rowlinson, 2005*). Evidence suggests that industries in which sub-contracting and self-employment are common have an especially high frequency of serious injuries and fatalities (*Mayhew, Quinlan and Ferris, 1997*).

Contractors' special OHS problems are stressed:

1. Many of the projects put out to tender go to smaller organisations, which usually have less sophisticated management systems.
2. Problems can arise with regard to the coordination of safety management in situations where contractors and temporary staff work in physical proximity to in-house personnel.
3. This inter-organisational contracting can have a detrimental impact on collective communication.
4. Associated commercial contracts can potentially limit the ability of organizations to invest in safety and health measures because the jobs are put out to tender.

It is important to note that small businesses may have limited resources to invest in OHS measures, including limited management time and resources to train and follow up staff and also limited resources to purchase new equipment to be used on site. At the same time, the small enterprises possess limited expertise and logistic resources. This tends to counter the awareness of safety and health problems and knowledge of legislation and preventive measures is limited. Also, awareness

of the costs of serious accidents is quite limited and at the same time, there is a tendency to blame the individual employee when something goes wrong (*Mayhew, 2002*).

Similar, strong evidence shows that the coordination of safety at work sites housing several sub-contracts, can become problematic, due to diffusion of over-all management control and responsibilities (*James, Johnstone, Quiland & Walters, 2007*).

Studies also show that tenderers are generally unaware of whether risk assessments have been carried out by sub-contractors and that the exchange of OHS information between agencies and host employers is very limited (*Wiseman & Gilbert, 2000*). There is also evidence that the market relationship between the different organizations involved in supply chains can lead to situations where the major and financially stronger parties secure financial contractual terms that can detrimentally affect the management of OHS in those organizations with whom they contract (*James, Johnstone, Quiland & Walters, 2007*). In a study of OHS in small enterprises, a number of the owners reported how their ability to invest in OHS was limited by narrow profit margins that they were operating under as a result of the contract prices demanded by larger developers (*Vickers, Baldock, Smallbone, James, 2003*). The result is that whereas most major construction enterprises have produced specific safety manuals, information and programmes for sub-contractors, this has little or no discernible effect on the safety and health awareness and attitudes of sub-contractors (*Mayhew, Quinlan, Ferris, 1997*).

A survey in Australia on sub-contractors' influences on the OHS system found that the patterns of injuries reflected the specific hazards and risk exposures found within each of the groups studied. However, these hazards and risks were exacerbated for many sub-contractors in line with the

intensification of their labour following economic pressure and survival prerogatives (*Mayhew, Quinlan, Ferris, 1997*). The investigation results are as follows:

1. The motor of economic rationalism which is the necessity of under-cutting prices to win tenders and the increasing need for a more flexible labour force has resulted in more and more jobs being outsourced. Most importantly, both financial and safety and health risks can be outsourced. At no point in the study did the investigator encounter evidence that safety and health was perceived as a good economic investment.
2. The increasing fragmentation of workplace management which results from contracting also poses major safety and health risks. In the building industry, for example, verbal abuse between contractors can be seen as a direct consequence of crowding, disorganization and poor scheduling of work.
3. The inadequate regulatory controls, where it is difficult for the authorities to visit the many different small enterprises and the many construction sites within the relatively short lifetime of the project, i.e. the period for the construction.

A debate about why the construction industry operates with a profound fragmentation into subsuppliers and sub-contractors leads to two primary arguments (*Winch, 2008*):

- Some argue that this is the result of a decision on a cost issue, which is sought minimized through maximisation of flexibility in order to cope with the uncertainties in the resources required for a particular project.
- Others argue that it is a result of a production cost problem, driven by specialization to achieve production efficiency through economies of scale and learning curve.

The consequences are high-risk OHS which is difficult to manage, control and coordinate at sites.

To regulate this situation, a legislative initiative was introduced by the “Council Directive 92/57/EEC of 24 June 1992 on the implementation of minimum OHS requirements at temporary or mobile construction sites "in order to emphasize the role of the developer, and hold him or her liable for the formulation of a plan for safety and health at the building site". Inspired by experiences from major, trendsetting construction projects in Denmark (the bridge between Sweden and Denmark, the Copenhagen Metro and construction of new premises of the Danish Broadcasting Corporation), the Danish Association of Construction Developers (DACC), The Danish Association of Consulting Engineers (FRI), the Danish Association of Architectural Firms (DANSKE ARK) and the Branch OHS Council for Construction agreed upon a shared declaration of values in relation to OHS for partners involved in management of construction.

With a shared set of values, the parties along with the authorities wish to take on joint responsibility for making building and civil engineering work sites some of the safest in Denmark. Thereby, the parties agree that individually and together, based on the OHS Act, they will encourage their members to fulfil the recommendations listed in the set of values.

Research Question

The purpose of this study is to examine how this strategy works in practice in order to contribute to the developer's OHS requirements having the most impact on small construction enterprises. In other words, the study examines:

1. What factors motivate and limit, respectively, the developer and his consultant in setting OHS requirements?

2. How do small enterprises in the civil engineering industry perceive OHS requirements formulated by developers?
3. How do OHS requirements affect small enterprises in the civil engineering industry when they are to bid on a tender and carry out the assignment?
4. Do small enterprises experience specific obstacles that make it harder for them to fill motivated to fulfil the requirements for obtaining a better working environment?
5. Is it possible to minimize these barriers, for instance through changed wording of OHS requirements and documentation requirements?

Methods

This study is based on 20 cases, of which 10 focused on developers listing OHS requirements in the tender documents, and 10 involved developers that do not include OHS requirements. The composition of developers involved in the study is shown in Table 1.

Developer characteristics	Developer type	Number
Developers that set OHS requirements	Private production enterprise	2
	Government institution	4
	Municipality	2
	Private developer, partially government owned	1
	Development enterprise, owned by state and municipality	1
	Developer - private chain store	3
	Developer	2

Developers that do not set OHS requirements	Non-profit housing association	1
	Municipality/municipal utility enterprise	2
	Property enterprise in independent institution	1
	Private property enterprise	1

Table 1 Overview of interviewed developers that do and do not set OHS requirements

The case studies included visits to the developers, interviewing key persons responsible for both formulating tender documents, specifying OHS requirements and for checking that the contractor hands over the required documentation and that the requirements are met on the building site. In addition, 1-2 small construction enterprises in each case (a total of 15) were interviewed about their OHS documentation during the bidding phase and during execution of the building project, as well as their OHS work and their assessment of the resulting site OHS etc.

Interviews were qualitative, guided by an interview guide structured by the themes relating to the basic purpose of the study. No studies were made of the OHS of the specific building sites, so the statements on OHS work and OHS conditions at the site are based solely on the statements of the interviewees.

When selecting small construction enterprises for interviews, the intention was to choose primarily enterprises with fewer than 10 employees. This turned out not to be possible as major developer organizations often set OHS requirements, and they rarely contract with small contractors. Five of the contractors interviewed have 10 or fewer employees, whereas two thirds of the contractors interviewed have 20 or fewer employees. Similarly, the intention was to select contractors with a

direct contract with the developer rather than contractors that are sub-contractors under a lead or turnkey contractor, who has a contract with the developer. In three cases, we have had to interview the sub-contractor. Size and composition of contractors is shown in Table 2.

Contractor type - discipline	Number of employees	Construction contractor ¹⁾	Sub-contractor ²⁾
Mason	From 2.5-10	2,5	x
Painter contractor		5	X
Carpenter		7	x
Carpenter and construction management contractor		9	x
Self-employed carpenter		10	x
Demolition contractor	From 11-20	15	X
Sun protection and glass coverage contractor		15-20	X
Soil and civil engineering contractor		15-20	x
Self-employed carpenter		20	x
Scaffolding contractor		20	x
Electrician	From 21-30	24	x
Equipment and building contractor		25	x
Civil engineering contractor		25-30	x
Asbestos contractor	From 31-50	43	x

1) Construction contractors work under direct independent contract with the developer.

2) Sub-contractors work under a lead contractor who has a contract with the developer.

Table 2 Overview of interviewed contractors and number of employees

Results

Based on the cases and how developers act when handling OHS requirements during the bidding and execution phases, we see different characteristics, which makes it possible to group the developers interviewed into the following the typical developer types or ideal models on which we will base our theory founded analysis:

- IED: The Interested and Engaged Developer, that is, developers who focus on OHS, who know how to formulate requirements, and who are committed in this field.
- CD: The Compliance Developer who prioritizes that rules are respected.
- OKB: Developers who believe that **O**thers **K**now **B**est regarding OHS, for which reason others and not the developer should handle safety and health interests.

Ideal type 1: the interested and engaged developer (IED)

IED greatly focuses on safety on building sites and set safety requirements beyond what is stipulated in the law. Experience with safety, accidents and incidents play an important role for IED and experience is passed on in the safety work. The following quotation illustrates the general attitude towards safety:

"Without any awareness of safety on the part of the individual worker and his manager, bad work habits and OHS conditions will develop, potentially leading to personal injuries and reducing quality and productivity".

Requirements are set regarding written documentation on OHS already during bidding, e.g., on OHS policies, safety organization, accident and incident management, training of employees and statement of critical works. Alternatively, some IEDs choose to approve in advance the construction enterprise before permission to work for the developer is granted. The pre-approval may, e.g.,

follow a set frame, where the contractor is to describe how he handles 11 different OHSal issues (GES system).

IEDs have the following opinions on written documentation during the tendering phase:

- It is difficult for small enterprises to provide documentation.
- The contractor's OHS on site does not depend on the size of the contractor, rather the enterprise culture matters.
- When the developer helps the small enterprises, they can contribute with information.

It is IEDs' experience that if the developer helps the small enterprises, it is also possible to obtain the requested documentation. For instance, an IED has set up a GES light where the developer through visits at the developer and meetings assists in finding or preparing the relevant documentation. Furthermore, IED points out that it is important to simplify the required documentation, e.g., by using check forms etc.

IEDs have specific OHS requirements to the contractor's work during execution, and there is a fixed routine for incorporating the requirements in the tender documents. IEDs impose the same OHS requirements, regardless of the contractor being large or small.

It is the experience of IEDs that OHS requirements affect the OHS work of the contractor and the OHS conditions at the site. One IED says:

" Employees of the contractor that work with us have a much lower frequency of accidents than employees at the contractors working at other sites".

Written documentation is required, such as preparation of work procedures and work permits, documentation of model rounds, reporting of accident, near-accidents and incidents, course diplomas etc.

At an IED work site, the developer sees to it that his own OHS organization ensures that the determined OHS requirements are fulfilled, e.g., through his own safety or building manager. The developer's organization arranges or participates in safety rounds and is in direct dialogue with the contractor. The developer organization is in charge of the safety meetings, and introduction courses are often arranged for new employees at the site. At some developers, meetings are arranged in order to exchange experiences on OHS with all the different small enterprises at the site.

" We use good examples towards the contractors and gather experience that are passed on at meeting with all the small contractors and workmen."

Contractors' opinions

The small contractors working at IED generally believe that it is okay for the developer to require written documentation as long as there is not too much paperwork. The small contractors agree that it is easier for the large contractors to provide written documentation as they have administrative staff to do the job. The small enterprise has a master, who has to use weekends to prepare the paperwork.

The small contractors agree that the requirements made by the developer affect both the OHS work of the contractor - papers are organized, workplace assessments etc. - and the OHS conditions at the

developer's sites. Several of them believe that it has generally improved OHS conditions at the contractor, even when working for developers that do not set OHS requirements.

Ideal type 2: rules are respected (Compliance Developer, CD)

To CDs, the most important OHS requirement is that the health and safety at work act is abided by. In the cases reviewed, it is also stated that CDs in their safety work on site are very focused on the safety for customers, tenants or third parties being kept at a high level.

CDs do not set requirements to written documentation of the contractor's OHS performance in the tender documents. The contractor's OHS performance is not a direct indicator that is rated during selection of contractor. However, an indirect assessment is made of the contractors working for the developer. Most CDs say that if a contractor on a project for the developer does not meet the required OHS conditions, he will not be allowed to make a bid the next time.

"In reality, there is no way of checking out the tenderers in advance, but we believe that it is possible to fix it if something goes wrong during the execution phase."

The successive consultants of the CDs choose what specific OHS requirements are set in the specific tender, and often it is the responsibility of the architect/consultant that follow-up is carried out. There are no or few requirements to documentation of OHS condition during execution - for instance, proof of OHS training or reports on accidents may be required at the safety meeting.

A CD follows up on whether OHS conditions are acceptable by means of supervision and leave it to the contractor or a consultant to ensure safety coordination. The developer stays in contact with the

contractor at building meetings where safety issues are addressed. No conscious feedback on experiences with good OHS examples is made.

"It is part of the supervisors' job description to interfere with OHS conditions if necessary."

Contractors' opinions

The small contractors working with CD generally believe that it is okay for the developer to set OHS requirements, but these requirements must also apply to the developer and his consultants. Too often does the consultant or developer ask for solutions that entail a poor OHS for those carrying out construction work.

It is a widespread wish that OHS requirements be described in-depth in the tender documents, so that the contractor knows what he is bidding on. Agreement lacks on whether CDs' OHS requirements influence the OHS work or OHS conditions at the site. Some contractors believe they influence the OHS at the specific site, but nowhere else, whereas others do not believe that they influence the OHS - "the health and safety at work act must also be abided by."

Ideal type 3: others know best (OKB)

OKBs do not set requirements to OHS in their tender materials or contracts and thus do not rate their contractors directly on OHS performance. Many OKBs have a permanent range of contractors that are invited to bid, and should any problems arise with a contractor, he will not be allowed to bid the next time - for instance, problems with following the health and safety at work act.

Thereby, OKBs do not set requirements that the contractor is to provide written OHS documentation, e.g., safety records or work procedures.

In general, OKBs believe that the OHS conditions at the developer's sites are good and expect the contractor to seriously work on OHS. OKBs believe that large contractors are better at abiding by the health and safety at work act than the small.

All interviewed OKBs are familiar with their developer responsibilities regarding OHS - however, not all agree that it is fair. OKBs believe that the contractor at the site know the OHS conditions and leave it to him or his consultant to handle safety issues on behalf of the developer.

OKBs are represented on site through their consultants and contractors and learn about safety at building meetings. Some OKBs believe that it is the obligation of the National OHS Authority to check if the health and safety at work act is respected on sites.

Distribution of the three ideal models

Table 3 shows how the 20 cases are distributed between the three ideal models.

Developer characteristics	Developer type	Number
IED	Private production enterprise	2
	One time developer - government institution	1
	Private developer partially government owned	1
	Government institution	3

CD	Municipality	2
	Development enterprise, owned by state and municipality	1
OKB	Developer - private store chain	3
	Developer	2
	Non-profit housing association	1
	Municipality	1
	Property enterprise in independent institution	1
	Private property enterprise	1

Table 3 Distribution of developers between the three ideal models.

IEDs are typically either developers with a production in which high requirements are made regarding supervision of the production process, e.g., featuring high requirements to safety and quality. Or IEDs are developers who, due to image considerations, wish to profile themselves as encouraging OHS and a high safety level.

CDs are public developers, both government and municipal - often with several experiences of acting as developer. It is a political wish that state developers set OHS requirements. The developer guideline for government developers outlines how the government developer should handle his role regarding OHS, e.g., by ensuring that OHS conditions are clearly stated in the contract basis.

OKBs comprise both private and public developers as well as investment enterprises and developers. Typically, OKBs are aware that poor OHS can damage their image, and many stress

that OHS is important to their enterprises, and that the worst thing would be to be on the front page due to poor OHS.

Developer type	IED	CD	OKB
OHS requirements			
Bidding phase: Requirements to written documentation of the contractor's OHS performance:			
• Pre-approval of contractor	X	(X)	
• Written documentation is to be included in bid, such as OHS policy, safety record, OHS certification, training, workplace assessments etc.	X		
• OHS is a criterion for selection of contractor - this counts for a certain percentage in the selection	X		
• No requirements to written documentation during bidding phase		X	X
Scope and level of detail of the developer's OHS requirements in the tender documents			
• Written formulation of special OHS requirements that go beyond the requirements of the health and safety at work act.	X		
• Written formulation of requirement that the health and safety at work act must be observed - some requirements are specified in plan for safety and health.	X	X	
• Written formulation of requirement that the health and safety at work act must be observed.		X	
• No written requirements to observance of the health and safety at work act			X
Execution phase: Requirement to written documentation			
• Written documentation in the form of safety records, incidents, safety data sheets, model rounds, completed safety training, substitution considerations etc.	X		(X)
• Written formulation of some OHS issues, e.g., workplace assessments, accidents etc., before work is commenced.	X	(X)	
• Oral documentation of incidents, accidents, safety planning at building and safety meetings.		X	(X)
No requirements to documentation - is to be handled through the contractor's self-policing.			X

Table 4 The three ideal models for developer management of documentation and OHS requirements

Table 4 illustrates how, respectively, IEDs, CDs and OKBs deal with documentation, both during the bidding phase and during execution of the building project. The table also shows the scope of the developer's OHS requirements and level of detail.

Above, we have chosen to characterize our 20 cases by means of three ideal models, but if we dig deeper, we can see a trend that a few of the characterized CDs are moving up, being similar to IEDs. In one case, we saw a very extensive requirement to written documentation and requirements to follow-up during the execution phase. In another case, we saw how the developer's appointed safety manager on a daily basis communicates and helps the small contractors make their OHS routines work. In Table 4, this is indicated by an (X) and purple colour (a mix of red and blue). Where we see the most movement is in the OKB group. In this group, half of the developers interviewed state that they generally intend to set OHS requirements in their future tenders and contracts.

In one case, the developer chose to check and follow up on OHS on his sites, and hired a consultant to carry out OHS inspections according to the principle of model work site every two weeks. The consultant is authorised to shut down sections of the building site until conditions are acceptable. In case of repeated, unacceptable conditions, meetings will be held at the top level to improve conditions. This is shown in Table 4 with an (X) and orange colour (a mix of red and yellow).

However, some OKBs say that they will never set OHS requirements - that it is the responsibility of the consultants and the contractor to observe the law, and both the National OHS Authority and the trade associations set OHS requirements.

Does OHS impact price, quality and the number of tenderers?

In our case study, we have asked developers that do not set OHS requirements as well as contractors about their attitude towards whether OHS affects quality. We have also asked all developers and contractors about the influence of OHS on price and on who bids. Not everyone answered the question.

Table 5 provides a summary of the answers received, distributed between the three ideal models and contractors.

Contract elements affected by OHS requirements		IED developer	CD developer	OKN	Contractor
Yes	Requirements increase the price	3	1	2	10
	Requirements decrease the price	1	1	1	
	Improvement of quality			8	5
	The number of tenderers is decreased	1			9
No	Do not affect the price		3	6	3
	No improvement of quality			1	2
	The number of tenderers is not changed	3	6		5
Do not know	Whether price is affected		1		1
	Whether quality is affected				
	Whether the number of tenderers is affected				

Table 5 The influence of OHS on quality, price and the number of tenderers.

The influence of OHS on quality

Out of nine developers that do not set OHS requirements, eight believe that OHS improve the quality at the building site and of the end product. Once cleaning and tidying up is organized and access routes are well-defined, materials are also managed, and the possibility of carrying out the job with excellent quality is increased, just as waste is minimized.

Contractors agree with developers that excellent OHS improve quality. Out of seven contractors that answered the question, five believe that quality is improved.

The influence of OHS on price

Small contractors have no doubts when asked whether OHS requirements influence price. Ten out of fourteen that answered the questions believe that OHS influences price, and that it is increased. More administration and more paperwork are requirement to fulfil the OHS requirements set, and increased investments in more OHS friendly equipment are required.

However, developers disagree whether OHS requirements increase or lower the price. In case of the engaged developer (IED), three out of four believe that the price of the building project increases. The argument is that requirements to increased safety means that work takes more time, and that more time must be spent on planning. Whether the overall economy of the project increases, we have not looked into, but this could be an interesting topic for new projects to delve into.

In case of CDs, half of the interviewees believe that OHS requirements do not influence the price of the building project - the health and safety at work act must always be observed regardless -

whereas one developer believes that the price increases, and one believes that the building project becomes cheaper.

In the case of developers that do not set OHS requirements (OKB), half believe that OHS requirements do not influence price, whereas two expect an increased price, and one expects the project as a whole to become cheaper.

OHS requirements on small enterprises' willingness to bid

Nine out of fourteen contractors reply that they believe that fewer small enterprises will bid on jobs, when OHS requirements are set - in particular given the boom at the time of the interview. As mentioned, one of the reasons is that it is more troublesome and demanding to work at a developer that focuses on excellent OHS and wants written documentation.

Regardless of their type, the majority of developers do not believe that requirements to OHS in tender documents stop small contractors from bidding.

Discussion

Our study is based on a limited number of cases (20). One of our ambitions is to make a number of recommendations for how to establish processes between developers and small contractors with a view to developing excellent OHS at work sites. In order to do this based on the relatively small number of cases, a theory based analyses of these cases can provide an in-depth understanding. In the following, we will:

- Examine the motives for including OHS in the contract between developers and contractors,

- then, analyse how the relation between developers and contractors must develop in order to support the ambitions, and
- finally, analyse the requirements to competences that are set to the OHS manager of the developers, if the relation between developers and contractors is to develop positively from an OHS perspective.

Motives for OHS elements in contracts

Analyzing the cases, we are able to - as mentioned in previous sections - set up three ideal models for how developers deal with working with OHS as an element of the contracts between developers and contractors. The three types are:

- IED: The Interested and Engaged Developer, that is, developers who focus on OHS, who know how to formulate requirements, and who are committed in this field.
- CD: The Compliance Developer who prioritizes that rules are respected.
- OKB: Developers who believe that **O**thers **K**now **B**est regarding OHS, for which reason others and not the developer should handle safety and health interests.

The latter developer does not include OHS in contracts, expecting other actors - first and foremost the National Working Environment Authority to handle this. Several of the developers interviewed expect enterprises to also work seriously on OHS. But this element is not put down in formal, written agreements.

Among the first two types of developers, it is implicitly expected that the interest in OHS spreads like ripples in a pond. This entails the expectation that requirements to OHS spread through the

supplier chain. Case enterprises are small contractors, and it may therefore be expected that they are at the bottom of the production chain. However, it was not our impression that requirements to OHS are spread in the supply chain. Typically, a specific requirement is "only" attached to the immediate relation between developer and contractor.

In the group of developers entering into agreements on OHS, several motives exist for including such requirements in an agreement. First of all, the aim of maintaining legitimacy in society is stressed. The objective is to appear as a decent or great developer who generally behaves properly, also in relation to own or contractors' employees. This is not only done to avoid negative media attention, but also to appear to be an enterprise that is a great place to work. Secondly, quality is stressed. They want to be known for doing a great job. In this connection, the developers state that a sound work place in terms of OHS is a key element in ensuring good quality work. Lastly, the enterprises are aware of the economy of making such requirements. Several - but not all - state that requirements at first glance entail increased costs. But at the same time, they find that many work place processes run a better and easier course. Consequently, it is their assessment that a total economic assessment would show that the costs of the building project are not increased significantly. At the same time, they point out that their accounting systems are built in a way to only register costs and not economic benefits throughout the entire construction period. As such, the effort is based on attitudes, rather than calculations.

In the group of contractors, two advantages of entering into this kind of contracts are highlighted. First, the contracts in question are often great, long-term contracts, and second, they entail an improvement of or small boost in how the small contractor plans and manages work.

How does the relation from market to network function?

The theoretical starting point for incorporation OHS aspects in contracts is a principal - agent understanding (Nygaard, 2006). The principal wants a job to be done, but is not able to do so himself, either due to resources (time and economy) or due to lack of competences. Therefore he contacts an agent who is able to and willing to do the job for him or her. In this context, the interest of the principal is to ensure that the agent acts in the interests of the principal, rather than solely pursuing his own interests. The solution regarding the issue of interest is sought through a contract that determines the relationship between the agent's services and the resulting reward. The services may be determined in terms of the result (a result contract), or in terms of how the service is produced (a behaviour contract). At the same time, there is an asymmetry in information between agent and principal. The principal does not possess exhaustive information on the agent's activities and is unable to obtain such information by a reasonable amount of effort. Regardless of the contract type, the principal will therefore have to check if the contract is performed.

Most often, OHS requirements are incorporated as behavioural requirements. A safety organization must be established with the purpose of preparing OHS plans, carrying out inspections etc. Within the group of developers including OHS aspects in contracts, the check function is neglected by many. This is the group designated CD. It is determined what requirements must be fulfilled, but no follow-up is done to ensure that it is carried out in practice. Thereby, the requirements quickly lose value compared to the concrete OHS effect.

Second, there is no competence symmetry between developers and small contractors. Often, contractors do not know how to actually fulfil the requirements. Therefore, some developers compensate by hiring another, supplementary agent (an enterprise) to check the first agent (the

contractor). In this way, the developer tries to control both agents by means of contracts (typically behaviour contracts). But the relation between the two agents is not clearly specified. This entails special requirements for the check agent regarding great pedagogical insight and ability to balance between dialogue and guidance and check and reports to the principal when problems are identified.

In the group of developers termed IEC, it turns out, though, that the principal - agent model does not capture the essence of the relation between developers and the contractor. In order to shed light on this, basic models for organization of activities in society may be drawn up. On a very general level, three types of organization exist: market, hierarchy and - the newest - network. The below figures provides a brief characterization of these three types:

	Organization type		
	Market	Hierarchy	Network
Basis for relation	Contract	Employment	Supplementary strengths
Key communication element	Price	Routines	Relations
How to treat disagreement	Legislation	Order	Reputation
Flexibility of relation	High	Low	Medium
Degree of mutual obligation	Low	High	Medium
Tone between actors	Precision	Formal, Top-down	Open and mutual
Characterization of link between actors	Independent	Dependent	Mutual

Figure 1 Different types of organization

The principal - agent model is an exercise of the market based organization type. But with IEC developers, the organization type quickly evolves into a network. The developer helps the contractors fulfil OHS requirements. In this way, collaboration is established, requiring that the

developer has staff with special OHS competences. These staff members are part of a collaboration with contractors. From the developer's point of view, this collaboration can be characterized as pedagogical work: you teach the contractors how to behave. This also means that long-term relations are established between the developer and the contractors. They are to learn how to behave correctly, and both parties benefit from maintaining the relation once the right behaviour has been learned.

How to determine the right behaviour: isomorphism

But how do you determine what the right behaviour is? Institutional organization theory may assist us (*DiMaggio & Powell, 1983*) with a concept. As mentioned earlier, an enterprise is not only to be efficient in terms of economy, it must also ensure legitimacy. There is an abundance of social institutions that collect and set up norms for right behaviour and thereby what is legitimate. The National Working Environment Authority is a significant norm sender. Through acts and orders, guidelines etc., this authority sets up requirements and expectations for the activities of enterprises. According to DiMaggio & Powell, enterprises may react in three different ways:

1. They can imitate out of necessity (isomorphism). This means that they meet the specific requirements facing them without necessarily embracing the intentions behind the requirements. The primary objective is to avoid sanctions. An OHS plan is made. It is not followed consistently, but it is there. The workplace assessment forms prepared by the National Working Environment Authority are filled in to ensure that the paperwork is taken care of.
2. They can imitate the perceived trendsetters, the good or the correct (memotechnical isomorphism). You are inspired by an enterprise that you see as good and do the same as them, without considering whether everything can be copied to your context, but in the hope

of being perceived as good. For instance, the developer asks his consultant to set a number of relevant requirements in the tender documents, signalling a high level of OHS. The consultant signals great OHS ambitions on behalf of the developer without assessing whether the developer has the resources or knowledge required to realise or follow up on them in practice. Initiatives are introduced that are often not followed in practice.

3. They can actively relate to the requirements, embrace them and internalize them in their own routines (normative isomorphism). This is typically done by hiring a trained person with in-depth knowledge of the field. In connection with OHS, this could be a safety manager who has in-depth knowledge of the requirements, the underlying intentions and different ways of fulfilling them.

Enterprises in the IEC group are typically found to have the third reaction pattern, whereas DC companies often display the first reaction pattern. So, for OHS requirements in agreements to have any real effect, it is necessary for the enterprises to have the competences necessary to internalize the requirements and expectations facing the enterprise.

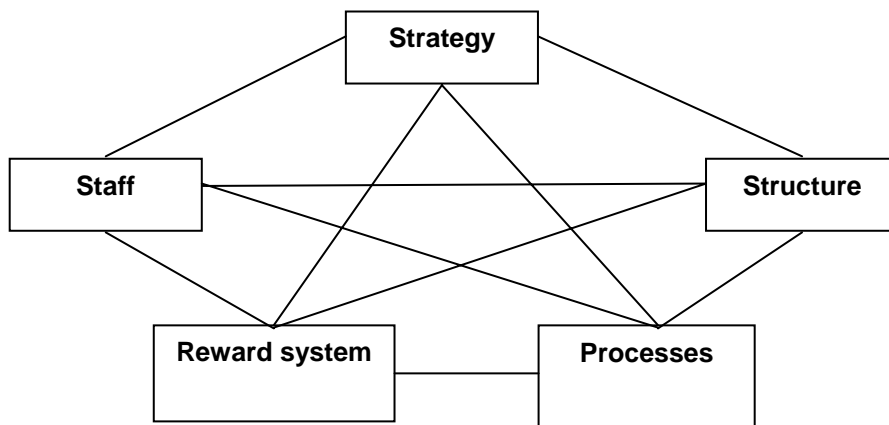
Necessary understanding at developer: organizational design

The analysis shows, however, that it is not enough to merely have the competences to convert the requirements and expectations of authorities. It is also necessary that the person(s) in charge of the OHS aspect in the developer's organization sees the specific efforts in the overall, organizational context and act accordingly. A few examples from the study serve as illustration.

An effort to integrate OHS will struggle to succeed, if the salary system only rewards quick execution of jobs. It will also be hard for it to succeed if all procedures are neglected in situations

where time schedules are not respected and budgets are struggling. Also, it will be hard to realize such effort if the work of the different groups is not coordinated.

In his star model for organizational design, Galbraith (2002) mentions certain relations to be aware of.



The model illustrates key connections in a well-functioning organization. The enterprise strategy determines goals, vision and mission. The structure determines the allocation of responsibilities and thereby formal power positions. Processes refer to the information and decision processes present in the enterprise, and that often travel across departments etc. The reward system is the set of rewards and sanctions seeking to ensure some extent of agreement between personal and organizational goals. And lastly, staff comprises the different activities directed at the staff such as procedures regarding recruitment and competence development.

By the figure, Galbraith seeks to stress that it is important for a function to function effectively that the decisions made in each of the five areas support each other. In other words, it must be ensured that the structure, the relations across departments etc., reward systems and the practice around recruitment and development of staff match. Thus, it is crucial that the OHS strategy does not lead a

separate life apart from the other strategies in the enterprise. If the strategy contains the ambition to establish and operate safe work sites and to ensure great OHS conditions for the staff - including at sub-contractors - it is necessary to consider the different contexts. This entails analysing questions such as: Are the people working on realizing this part of the strategy located correctly in the structure? Are they involved in key information and decision flows? Does the reward system support the desired behaviour - also in critical situations? It is ensured that the right competences are present regarding OHS work?

Through the study, it became clear that the person responsible for the OHS field getting the right place in the enterprise and in the relation to its sub-contractors is able to carry out such analyses, and then work to remedy any deficiencies. This competence is often overlooked for this group (*Jensen, 2002*).

Conclusion: the contract approach may work, but...

The study shows that a strategy based on incorporating OHS in tender materials and contracts between developers and suppliers can be a successful strategy. But in order for it to be so, the theory based analysis shows that special requirements are set to the developer's organization.

- For this to work, it is not enough to only a special contract. You should be aware that network relations based on trust are to be developed between the developer's organization and the contractor.
- As regards small (and probably also large) contractors, it is necessary that the developer's organization sets side staff resources to handle these network activities.
- There are special competence requirements for this staff. First, they must possess in-depth knowledge of requirements and norms, the underlying basis, and ways to fulfil them. But

they must also be able to see their activities in a greater organizational context. Lastly, in continuation thereof, they must be able to take part in the organizational games played to ensure that OHS considerations are rightfully included in ongoing discussions regarding development and operation of the construction process.

The study also shows that this approach entails positive gains, not only as regards OHS, but also as regards quality and probably the total costs.

Lastly, the study also indicates that the contract strategy is not the only strategy. In the group of enterprises termed OKB, several build long-term relations based on trust, which also affect norms and behaviour towards safer and better work sites in terms of OHS.

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