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Construction-process: Fragmentation or integration?

Some international experiences

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Recent projects of contractors and project-developers are increasingly realized in an international scope. Also the Dutch construction industry becomes more active in Europe and other parts of the world, while companies from abroad become more active in the Dutch construction market. Although several Dutch companies had already activities and experiences in other parts of the world, several of these companies encountered specific problems when working in Germany. After falling of the Berlin Wall in 1989 it became clear there would be an enormous construction market, and also the other East-European countries became interesting. But it seems that the entering of the German market by Dutch contractors was and is still quite difficult.

The research, described in this article, is part of a Ph.D project, which searches for possible backgrounds for differences between the Netherlands and Germany in the construction-management process. To get a more practical view on the research-area, there has been created a possibility for a partly-continuous investigation inside some contractors and project-developers in Germany, which are from Dutch origin. One specific case-study according the realization of two hotel-projects in Germany is being described shortly in this article. The comparison is being made by investigating theory and practical experience, mainly according problems in construction-management and working with people.

Keywords: Managing the project, project-control, conflict-management, information, win-win-situation

1 Introduction

1.1 Background of the research

The opening of the European borders has been an actual topic in the recent industrial community, which increasingly results in an active looking for possibilities for being active abroad. Also the construction-industry looks over the border, partly encouraged by the results of several investigations, made by specific commissions. The so called "Commissie Nijpels" found out, that it was essential for Dutch contractors to get a more integrative attitude, depending on the market-needs. Cooperation between public and private partners would also become an important issue [Nijpels et al, 1992]. Also the so called "Atkins-report" recommended a more cooperative attitude. It mentions aspects like marketing, research and more emphasize on "value for money" (quality, time and cost) to be

some of the most important issues for contractors and project-developers, when they will be active in the near future [Atkins et al, 1993]. In addition to that a cooperative attitude between the parties is then important, as Latham has mentioned. Also Tijhuis and Maas are emphasizing this in their research about specific case-studies in the Dutch-German construction industry [Latham, 1994; Tijhuis and Maas, 1996a].

To create a strong position for companies on the international construction-market, it seems it is necessary to have a strong position on the national market. Several governments have been starting research-projects, in which comparisons are being made between the national and international construction-markets, according structure and activities of the parties involved. As an example, we were involved in such a project, initiated by the French government [PCA, 1994]. But also companies by themselves found it increasingly important to get more insight in the problems, occurring when acting abroad. Especially the situation in Germany was and still is quite unfamiliar to many of them. As we found out during first investigations in Dutch companies, being active in Germany, there were much problems they encountered. Some issues were i.e. problems according [Tijhuis, 1992]:

- a. ownership of land;
- b. conflicts with clients according delivered products (buildings);
- c. quite "unreasonable" demands from the clients (as the contractors mentioned it);
- d. fragmentation of processes of project-management and supervising.

It became clear that it would be interesting to start up a research, covering a Ph.D-project, that was investigating for backgrounds for differences between the Netherlands and Germany in the organization of the construction-process. Therefore the activities and organizations of contractors and project-developers on several building-projects, being prepared and realized in the developing regions of the former East-Germany, were mainly the subjects of the research. Also companies from other countries were being partly investigated when possible. The research was started up in 1993 at the Eindhoven University of Technology, faculty of Building and Architecture. The University Centre for Building Production (UCB) is the institution, which coordinates this research-project.

During the research, it was very interesting to hear reactions of several well-known parties in that construction-market. A manager of one of the companies even told, that "...our company is active in several parts of the world, including i.e. the United States and China, but we would like to withdraw our activities in Germany as soon as possible". Reason for this was that (according his reaction) there was a more or less "conflict-seeking attitute" in that market, instead of a "cooperative-attitude" [Tijhuis, Maas and Sanders, 1995]. This could be one of the main problems for entering the German market.

1.2 Scope of the research

As pointed out, the research is being carried out on a theoretical basis at one hand and enclosures several practical investigation inside contractors and project-developers at the other hand. During the research it became clear, that most problems in the construction-process occur when delivered technical specifications do not fit to the demands of the client. In many cases the rising of a conflict was caused by such errors.

But, there was a very specific way we encountered: Several contractors i.e. remarked, that the way of fragmentation of the supervising of the process by the client (according i.e. quality, time and cost) caused a lot of problems in the field of coordination and communication. In combination with the already mentioned "conflict-seeking attitude" by several clients, it points out the main scope of the research: Looking for backgrounds for differences between the Netherlands and Germany, especially in the fields of:

- 1. organizational aspects (integrated versus fragmented construction-processes);
- 2. cultural aspects (conflict-seeking versus cooperative attitude).

In short these backgrounds will be described in this article, illustrated with one of the investigated case-studies in the region of the former East-Germany.

2 Several problems when acting abroad in the construction-industry

2.1 Introduction

When a company is acting abroad as a contractor or project-developer, it will be encountering a lot of problems, which have to be solved. Some of these problems, which are often occurring, are for example: Different languages and cultural backgrounds, specific governmental regulations, different working-skills of local employees, etc. In fact these problems can be divided into three categories, which are problems according:

- 1. Laws and regulations;
- 2. Construction-process;
- 3. People.

Some aspects of these problems will be mentioned in short according acting in developing regions in general. The second and third category (contruction process and people) will be worked out in a more specific way in a case-study, according some recently investigated practical experiences of a project-developer from mainly Dutch origin in the region of the former East-Germany.

2.2 Laws and regulations

Local laws and regulations are given restrictions within which companies have to work. They cannot change them according their national laws and regulations. This can cause problems, which they simply have to live with: They do have to learn about the local laws and regulations, while local projects are being realized in this scope. Some of these aspects are mentioned by for example Elkarkouri, in the case of construction activities in islamic countries. PCA has given some examples for France, Germany, Holland and Finland [Elkarkouri, 1992; PCA, 1994]. The importance of knowledge of local laws and regulations is clear then, especially when for example contractual problems occur.

In the case of developing regions, and especially developing countries, some specific aspects are actual: In much cases these countries or even regions are getting a more or less new national order. In that way one can have the advantage that laws and regulations are in development, according "new" experiences. This is for example the case in dispute-resolution, as Pearl describes for the situ-

ation in South Africa after the years of "apartheid". Problem can be then, that those countries are not willing or able to prepare a socio-political transformation for setting new generally accepted standards according for example resolution of contractual disputes [Pearl, 1994]. Those transformation-processess in general can take a lot of time, and can on the other hand also cause problems according i.e. "unclear" continuously changing-procedures of those laws and regulations.

Besides the mentioned aspects, there is also the risk for expropriation of the company or projects by the local government. This is a general problem, actual in developing countries but also in other countries in general, as Wells and Gleason mentioned. It can be the case with for example foreign companies, being expropriated in certain countries in the Third world [Wells and Gleason, 1995]. Such issues can be points to handle with, which you can hardly influence directly when you are active in such regions. Although these aspects could be important when acting abroad in general, they will not be the subject of this article.

2.3 Construction-process

When planning, preparing and realizing buildings, it is important to create a construction-process which reduces time and cost, and increases quality. To reach these goals, several types of construction-processes can be choosen. As for example Tijhuis, Maas and Spekkink described for the situations in the Netherlands, one can choose i.e. for three main types [Tijhuis, Maas and Spekkink, 1992; Tijhuis and Maas, 1992]: The (1) Traditional way (where the architect is the central supervising partner), the (2) Building-team way (where the experience of a contractor is being used in a very early stage of the planning-process) or the (3) Turnkey way (where the client chooses for a more or less "standard" building, mainly realized by one organization). Also a way of working with Design & Construct gives possibilities for realizing projects, although in that way the influence of the client can become quite low, and the risk for the contractor can become quite high, as it is in turnkeyprojects. De Ridder mentions, that it would be important to reduce the risk of the contractor when using design & construct, while the contractor will encounter several unexpected problems during problem-solving in the design-phase. Introducing possibilities for rising prices after starting of their (design)tasks, instead of working with continuous fixed-price contracts, would then be one of the solutions [Ridder De, 1994; 1996]. The foreseeing of possible risks will then be one of the main issues, while having knowledge and experience with former projects will then be playing a very important role. And this not only for the design-phase, but also and especially for the constructionphase.

According results from a research from Tijhuis, Maas et al, investigating effectiveness of types of construction-organization in realizing office-buildings, it became clear that in the Netherlands in the period between 1986 untill 1993 the building-team was the fastest, and respectively turnkey and traditional were slower. Especially turnkey resulted in lower construction costs, in regardance to building-team and traditional. The building-team was also cheaper than the traditional [Tijhuis, Maas et al, 1994; 1995].

In fact it pointed out, that a combination of a turnkey-way within a building-team concept could result in an efficient construction-process and a cheap building-project. The in the Netherlands quite often used way of a public-private-partnership points in that direction. As an example the "Kombinatie Schiphol Spoortunnel" can be mentioned as a quite large project, where the building-

team is being used for reasons of by example the advantage of having construction-expertise and experiences in an early stage of design as possible [kss, 1992]. The influence of the client can be still strong in such teams.

In Germany on the other hand the way of working with building-teams is not quite common, as PCA mentions. The traditional way, with several fragmented processes, is being used quite often [PCA, 1994]. Also Kreifels mentions that the traditional way is being used in general in Germany, with the role of the architect as a still very important one [Kreifels, 1993]. At present there are also some construction-processes in Germany, which are becoming quite equal with the building-team, called for example as a "Budget-vertrag".

In Figure 1 there is given a schematic view of the organizational structure of a Dutch (a) and a German (b) way of organizing the traditional way for construction-process. The main functional and contractual relationships between the several parties are being represented in the figure [PCA, 1994; Tijhuis, Maas and Spekkink, 1992].

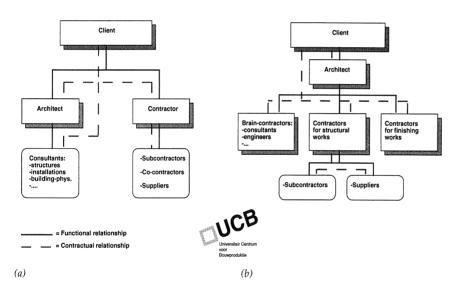


Fig. 1. Schematic view of the organizational structure of a Dutch (a) and German (b) traditional way of organizing the construction-process [PCA, 1994; Tijhuis, Maas and Spekkink, 1992].

It can be seen from Figure 1, that the German system uses a more fragmented way of the construction-process than the Dutch system. Reasons are more or less enclosed within the German building-regulations, especially in the vob ("Verdingungsordnung für Bauleistungen"). These regulations are compulsory for especially public clients, to use such a way of fragmentation within the construction-process. In fact one has to try then to give the building-tasks by tendering to as much (sub)-contractors as possible, the so called "Teillosen-vergabe" [vob, 1993].

In a more general way the cooperative approach in a building-team as an alternative is also being used in German projects. As Tijhuis and Maas described in an investigated case-study, this

approach gives good possibilities to reach the set goals. A win-win-attitude for all parties involved should then be the "lines" along which the whole construction-process is being carried out, instead of seeking conflict-situations [Tijhuis and Maas, 1996a]. Providing the right information on the right place to the right parties should then be one of the main keys for a successful construction-process.

2.4 People

For a contractor who works in regions abroad, the people are very important. At one hand the people who are directly involved in the project (i.e. client, employees) and at the other hand people who are indirectly involved (i.e. neighbours, councillors). Information and communication plays an important role in preventing problems with those people involved. When a project can cause problems with neighbours / citizens, for example according location or activities (i.e. piling-works at the building site), it will be important to inform these people as soon as possible in the planning-process. This can prevent a lot of possible negative consequences, as Van Riemsdijk has mentioned [Riemsdijk Van, 1994]. Besides that, information, and especially the lack of it, plays a very important role in reducing the risk for conflicts during the construction-process, as Mohsini described [Mohsini, 1984]. Cultural habits and backgrounds of the people involved in general are playing other important roles. These cultural habits and backgrounds can even differ between regions in the same country. Especially in the case of company-culture, Sanders and Neuijen have described that there can be also much differences between companies, even when they are i.e. neighbours from each other [Sanders and Neuijen, 1987].

3 Some specific problems in the region of former East-Germany

3.1 Introduction

The background of the research, part of this paper, mainly focusses on activities of contractors and project-developers in the developing region of the former East-Germany. When looking at the situation in the former East-Germany after the falling of the Berlin Wall in 1989, there has been an officially merging by law with the Federal Republic of Germany in 1990, the FRG [Münch Von, 1990]. At once this meant, that the former national laws and regulations were put aside, and the existing laws and regulations of the FRG were put instead of them. Also some special regulations were made with the intention to get a smooth adaptation to the new situation, for example according investments and taxes. This situation gives the opportunity for contractors and project-developers in the FRG, and for those from abroad working there, that according laws and regulations they should have in fact easy possibilities to work successful in these new regions, while they know in general the laws and regulations.

But, during preparation and realization of building-projects in specific those new regions, some structural problems are occurring. The more important of them are in short:

- 1. The ownership and buying of land;
- 2. Procedures according building-permissions;
- 3. Construction-cost, -time and -quality.

In short the mentioned problems are being described in the following part.

3.2 The ownership and buying of land

Having reliable information of the ownership of land is very complex. Especially problems occur in this field, while the government has to look who is the real owner. Reasons for this are that in the past circa fifty-seven years (from circa 1932 to 1989) several land was expropriated from the original owner by the former government. Also a problem is the need for changing the former land-registration towards modern methods of registering. When the real owner is not known, it is almost impossible to buy the land. And when owners are known, and buying is possible at last, the long time for procedures causes problems with for example several mortgages for the several individual housing-clients; this, while the bank does not yet have the written assurance ("Auflassungs-vormerkung") that the land is officially owned by all these clients.

All these sorts of problems cause long periods for preparing a project, and take a lot of money. These problematic situations cannot directly be influenced by private parties, as the contractors or project-developers are. A more or less solution is that the preparation-periods can be shortened by financing the land by the contractor or project-developer themselves (acting themselves as one client). Afterwards, during construction, the company then transfers the mortgages to the several housing-clients. But this can result in an increase of the (financial) risks for those companies.

3.3 Procedures according building-permissions

Before starting a building-project, you need a building-permission. In general this is also the case in developing countries or regions. As in other countries, also in the former East-Germany these procedures can take a lot of time, while it is clear that building-activities have been increasing there enormously in the past years [Knechtel, 1992; ZDB, 1994]. This causes a lot of work for i.e. municipalities for preparing and controlling these building-permissions. In addition to that, a building-project can only be started after the structural design and calculations have been approved by a special qualified structural engineer (a so called "*Prüfstatiker*"). Also these procedures take a lot of time because only a selected number of such engineers are approved to work as a Prüfstatiker. Besides that it seems that there is quite low equality in results and/or comments in those control-procedures by Prüfstatiker, although they work according the same regulations and (technical) standards. Therefore it can happen, that a Prüfstatiker in one part of the region is more or less rejecting a structural design, while one of his collegues in an other part of the region approves it. It may be clear that all these aspects can result in quite difficult procedures.

3.4 Construction-cost, -time and -quality

Due to long preparation-periods, as results from for example the above mentioned problems and procedures, the total construction-cost are increasing. Therefore several contractors and project-developers try to shorten those periods, but in fact they cannot be influenced directly by them: These procedures are settled by governmental decisions. Although procedures take time, resulting in an increase of construction-cost, it is still important to care for the wished quality to be reached. Looking at the problems mentioned here, they have to be solved when possible before starting to realize building-projects in such a developing area. To realize projects according the needs of the client (especially according cost, quality and time), it will be necessary then to influence procedures directly there where it can be done by contractors or project-developers: In the construction-process,

for example during preparation and at the site. The goal is the reduction of construction-cost and -time, while keeping the wished and offered quality.

3.5 Solving the problems: The only solution for successful activities?

It seems that the solving of the mentioned main-problems in the described East-German regions could effectuate in successful activities for i.e. contractors and project-developers, active in those regions. But is that really true? As far as this research-project has pointed out this is not the only real solution, and the main reason is, that "building is a people"s business", to refer to Sikkel wo said that "Bouwen is mensenwerk" [Sikkel, 1975]. And in that way the roles of the people involved (client, architect, (sub)contractors, advisors, municipality, suppliers, neighbours, etc.) are very important ones.

In the construction-process it is therefore necessary to have a good education of (local) employees, combined with the understanding and willingness to cooperate with each other. As Tijhuis and Maas have described, this attitude will be one of the ways to solve several occurring problems when acting abroad [Tijhuis and Maas, 1996b].

In the described case-study the role of such a cooperative attitude during project-progress will be illustrated in short.

4 Case-study: Realizing hotel-projects in Germany

4.1 Introduction

In the past years, the research has been carried out within some case-studies which took place in the region of the former East-Germany. In that region more or less at the same time two hotels (a) and (b) were being realized. Interesting issue was, that there were two different clients, but one and the same contractor. One of the hotels (a) was being built for a German client, which preferred a fragmented construction-process, especially shown by the manner of project-supervising and control. The other hotel (b) was being built for an association of a Dutch/German client, who preferred an integrated construction-process, also especially shown by the manner of project-supervising and control. The contractor acted as a more or less general contractor, who was from Danish origin. So the projects were realized in general with either German and Danish people or Dutch, German and Danish people.

4.2 The projects

A short description of the project-characteristics is as follows:

Both hotels consisted of a concrete construction, with prefabricated sanwich outer-walls, slabs and inner-walls. The elements were transported to the site, and assembled with the use of in-situ concrete. Windows, roof-structures and installations were mostly prefabricated too, and installed at their place at the site. Also the bathrooms and toilets for each room were prefabricated, as complete units, and were already installed before "closing" the floor with the slabs for the next floor. The hotels were quite fully equipped, and had for example a restaurant, conference-rooms, sauna, etc. Hotel (a) was the smallest one and had about 150 rooms. Hotel (b) was larger, and had about 265 rooms. They were quite simultaneously under construction, by the same contractor.

4.3 The fragmented process for hotel (a)

4.3.1 The construction-process

When preparing the realization of this hotel, it looked not a more difficult one to build than other usual hotels. Therefore the contractor could in most cases use his own methods and construction-details. In that way the original design of the hotel was "translated" into building-systems, which the contractor was used to work with. This in general can assure a good and smooth construction-process, especially when the relationship between client and contractor is being kept in an atmosphere of cooperation. And that was in the beginning more or less the case, untill the construction-process was being started at the site. There a complete supervising-team was installed by the German client, to look and to assure the wished and offered quality was reached. In Figure 2 the schematic structure of this team is presented.

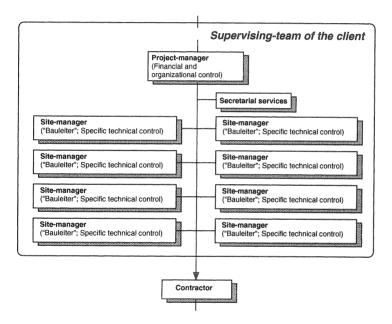


Fig. 2. Schematic view of the supervising-team for controlling the construction-process of hotel (a) at the site.

4.3.2 The people

The German client had installed a supervising-team, consisting of a project-manager with a lot of site-managers, assisted by a secretary-office. All these site-managers had a specialism, depending on the part of work being under construction by the contractor at the site. Decisions about specific problems had to be discussed continuously with each other, and therefore it took quite a long time to make decisions for choosing the right solutions.

Some specialisms were for example: Mortar-slabs, tiles, stucco, windows and curtain-walls, etc. For several of these and other specialisms their control-tasks were mainly the looking for i.e. cracks,

colour-differences, way of working, details, etc. But this was in general not the problem the contractor experienced. It mostly was the way this team reacted at some problems. It seemed that for every problem, small or large, they had to act in a very formal way, looking constantly for who was "guilty" to problems, instead of looking for a solution for them. They immediately sent written complaints to the contractor, as for example also the vob gives recommendations and regulations for [vob, 1993]. But they made it in that way even more problematic for the contractor than in fact was necessary. In short: The client and his supervising-team seemed to show a general feeling of distrust to the contractor.

4.3.3 Results

The showed feeling of distrust by the client resulted in a more or less conflict-situation, which delayed the construction-process in a strong way. While the client in fact had the full right to act in this way, and use such an "over-organized" supervising-team, the contractor felt this as a sign, that they did not trust him and his work. And that, while he had a large experience in realizing hotel-projects, even in other parts of Europe. In the last part of this article some comments will be made according these results.

4.4 The integrated process for hotel (b)

4.4.1 The construction-process

Also the preparation and realization of this hotel did not look more difficult than other usual hotels. As within hotel (a) the contractor could in most cases use his own methods and construction-details. The original design of the hotel was also "translated" into building-systems, which the contractor was used to work with, what in general can assure a good and smooth construction-process, as mentioned. An important difference with the other project was, that especially the relationship between client and contractor was being kept in an atmosphere of cooperation. And not only in the preparation-phase, but also in the realization-phase, during the whole construction-process. Within this project the Dutch/German client used a rather small supervising-team, to look and to assure the wished and offered quality was being reached. Figure 3 presents the schematic structure of this team.

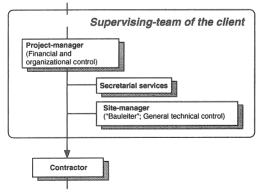


Fig. 3. Schematic view of the supervising-team for controlling the construction-process of hotel (b) at the site.

4.4.2 The people

As a difference with the other (German) client, the Dutch/German client had installed a supervising-team, consisting of a project-manager with an assisting secretary-office, and with only one site-manager. This site-manager was a generalist, and could therefore decide quite quick for choosing the right solution for problems. And of course also this site-manager was controlling very carefully the progress and quality of the several construction-works, as the others did, too. But that was not the problem to the contractor. During this construction-process the team reported quite exactly about problems, as also the VOB recommends [VOB, 1993]. But they did it not in such a formal way like looking for who is "guilty" for the problems. No, they continuously tried to look for the solution for problems, to be reached in good cooperation. In that way it seemed that the client and his supervising-team showed a general feeling of trust to the contractor.

4.4.3 Results

It seemed that especially the use of showing feelings of trust by the client in the project-organization resulted in a more or less cooperative-attitude for all parties involved. Therefore the construction-process was not being delayed in general, and also the wished and offered quality was being reached. The contractor felt this attitude as a sign, that they trusted him and his work. And that seemed to be the right attitude, while he had a large experience in realizing hotel-projects, even in other parts of Europe. In the last part of this article some comments will be made according these results.

5 Conclusions

When reading the above described case-studies, one can for example conclude that only the strong fragmentation of the construction-process, and especially during construction and supervising, could result in conflicts. Therefore the fully integrated and cooperative attitude would be the only right one. But that is not what this article is only pointing at. It especially points at the fact that, when using a fragmented organization, it normally results in several contracts and points of exchange from information. When you use an integrated organization, with as less different parties as possible, it can reduce these contracts and number of points for exchanging information. The procedures and responsibilities within the contracts have to be designed then as best and especially as clear as possible. This way will also reduce the risk for conflicts, while usually the rising of conflicts have their roots in errors in communication (i.e. contacts) and information (i.e. contracts) between the different parties, as also Davidson and Mohsini and Nooteboom described [Davidson and Mohsini, 1987; Nooteboom, 1990; 1991]. Important is then to hold the atmosphere of cooperation and trust between each party.

6 Discussion

In this article it may be clear that the cooperative-attitude is being promoted in a quite strong way. But within that way the offered construction-quality , -cost and -time have to be the main-goals to

be reached by the project-organization. Besides that it must be clear that the need for clear and real descriptions of procedures and responsibilities within contracts and other information is very important. And that especially, while the attitude of the client in general seems to become a more conflict-seeking one: The solution of an increasing number of conflicts is being carried out by the use of lawyers, instead of directly deliberating between parties involved. As i.e. Van den Berg mentioned: "The construction-industry is a paradise for lawyers" – "De bouwwereld is een paradijs voor advocaten" [Berg Van den, 1995].

Although the use of lawyers does not necessary lead to a hardening of the conflict, as Blake and Landsberg mentioned, it can be still the result. They emphasize therefore that the role of the lawyer in construction-industry should be especially in the earliest phase of the process for preventing conflicts, and then specifically "...as consultants rather than harbringers of litigation" [Blake and Landsberg, 1994]. But a problem for companies, especially for those who are acting abroad, is that every country has its own legal systems and market-aspects. So knowledge of these specific legal and market-aspects is then very important, as for example Stevens mentioned: "The global market is full of juridical pitfalls" – "De wereldmarkt zit vol juridische valkuilen" [Stevens, 1995].

Looking to the above aspects, it may be clear that using a lot of formal contracts and supervising-activities could be a solution for reducing possible contractual risks. But then we see a dilemma, as became clear in the case-studies: While the client in fact had the accepted right to act in a very formal way, and use for example an "over-organized" supervising-team, it resulted more or less in an angry contractor, and also an angry client. A specific reaction from the contractor was for example: "...with you -client of hotel (b)- I would like to build other hotels at any time, but with them -client of hotel (a)- never again...". And that made the difference between the experiences in the both case-studies quite clear.

The described issuses indicate that using formal procedures and contracts may become on the one hand of increasing importance for preventing conflicts in the (national and international) construction-industry, but on the other hand they also can be the reason for the arising of conflicts. In short: A lot of contracts and formal supervising-procedures can be a sign of distrusting each other. This problem could possibly be solved by using a cooperative attitude within an integrated organization, which can reduce the fragmentation and the need for much contracts and formal supervising-procedures. Referring to a trend like "Lean production" in construction-industry [Koskela, 1993; Lahdenperä, 1995], this solution could be defined as a way of "Lean control" in construction-management. But in the present development of the national and international construction-market this way seems to become a more and more utopian solution. Nevertheless it is at least worth to try it this way.

7 References

ATKINS, W.S. et al (1993), SECTEUR – Strategic Study on the Construction Sector – Final Report – Strategies for the Construction Sector; European Community; november 1993; ws Atkins International Limited et al; Epsom, Surrey.

Berg Van den M.A.M.C (1995) *Hollandsche Beton Groep diep in de put*; quotation in article from Buters G. and R. Sloot in "De Telegraaf"; newspaper; 28 January; Amsterdam.

BLAKE, B. and R. LANDSBERG (1994), Use of construction lawyers to generate profits, not run-up costs; article in "Construction and Management: Recent Advances"; Ed.: Wakefield R.R. and

- D.G.Carmichael; Balkema Publishers USA; Proceedings of the National Construction and Management Conference; 17-18 February; pp.445–492; Sydney.
- Davidson, C.H. and R.Mohsini (1987), *Building Procurement: A Strategic Organization and Management Decision;* paper; CIB-W65; Symposium on the Organization and Management of Construction.
- ELKARKOURI, D. (1992), *Pre-contractual liability in islamic construction contracts*; article in The International Construction Law Review"; Pt.4; pp.544-551.
- KNECHTEL, E. (1992), Die Bauwirtschaft in der EG: Unternehmen im internationalen Vergleich Daten, Fakten, Kommentare; Hauptverband der Deutschen Bauindustrie e.V.; Bauverlag; Wiesbaden, Berlin.
- Koskela, L. (1993), *Lean production in construction*; article in "Proceedings of 10th international symposium on Automation and Robotics in Construction (ISARC)"; 24–26 May; Houston, Texas, USA; pp.47–54; Elsevier; VTT Technical Research Centre of Finland, Laboratory for Urban Planning and Building Design; Espoo.
- Kreifels, Th. (1993), Construction or project management in Germany The structure and its impact on project participants an overview; article in: "The International Construction Law Review"; 1993, Pt.3; pp.326–336.
- KSS (1992), Bouwteam Spoortunnel Schiphol; paper from KSS Kombinatie Schiphol Spoortunnel V.O.F.;
 Amsterdam.
- Lahdenperä, P. (1995), *Reorganizing the building process The holistic approach; thesis*; Tampere University of Technology; VTT Publications Nr.258; vTT Technical Research Centre of Finland; Espoo.
- Latham, M. (1994), *Constructing the Team;* Final report of the Joint Government / Industry Review of Procurement and Contractual Arrangements in the U.K. Construction Industry; HMSO.
- Mohsini, R.A. (1984), *Building Procurement Process: A Study of Temporary Multi-organizations;* Ph.D-thesis, unpublished; Faculté d''Aménagement, Université de Montrèal; Montréal.
- Münch, Von I. (1990), Die Verträge zur Einheit Deutschlands Einigungsvertrag mit Anlagen / Wahlvertrag / Zwei-plus-Vier-Vertrag / Partnerschaftsverträge; Verlag C.H.Beck; 2.Auflage, 1992; München.
- NOOTEBOOM, B. (1990), *Effects of Scale in Transaction Costs*; Research Report nr. RR 1990-12; Faculteit Bedrijfskunde, Rijks Universiteit, Groningen.
- NOOTEBOOM, B. (1991), *Technologie, Bedrijf en Omgeving;* Research Report nr. RR 1991-06; Faculteit Bedrijfskunde, Rijks Universiteit, Groningen.
- NIJPELS, E.H.T.M. et al (1992), Bouwen in Europese competitie Voorwaarden voor verbetering van de concurrentiekracht van het grootbedrijf in de bouw; Commissie Nijpels; Ministerie van VROM; 25 juni; 's-Gravenhage.
- Pearl, R.G. (1994), Winds of change in dispute resolution for an emerging African nation; article in "Construction Conflict: Management and Resolution"; CIB-Proceedings of the Meeting held in Lexington, Kentucky, USA; 16–19 October, 1994; Publication 171; pp. 70–80.
- PCA (1994), Comparaison de la conception et de la conduite de la production sur chantier, et de leurs potentialites d'adaptation, en France, Allemagne, Hollande et Finlande Comparison of production engineering and site-management, and their potential of adaptation in France, Germany, Holland and Finland; Plan Construction et Architecture (PCA), Paris; UCB-Eindhoven, M&C-Paris, Hochschule-Bremen, VTT-Tampere.
- Ridder, De H.A.J. (1994), Design & Construct of complex civil engineering systems A new approach to organization and contracts; dissertation; Delft University of Technology, faculty of Civil Engineering; Delft.

- RIDDER, DE H.A.J. (1996), Verrekenbaar D&C-contract vergt cultuur-verandering; quotation in article from *I.van Staveren*; article in "Cobouw"; Journal; Den Haag; 27 January 1996.
- RIEMSDIJK, VAN M.J. (1994), *Actie of Dialoog Over de betrekkingen tussen maatschappij en onderneming;* dissertation; Twente University, Faculty of Management and Organization; Enschede.
- SANDERS, G.J.E.M. and B.NEUJJEN (1987), Bedrijfscultuur Diagnose en beïnvloeding; Stichting Management Studies, 's-Gravenhage; Faculteit Bedrijfskunde, Rijks Universiteit Groningen; 3e druk, 1989 (1987); Van Gorcum; Assen, Maastricht.
- Sikkel, L.P. (1975), *Uitvoeringstechniek is mensenwerk*; lecture; Eindhoven University of Technology, faculty of Building and Architecture; Eindhoven.
- Stevens, W.F.C. (1995,) *De wereldmarkt zit vol juridische valkuilen; quotation in article from Heij J.J. in "Intermediar"*; magazine; Vol. 31, nr. 49; pp. 29; 8 December 1995; Amsterdam.
- TIJHUIS, W. (1992), *Voorstel promotie-onderzoek*; Eindhoven University of Technology, faculty of Building and Architecture; internal report (unpublished); 1 December; Eindhoven.
- TIJHUIS, W., G.J. MAAS and D. SPEKKINK (1992), *Types of construction organization in the Netherlands*; report; University Centre for Building Production (UCB), Eindhoven; EGM Onderzoek, Dordrecht; published as SBR-report; Stichting Bouwresearch (SBR), Rotterdam; November 1992.
- Tijhuis, W. and G.J. Maas (1992), Samenwerking in de bouw Fasering van het proces, procesfunkties, taken, verantwoordelijkheden, participanten en strukturen; Lecture-notes nr. 7244: "Bouwprocesleer"; Chapter 3; code 7U300; Eindhoven University of Technology, faculty of Building and Architecture: November; Eindhoven.
- Tijhuis, W., G.J. Maas et al (1994), *Investigation of Building Organizational Forms*; report; University Centre for Building Production (UCB), Eindhoven; June 1994.
- TIJHUIS, W., G.J. MAAS et al (1995), Traditioneel, Bouwteam of Turnkey Keuze-instrument voor opdracht-gevers; article in journal "Bouw"; Vol. 50, Nr. 5; pp. 37; Misset Uitgeverij, Doetinchem; May 1995.
- TIJHUIS, W., G.J. MAAS and G.J.E.M. SANDERS (1995), NEDU-Bouw Promotieproject Uitwerking van open discussie, gehouden tijdens expert-panel d.d. 6-12-'95 te Utrecht, ter verifieëring van uit de theorie en case-studies opgestelde Werk-hypothesen; internal report (unpublished); Eindhoven University of Technology, faculty of Building and Architecture; December; Eindhoven.
- TIJHUIS, W. and G.J. MAAS (1996a), *Project-development in Germany: Example of a way of working;* paper; CIB-W92 proceedings of conference: "North meets South Developing Ideas";
- Ed.: Prof.Rob Taylor; pp. 592–601; University of Natal, Durban; 14–17 January 1996; Durban.
- Tijhuis, W. and G.J. Maas (1996b), Integration in construction-process: The way of starting in developing countries? Example in the former East-Germany; paper; to be published at CIB-W65 an W92 conference: "Shaping theory and practice"; to be held at Strathclyde University, Glasgow; 28 August 3 September 1996; Glasgow.
- voв (1993), Verdingungsordnung für Bauleistungen; Werner U. und W.Pastor; Stand 1.Mai 1993; Verlag C.H.Beck, München.
- Wells, L.T. and E.S.Gleason (1995), Is foreign infrastructure investment still risky? Developing countries are courting investors. Is it safe to say yes?; article in "Harvard Business Review"; September-October 1995; pp.44–55; Boston.
- ZDB (1994), Analyse + Prognose '94 Bauwirtschaftlicher Bericht 1993/94; Zentralverband des Deutschen Baugewerbes; ZDB Schriften 38; Köllen Druck + Verlag; Bonn.