Procurement of a Third party logistics company

A possible benchmarking method

Author: Damon Virta
 Supervisor: Väino K Tarandi

Stockholm 2012
<table>
<thead>
<tr>
<th><strong>Title</strong></th>
<th>Procurement of a Third party logistics company</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Authors</strong></td>
<td>Damon Virta</td>
</tr>
<tr>
<td><strong>Department</strong></td>
<td>Real Estate and Construction Management</td>
</tr>
<tr>
<td><strong>Master Thesis number</strong></td>
<td>155</td>
</tr>
<tr>
<td><strong>Supervisor</strong></td>
<td>Väino K Tarandi</td>
</tr>
<tr>
<td><strong>Keywords</strong></td>
<td>Third party logistics (3PL), Benchmarking, Partnerships</td>
</tr>
</tbody>
</table>
In an effort to reduce waste in construction projects, hence promoting value creation, the focus on the construction logistics becomes increasingly important, especially with increasing complexity of the project. This is in order to coordinate and effectively plan the routines and deliveries that occur regularly at the construction site. In an effort of becoming more efficient regarding this matter and to reduce the amount of waste, procurement of a third party logistics company that conducts all necessary logistical activities has become more and more recognized.

The purpose of the master thesis is to analyze the procurement of a third party logistics company (3PL) and how it has been handled during a project life cycle and how to optimize this type of solution as a partnership and as a benchmarking method. Finally client perception and satisfaction of the executed work is analyzed, all of which are summarized in the research questions stated below:

- How has the collaboration with the procured third party logistics company (3PL) been conducted during the project life cycle?
- How is it possible to develop and optimize the collaboration with a 3PL in order to achieve better results in the future as a partnership and a benchmarking method?
- What is the client perception and satisfaction of the executed work by the third party logistics company?

The theoretical chapter will serve as a foundation of the thesis where the relevant concepts are described complemented with a comparative case study of two projects with relevance to the stated questions. The case study consists of documents and interviews with key participants.

The result will show a holistic profitability with additional suggestions to further develop this type of collaboration as a benchmarking method, what is the next reasonable step of further optimization regarding 3PL procurement and what generalizations can be made.
ACKNOWLEDGEMENT

This master thesis is written for the department of Real Estate and Construction Management at Kungliga Tekniska Högskolan during the spring of 2012 in collaboration with the company Projektbyrån. The master thesis is a requirement in order to graduate from the program Civil Engineering and Built Environment and track Architectural Design and Construction Project Management from KTH. I want to sincerely thank those who had made this master thesis possible.

Thank you;

Väino K Tarandi, Supervisor, Kungliga Tekniska Högskolan
Patrik Lindgren, Svensk Bygglogistik AB
Rolf Gullberg, Projektbyrån

Additional thanks to the interviewees who gladly conducted interviews.

Damon Virta
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Science thesis</td>
<td>3</td>
</tr>
<tr>
<td>Abstract</td>
<td>4</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>5</td>
</tr>
<tr>
<td>Introduction</td>
<td>8</td>
</tr>
<tr>
<td>Background</td>
<td>8</td>
</tr>
<tr>
<td>Purpose</td>
<td>8</td>
</tr>
<tr>
<td>Research problems</td>
<td>9</td>
</tr>
<tr>
<td>Delimitations</td>
<td>9</td>
</tr>
<tr>
<td>Thesis outline</td>
<td>10</td>
</tr>
<tr>
<td>Companies involved</td>
<td>10</td>
</tr>
<tr>
<td>Methodology/Data</td>
<td>12</td>
</tr>
<tr>
<td>Research orientation</td>
<td>12</td>
</tr>
<tr>
<td>Research methods</td>
<td>13</td>
</tr>
<tr>
<td>Research data</td>
<td>15</td>
</tr>
<tr>
<td>Theoretical background</td>
<td>17</td>
</tr>
<tr>
<td>Developments in construction logistics</td>
<td>17</td>
</tr>
<tr>
<td>Benchmarking</td>
<td>18</td>
</tr>
<tr>
<td>Partnership as a benchmarking method</td>
<td>21</td>
</tr>
<tr>
<td>Case study Analysis</td>
<td>24</td>
</tr>
<tr>
<td>Planning stage</td>
<td>24</td>
</tr>
<tr>
<td>Design &amp; Procurement stage</td>
<td>25</td>
</tr>
<tr>
<td>Production stage</td>
<td>27</td>
</tr>
<tr>
<td>Hand over stage</td>
<td>29</td>
</tr>
<tr>
<td>Discussion</td>
<td>31</td>
</tr>
<tr>
<td>Conclusions</td>
<td>33</td>
</tr>
</tbody>
</table>

6
INTRODUCTION

BACKGROUND

The construction industry has too long suffered from high construction costs, something that has been debated in many nations. It has also been criticized of being inefficient, old fashioned and corrupt. It is an industry that consists of projects with many different actors unlike most industries; this requires increased coordination in its activities. Several investigations have been conducted by the Swedish government in order to map the causes of the risen construction costs (Josephson & Saukkoriipi 2005).

A contributing factor to the high costs is the amount of resources that is wasted, on nothing. The amount of resources spent on waste is approximately 30-35% of the productions cost of the project. According to Womack and Jones (stated in Josephson & Saukkoriipi 2005), waste could be defined as followed:

"Waste is an activity that consumes resources but does not create any value".

The amount of resources wasted simply on idle workers, unused machines and material wastage are approximately 10% of the production costs (Josephson & Saukkoriipi 2005). It was also according to Womack and Jones (stated in Jones, Hines & Rich 1997) that value creation is "a natural starting point".

In an effort to reduce waste in construction projects, hence promoting value creation, the focus on the construction logistics becomes increasingly important, especially with increasing complexity of the project. This is in order to coordinate and effectively plan the routines and deliveries that occur regularly at the construction site. In an effort of becoming more efficient regarding this matter and to reduce the amount of waste, procurement of a third party logistics company that conducts all necessary logistical activities has become more and more recognized.

PURPOSE

The purpose of the master thesis is to analyze the procurement of a third party logistics company (3PL) and how it has been handled during a project life cycle. It is also to conduct a case study with high relevance to the below stated research questions. The case study is the office project “Kv Loen”. The project management company “Projektbyrån” has hired a third party logistics company “Svensk Bygglogistik AB” to manage the logistics during the entire project life cycle in the project “Kv Loen”. The purpose is therefore to analyze and review the impacts this coalition has had on the project, to analyze all the different activities to the theory in order to see whether there exist any improvements and developments regarding this type of partnership. “Kv. Loen” is also compared to an additional project called “Pennfältaren”, which is a similar project without 3PL procurement, with the purpose to see what types of benefits that can be achieved. Finally the client perception and satisfaction of the executed work is analyzed to understand the success rate of the procurement.
**RESEARCH PROBLEMS**

- How has the collaboration with the procured third party logistics company (3PL) been conducted during the project life cycle?
- How is it possible to develop and optimize the collaboration with a 3PL in order to achieve better results in the future as a partnership and a benchmarking method?
- What is the client perception and satisfaction of the executed work by the third party logistics company?

**DELIMITATIONS**

Certain delimitations had to be made in the master thesis regarding the case study. Case studies can consist of either one or multiple cases depending on the type of research that needs to be conducted. Suitable for this master thesis is a comparative case study, which further is elaborated in the methodology. Nevertheless, the project “Pennfäktaren” had to be limited due to difficulties of accessing relevant documents. The “Kv. Loen” project was at the moment of research in its production stage, consequently affecting the analyzing and discussions regarding the stages that follow.

A second delimitation was also drawn regarding the calculations on profitability considering the procurement of a 3PL. The thesis has a holistic view because of time constraints and the difficulty of translating soft parameters such as client perception and satisfaction into accurate figures.

The third and final delimitation was the spectra of interviews conducted. The selection of interviewees was limited to key participants from “Projektbyrå” and “Svensk Bygglogistik AB” only and therefore not including the opinions of the subcontractors in the research (Interview 2012).
THESIS OUTLINE

- **Introduction**: This chapter states the purpose, the research problems, the delimitations and the companies involved in the master thesis. It gives a quick overview of the whole framework to the thesis.

- **Methodology/Data**: This section describes the different executed methods used to answer the research problems and the theory behind them. Additionally, the chapter addresses the data used to conduct the research.

- **Theoretical background**: The theoretical chapter defines the different concepts which are relevant to the master thesis. They are thoroughly described and applied to the construction industry. This chapter is the foundation to the following analysis chapter.

- **Case study analysis**: The analysis chapter is the main part of the thesis where the case study is analyzed to the collected data and theory which conclude of the final result to the master thesis and its research problems.

- **Discussion**: My own thoughts and opinions are concentrated to this chapter and it will cover the entire master thesis, from initiation to finishing, the researched results as well as a discussion of what could have been executed differently during the whole process and possible future research areas.

- **Conclusions**: This section contains the results and conclusions of the master thesis with regards to the stated research problems.

COMPANIES INVOLVED

The master thesis is written with a joint supervision of both KTH and companies from the construction industry. This enables the master thesis to have an insight in the academia as well as in the industry itself. The companies involved are the project management company “Projektbyrån” and the third party logistics company “Svensk Bygglogistik AB” and are further described below.

PROJEKTBYRÅN

Projektbyrån was founded 1993 and is one of the leading project management companies in Stockholm Sweden today. They work with both large and small projects varying from commercial facilities to housing in all types of delivery methods, ranging from the traditional Design/Bid/Build to complex Construction Management (CM) projects. Today they have approximately 50 employees and employ in addition 20 sub consultants (Projektbyrån 2012).
SVENSK BYGGLOGISTIK AB

Svensk Bygglogistik AB was founded by Urban Wallin in 1998 and is a third party logistics company. The business strategy is to deliver “the right object, at the right place, in time, in the right size” for the contractor after regular working hours, in order to minimize unnecessary interruptions during the production (Bygglogistik 2012). The basic business idea of the company is to prolong the workday for material handling etc. in order to streamline the process and decrease wastage (Interview 2012).
The following methodology chapter in the master thesis describes in further detail how the actual master thesis was conducted. Each decision regarding “research orientation”, “research method” & “research data” is strengthened with a theoretical basis with the intentions of choosing the correct and most appropriate measure in order to achieve the best possible result to the research questions.

**RESEARCH ORIENTATION**

A research orientation prescribes any relationship between the research methods, data and theories as well as the researchers own background and values. When conducting research it is solely supposed to be analyzed, presented and explained. The researchers themselves cannot be biased to the obtained information and speculate whether the theory is good or bad. The starting point for research is to assume and speculate, nevertheless not to accept or reject them without any logical and reliable explanations (Pervez 2010).

There exist two different types of research approaches in order to establish whether the assumptions or speculations are true or false; through either induction or deduction. These two principles provide two alternative ways of research. They are also not mutually exclusive, which means that both can be used to derive to conclusions (Pervez 2010).

**INDUCTIVE APPROACH**

An inductive conclusion is drawn from empirical observations and evidence without having any underlying theory regarding the subject. The theory is the outcome of the inductive research based on findings which originates from observations. Inductive research is often associated with qualitative research methods. Nevertheless, one cannot be completely certain about the inductive conclusions being true since they are all based on empirical observations (Pervez 2010).

The results of inductive research are more or less probable results without complete certainty. Parallels can be drawn to predicting the outcome of an election, the prognosis of the election i.e. the inductive conclusions are not 100 percent certain, however you can consider them as probable results (Pervez 2010).

**DEDUCTIVE APPROACH**

In a deductive research approach the conclusions are drawn through logical reasoning from already existing knowledge. The conclusions are deducted from theory that are not necessarily true, however logical. The hypothesis, built on said theory, is eventually tested and in the end either accepted or rejected. In the deductive research the theory and hypothesis that come first often influence the following research process (Pervez 2010).
USED RESEARCH ORIENTATION

The master thesis was initially conducted and analyzed after the deductive approach. Using a deductive approach was the best way to start since there was a need to establish the relevant theories in order to be able to analyze whether the referential project “Kv Loen” has managed to utilize the cooperation with the procured third party logistics company to its maximum potential. As the research continued, there was a need of further conclusions, which were founded on inductive approaches. The report is therefore based on a combination of deductive and inductive conclusions in order to gain more analytical depth in the conclusions.

RESEARCH METHODS

Depending on the type of research problem and its purpose, different research methods and techniques are more suitable. The research method focuses on how the data should be collected in order to solve the research problem in question. The two types of research methods are qualitative research and quantitative research where the difference lies in procedure rather than in the “quality” of data. The main distinction between the two is that quantitative researcher employs measurement while qualitative does not (Pervez 2010).

QUALITATIVE METHODS

Qualitative methods are more useful when the variables that are to be studied are hard to quantify i.e. difficult to measure, when a certain phenomenon is unique or subjective thereby using an interpretive and rational approach. Examples of such variables are emotions and different social processes which can be found within behavior and social sciences. In general it is common that qualitative methods are most useful when conducting a inductive research approach (Pervez 2010).

QUANTITATIVE METHODS

As mentioned earlier the quantitative methods are more suitable to use when the research problem can be measured and the data can be quantified and allows for statistical analysis. On the contrary to qualitative, here it is more suitable to use a more logical and critical approach to the problem, therefore it is optimal to use quantitative methods for deductive research (Pervez 2010).

Nevertheless, using either qualitative or quantitative methods does not automatically exclude the other. Depending on the research, different methods might be more usable during different stages in the research process. At first stage the quantitative method is more useful, while at the second stage a qualitative method might prove more useful to gain further depth in the research topic (Pervez 2010).
USED RESEARCH METHOD

Due to the fact that the master thesis initially had a deductive research approach, as mentioned above, the study also adopted the most suitable research method. Therefore a quantitative research method was used at first by using relevant project documents from the referential project Kv Loen as a case study in order to be able to apply, measure & test them to the researched theory regarding the concepts of “benchmarking” & “partnerships”. Comparisons and deducted conclusions were made to decide whether or not the procurement of a third party logistic company was suitable, and conclude which areas of the collaboration that were excellent and which areas that were in need of improving.

The conducted case study is compared and analyzed to the found theory. Case studies in general involves data collection from verbal reports, interviews, observations, financial reports, archives, budget & operating statements and finally market & competition reports (Pervez 2010). The documents that were primarily used in the master thesis were procurement documents, meeting protocols, information handouts and delivery schedules. There was also a need to conduct complementary semi-structured interviews; this was because the documents alone were insufficient in order to derive to a reasonable conclusion, hence the need of a more qualitative method. In addition of providing more analytical depth to the research problems, the interviews with certain interviewees provided possibilities of comparison to another project executed by Projektbyrån, a project called Pennfäktaren, since certain interviewees have worked on both mentioned projects. The background for the referential projects Kv Loen and Pennfäktaren are as illustrated in TABLE 1 PROJECT BACKGROUND (Projektbyrån 2012):

<table>
<thead>
<tr>
<th>Kv Loen</th>
<th>Pennfäktaren</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Office project</td>
<td>• Office project</td>
</tr>
<tr>
<td>• CM-organization</td>
<td>• CM-organization</td>
</tr>
<tr>
<td>• Year: 2007-2012</td>
<td>• Year: 2007-2010</td>
</tr>
<tr>
<td>• Location: Central Stockholm</td>
<td>• Location: Central Stockholm</td>
</tr>
<tr>
<td>• Refurbishment &amp; added works</td>
<td>• Refurbishment</td>
</tr>
<tr>
<td>• Procurement of third party logistics company (3PL)</td>
<td>• NO procurement of third party logistics company (3PL)</td>
</tr>
</tbody>
</table>

Due to the fact that the two mentioned projects have multiple similarities and an important key dissimilarity, which is the procurement of a third party logistics company (3PL), the two projects
were excellent candidates to the method “comparative case studies”. This type focuses on studying the same questions in a number of organizations, in this case the same organization, and compare them to draw conclusions (Pervez 2010).

According to Yin (stated in Pervez 2010), the case study approach is preferred in three different situations. The research problem and the topic at hand are applicable to two of the three criteria where a case study is a preferred method:

- “If we want to follow a theory that specifies a particular set of outcomes in some particular situation, ...”; and
- “If we want to study a situation or an organization which has rarely been studied and is unique in its nature, ...”

Therefore the use of case studies as a research method was the most reasonable approach to the research problem.

RESEARCH DATA

The research data used to solve the research problem can be of two different types; secondary data or primary data. Each type has its own advantages and disadvantages when conducting your research. According to Pervez the secondary data is useful to both solve the research question as well as help to understand and explain the problem. It is however important that once using secondary data will require you to question its reliability since the information it provides was originally collected for a different purpose. The major advantages of secondary data is the fact that it saves time and money, broadens the base were conclusions can be drawn and additionally it can suggest a suitable method to handle a particular research problem (Pervez 2010).

However, if the collected secondary data proves to be insufficient and cannot answer the asked research questions, then the reasonable next step is to collect primary data. The main advantage of this type of data is that it’s collected specifically for your study. The data can consist of observations, experiments, surveys and interviews. A disadvantage of primary data is that it can take time and money to collect. Another disadvantage is that if it is not collected with proper tools, methods or procedures it will risk the validity and reliability of the study (Pervez 2010).

USED RESEARCH DATA

The theoretical foundation of the master thesis is based on collected secondary data, consisting of relevant articles, reports and literature to the subject at hand and that could provide the thesis with insights. These have also been researched and published by validated authors within
the field. The used secondary data was both efficient in time and money. Another intention with
the secondary data used was to keep the companies own perceptions of the chosen theoretical
concepts separated from the literature study. Otherwise the study risked its validity if the
companies were compared with their own perceptions of the theory. The primary data was
collected from Projektbyrån as a case study and had a considerable part in the study and
consisted of project documents and interviews, which were eventually compared to the theory
to see if there were any possible improvements to be done in order to use the processes,
procedures or products as benchmarking methods. The interviews conducted were of key
members of the project staff with high relevance and knowledge regarding the case study
project.
THEORETICAL BACKGROUND

The theoretical chapter of the master thesis is the foundation as well as the framework to the deductive approach mentioned above. The chapter includes the concepts considered necessary to the research question, starting with a theoretical introduction to why and how the logistics in the construction industry is developing. This short introduction is followed by a thorough description of the relevant concepts "benchmarking" & "partnerships" and how they ought to be applied and in which situation within the construction industry in order to achieve a better client satisfaction regarding the project by procuring a third party logistics company (3PL).

DEVELOPMENTS IN CONSTRUCTION LOGISTICS

As defined in the Concise Oxford Dictionary: logistics is the "art of moving, lodging and supplying troops and equipment". As stated by L.E. Clausen (stated in Agapiou et al. 1998), that for the construction industry, "logistics comprise planning, organization, coordination and control of the materials flow from the extraction of raw materials to the incorporation into the finished building". Moreover, the concept of logistics in the construction industry is communication between the project participants, flow and scheduling of materials as well as the layout and storage arrangements during the project life cycle (Agapiou et al. 1998).

Based on studies carried out in Sweden by Larsson (stated in Agapiou et al. 1998), Agapiou stresses that there is a need for a logistics model that improves the organization on site as well as the construction processes as a whole. In addition, the model would be a tool that purchases the right quantity of materials and necessary services to the right location on site (Agapiou et al. 1998). The use of creative approaches, innovative thinking and willingness to try something new are critical when problems arise (Thal & Bedingfield 2010). The following suggestion by Normann regarding of a "new strategic logic" in business logistics management (Walters 2008):

"[. . .] managers need to be good at mobilizing, managing, and using resources rather than at formally acquiring and necessarily owning resources. The ability to reconfigure, to use resources inside and particularly outside the boundaries of the traditional corporation more effectively becomes a mandatory skill for managements."
TABLE 2 BUSINESS CHARACTERISTICS (WALTERS 2008)

<table>
<thead>
<tr>
<th>Traditional approaches were/are</th>
<th>New approaches are/or are becoming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command</td>
<td>Integration</td>
</tr>
<tr>
<td>Control</td>
<td>Coordination</td>
</tr>
<tr>
<td>Vertical/hierarchical structures</td>
<td>Holistic/virtual structures</td>
</tr>
<tr>
<td>Suboptimal productivity</td>
<td>Super-optimal productivity</td>
</tr>
<tr>
<td>Reactive market responses</td>
<td>Proactive market responses</td>
</tr>
<tr>
<td>Inter-organizational competition</td>
<td>Inter-organizational collaboration</td>
</tr>
<tr>
<td>Generic and mass customized solutions</td>
<td>Customer specific product-service solutions</td>
</tr>
<tr>
<td>Lagged/limited content/expensive system communications</td>
<td>Instantaneous/comprehensive content/low cost communications</td>
</tr>
<tr>
<td>Restricted interactions</td>
<td>Comprehensive interactions</td>
</tr>
<tr>
<td>Entrepreneurship and intrapreneurship</td>
<td>Interpreneurship</td>
</tr>
</tbody>
</table>

According to Pinto and Slevin, client satisfaction plays a significant role when determining whether or not the project is a success (stated in Thal & Bedingfield 2010).

"If the project meets the technical performance specifications and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people in the parent organization, key people in the client organization, key people on the project team, and key users or clientele of the project effort, the project is considered an overall success."

In addition to the definition above by Baker, Murphy and Fisher of project success (stated in Thal & Bedingfield 2010), Cleland suggests it should be based on the project fulfilling its technical performance objectives and its contributions to the strategic mission of the organization (Thal & Bedingfield 2010). For companies to be able to create client satisfaction, a company must firstly understand the client demand in order for them to be able to manage it (Walters 2008).

**BENCHMARKING**

Developing a partnership with a third party company can be one way to improve a process or product within the company. This type of process could be linked to the concept called “Benchmarking”. It is a systematic approach to a problem where the goal is to identify and monitor an existing innovative process or strategy from another leading organization either within or from another industry and incorporate it into your own in order to improve business performance (Bagchi 1997; Garnett & Pickrell 2000; Jarrar & Zairi 2001; Prašnikar, Debeljak & Ahčan 2005), which is also in line with that partnering also embraces continuous improvement and teamwork as mentioned by Fellows and Harback et al. (stated in Black, Akintoye &
Fitzgerald 2000). Benchmarking is a method used by companies in order to remain competitive or catch up in the market. Benchmarking enables the company to neutralize the competitors’ advantage to the company. Nevertheless, in order to improve your company competitive position the adopted processes must be improved and developed further (Bagchi 1997). It has proven to be a powerful and flexible tool to investigate and manage changes on construction projects, and also to support other strategies (Garnett & Pickrell 2000). The two most common benchmarking methods used are competitive and co-operative benchmarking. Competitive benchmarking involves identifying major competitors' products, technology, services etc., comparing them to the own company and finally determining the efforts needed for improvement. Cooperative benchmarking is not necessarily comparing against companies within the same industry. Regardless it involves comparing against a "best-in-class" organization, adopting the processes etc. and finally adapting & applying them to your own company. The latter method requires more creativeness and adaptable thinking from the management (Bagchi 1997).

The purpose of benchmarking is not only to adopt and apply processes or strategies, it is to analyze and find out the reasons for this and thereby create new business knowledge to be able to create your own strategic decisions. In addition, depending on which companies comparisons are made, the relevance of the data collected can vary, thus the possibility of breakthrough insights (Prašnikar, Debeljak & Ahčan 2005). This is to, in the end, achieve better customer satisfaction (Bagchi 1997).

In general, the data used in benchmarking to create the above mentioned business knowledge can be acquired from (Prašnikar, Debeljak & Ahčan 2005):

- other companies in the group – in this case we are referring to internal benchmarking;
- competitors in the industry;
- other companies in the industry that are not direct competitors; and
- other companies in other industries.

As is illustrated in the TABLE 3 TYPES OF BENCHMARKING below by Harrington, the most relevancy of collected information come from either direct competition or from within the company because of the high comparability level. Although it is likely that you meet difficulties in acquiring business information from the direct competitors. The information with least relevancy is collected from companies from other industries, it is nevertheless from that where the possibility of breakthrough insights is generally the highest since one can create new innovative business knowledge (Prašnikar, Debeljak & Ahčan 2005).
## TABLE 3 TYPES OF BENCHMARKING

<table>
<thead>
<tr>
<th>Data of benchmarked companies</th>
<th>Expected level of collaboration</th>
<th>Relevancy of findings</th>
<th>Possibility of breakthrough insight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other companies in the group (internal benchmarking)</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Competitors in the industry</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Companies in the industry that are not competitors</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Companies from other industries</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

Benchmarking will lead to increased efficiency and effectiveness, it will however require constant monitoring and comparing against the “best-in-class” companies (Bagchi 1997). In addition, in order for benchmarking to be useful it requires for those involved to act as a team, have a consensus view of the process and the appropriate measures (Garnett & Pickrell 2000). The continuous process of benchmarking can be described with the “Deming cycle” or “plan-do-check-act cycle” by Watson, see FIGURE 1 DEMING CYCLE, where the steps can be applied to whatever generic function (Bagchi 1997). This model is a continuous cycle that sets the frame of how one could establish benchmarking within the company.

![FIGURE 1 DEMING CYCLE](image)
PARTNERSHIP AS A BENCHMARKING METHOD

However, if purchasing a third party logistic company (3PL) or entering a logistics partnership, in order for it to be successful it will require open communications, mutual commitment, fairness and flexibility, to be co-operative and collaborative (Tate 1996). Partnering requires an environment of trust and openness between the parties of a construction project in order to be able to achieve the project goal efficiently and without conflicts (Black, Akintoye & Fitzgerald 2000). In addition it will improve operational efficiency, cut costs and mutually increase profitability which will in the end improve the service to the end customer (Tate 1996).

These partnerships ought to be tailored to achieve mutually beneficial relationship to achieve financial and relational improvements (Hofer, Knemeyer & Dresner 2009). As stated by Lambert et al., Bowersox and House & Stank (stated in Makukha & Gray 2004), an important reason for a failed partnership is that it is often assumed that all partnerships are all the same. In addition, other reasons for failed partnerships include incompatible organizational cultures, insufficient trust and communication, imbalance of power which leads to uneven commitment and unclear division of responsibilities. The customer dependency of the 3PL is caused by the customers perceived need of them as a resource; their expertise, planning and performing of complex logistics activities more efficiently and effectively than the firm could either on its own or with other partners (Hofer, Knemeyer & Dresner 2009).

The benefits of the partnerships with engaged participants are that customers have been found to experience high levels of trust and commitment from the third party logistic company (3PL) with regards to their services. While the 3PL’s develop other factors such as organizational learning and enhanced innovation abilities, which leads to improvements in their operational and market performance. By engaging in close customer relationships the 3PL’s can experience higher customer retention and new referrals (Hofer, Knemeyer & Dresner 2009). Another customer benefit these relationships offer is the lower risk of commoditization at the operational level which can depress profits. Differentiation in the firms different resources creates competitiveness and possibilities in new markets (Makukha & Gray 2004). Studies also show that increased client satisfaction is a significant benefit of partnering by all categories of responding organizations that participated in the study (Black, Akintoye & Fitzgerald 2000).

PARTNERSHIPS IN CONSTRUCTION

In essential, the reasons for partnering arrangements as a benchmarking method are to easier fulfill the goals of all involved parties. Nevertheless, not all partnering arrangements will aid in achieving the set objectives, hence there is a need of partnering assessment before procurement (Lu & Yan 2007). Additionally, based on findings by Cheng (stated in Lu & Yan 2007), Lu mentions that strategic alliances in construction should help the parties to gain benefits at project, business and corporate levels. According to a study of Gransberg et al., supported by Scott (stated in Lu & Yan 2007), Gransberg show that partnering will be more beneficial in projects over $5 million compared to smaller projects. Scott states that partnering is more suitable for large scale construction projects valued over $150 million. Although basing partnering applicability solely on absolute cost is difficult due to the price differences between
regions (Lu & Yan 2007). According to Conley & Gregory and Li et al. (stated in Lu & Yan 2007), Conley & Gregory suggest using partnering in projects valued less than $3 million, the project duration must on the other hand be of at least 6 months. A view that is in line with Li et al. that states that partnering may not be appropriate since the development of trust often takes a long time. A long term purchase of a logistics service is crucial in order to achieve the desired customer satisfaction. This could on the contrary cause difficulties with suppliers since the implementation of a new long term strategy into their differing organizational culture is costly and time consuming (Makukha & Gray 2004). Another relevant factor in partnering assessment is the level of uncertainty in the project. Projects with high uncertainty are applicable for partnering since the parties involved can share the risks. The uncertainty is not only based on the complexity of the project based but also on cost, time and quality, it is also related to the function of the project (Black, Akintoye & Fitzgerald 2000; Lu & Yan 2007).

Summarized in the TABLE 4 CRITICAL SUCCESS FACTORS below there exists five critical factors according to Bowersox (stated in Tate 1996) that outlines the level of success of a logistic partnership:

TABLE 4 CRITICAL SUCCESS FACTORS

<table>
<thead>
<tr>
<th>Five CSF:s according to Bowersox</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Selective matching – partners have compatible corporate cultures and values.</td>
</tr>
<tr>
<td>• Information sharing – partners openly share strategic/operational information.</td>
</tr>
<tr>
<td>• Role specification – each party in the partnership knows specifically what its role is.</td>
</tr>
<tr>
<td>• Ground rules – procedures and policies are clearly spelled out.</td>
</tr>
<tr>
<td>• Exit provisions – a method for terminating the partnership is defined.</td>
</tr>
</tbody>
</table>

How these focal points are managed during the different interfaces and stages in the project life cycle between the parties involved, with the purpose of streamlining the processes, includes an early involvement from all participants (Agapiou et al. 1998). In addition, an early involvement of key participants already in the design phase enables potential value increase, stimulates creativity and minimizes unnecessary design costs and time delays (Black, Akintoye & Fitzgerald 2000).

If construction projects are mandated to use competitive tendering on a lowest-bid-basis it can be an obstacle when procuring for partnership (Lu & Yan 2007). This is because according to Chadwick & Rajagopal (stated in Black, Akintoye & Fitzgerald 2000), there exist four key
differences with regards to procurement between a traditional approach and a partnering approach:

- emphasis on cost rather than price;
- long-term rather than short-term focus;
- defect prevention in place of quality checks; and
- single rather than multiple sourcing.

This difference concerning the procurement for partnerships could cause difficulties regarding competitive tendering in the Swedish construction industry since public projects are in some cases steered by the “Lag om offentlig upphandling” which translates to the “Law of public procurement”. The law implies that “Public contracts are the actions taken by a contracting authority to award a contract or a framework agreement for goods, services or works” (LOU 2007 2 kap 13 §). It is also stated that procuring authorities shall treat suppliers equally, be nondiscriminating and that each candidate and tenderer has the right to deliver what the contract is intended for, thereby cannot be excluded. It is however encouraged regarding works contracts that in the requests state names and qualifications on who is to perform the services (LOU 2007 1 kap 9-10 §).
CASE STUDY ANALYSIS

In the preceding chapters in the master thesis the concepts of “benchmarking” and “partnerships” were described and put in context regarding to the construction industry, third party logistics and client satisfaction. The purpose with the master thesis was to analyze how logistics can be developed by procuring a third party logistics company (3PL) and how it can affect the outcome of a project. Several models, frameworks and processes were brought up in order to be able to draw conclusions whether or not the collaboration with the third party logistics company in the referential project was conducted optimally in order to achieve the best possible outcome.

This chapter will bring forth the models, frameworks and processes mentioned in the theoretical chapter and they are analyzed against the conducted case study, which consists of project documents as well as interviews. The chapter is structured in the way that it follows the different stages in a project life cycle.

PLANNING STAGE

This type of method of procuring a 3PL for a construction project was the first one conducted by Projektbyrån and can be considered as a pilot project for this type of coalition. The incentives of procuring a 3PL are several, for instance as mentioned in the theory above, these relationships offer a lower risk of commoditization at the operational level which can depress profits. By implementing this type of collaboration and adapting it to the company structures, it will create competitiveness and possibilities in new markets. The intentions with the procurement and collaboration with Svensk Bygglogistik AB was to better be able to manage the logistics required due to the difficult site conditions. The project was located in the central of Stockholm with only one available street for deliveries (Interview 2012). Hence the procurement of the 3PL, to efficiently organize the site and to plan and distribute the deliveries for the different contractors in order to enable more value creation which is in line with Womack and Jones whom mentioned that value creation is “a natural starting point”. The project itself had a total budget of approximately 700 MKr and a production time of approximately 30 months (Interview 2012). Ideal conditions for a partnership depend on many different variables such as cost, time and complexity. With the prerequisites regarding the case study project, Kv Loen was an ideal candidate for this type of collaboration. The services provided by the 3PL were necessary in order to achieve operational efficiency, cut costs and mutually increase profitability which will in the end improve the service to the end customer as is stated in theory as a fundamental reason of entering in a partnership. The necessity was not only based on the budget and duration, as mentioned above. The high uncertainty of the project regarding the site conditions are also in line with the prerequisites of partnering applicability stated in the theoretical chapter since the parties involved can share the risks.

According to the Deming cycle mentioned in the theory, the process of benchmarking is continuous and should for optimal results involve early involvement of all project participants. The point of time that Svensk Bygglogistik AB was procured was considered to be at the appropriate moment since there was enough time to plan the different logistical aspects in order
to counteract stops in the production and make available more man-hours to be put on value creation (Interview 2012; Josephson & Saukkoriipi 2005). This gave the collaboration and the project itself good starting conditions to be an overall success.

**DESIGN & PROCUREMENT STAGE**

Due to the fact that Kv Loen is a CM-organization, the design and procurement of its contractors are during this stage a continuous process which can provide cost advantages both regarding competitive bidding as well as the ability to fast track the project. Another major advantage of this type of arrangement is that good continuous communication established early among the owner, the designer and the constructor encourages collaboration and allows for critique and influence of the design before the actual bidding. Problems are therefore solved collaboratively because of the incentive to produce the best possible product for the owner (Gould & Joyce 2009).

In order to be able to, not only deliver a finished product to the customer, but to achieve high customer satisfaction within the set budget, the points of time for each of the procured contractors are important. Since Kv. Loen emphasized collaboration with a 3PL, the procurement of Svensk Bygglogistik AB was critical. As previously mentioned in the theory chapter; according to Black, Akintoye & Fitzgerald “…early involvement of key participants already in the design phase enables potential value increase, stimulates creativity and minimizes unnecessary design costs and time delays.” The possibility for Svensk Bygglogistik AB of positively influencing the project diminishes the longer they are kept from the design stage of the project. The procurement order, of when the different contractor types were procured according to the system documents have been finished, is listed below in TABLE 5 PROCUREMENT ORDER (Interview 2012):

**TABLE 5 PROCUREMENT ORDER**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Establishment</td>
</tr>
<tr>
<td>2.</td>
<td>Surveillance</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Logistics</strong></td>
</tr>
<tr>
<td>4.</td>
<td>Demolition</td>
</tr>
<tr>
<td>5.</td>
<td>Frameworks</td>
</tr>
<tr>
<td>6.</td>
<td>Installations and elevators</td>
</tr>
<tr>
<td>7.</td>
<td>Painting</td>
</tr>
<tr>
<td>8.</td>
<td>Glazing</td>
</tr>
<tr>
<td>9.</td>
<td>Ceiling, Floor &amp; Interior walls</td>
</tr>
<tr>
<td>10.</td>
<td>Interior</td>
</tr>
</tbody>
</table>
As illustrated in TABLE 5 PROCUREMENT ORDER the 3PL company Svensk Bygglogistik AB was among the earliest contractors procured for the project. To be more exact, the ability for the 3PL to influence the project design was in the end of the design stage. According to the document in Appendix A, “ANBUDSFÖRFRÅGAN DE 91-9 Logistikserviceentreprenad”, a document created 2009-06-02 and roughly translated as a "Request for Tender" stresses the different prerequisites of the project regarding the logistics and the contractors that are to be procured. Further it states that under the heading “Tider” that the contractor is calculated to start 2009-09-01 whereas the first six months are logistical planning before the start of production in the beginning of 2010. With this in mind, the procured 3PL had a possibility to plan ahead before the production stage was to begin.

Nevertheless, whether or not a key participant was procured in time is irrelevant if the specification of the expected work is poorly described. If the specifications are inaccurate or even incorrect, the 3PL company will have difficulties performing to a high standard. The collaboration between the companies will thereby fail according to the third critical success factor stated by Bowersox (stated in Tate 1996) regarding partnerships. The collaboration will not have the necessary role specifications needed for the parties involved to perform what is expected. Analyzing the documents received from the case study indicates that these precautions have been considered, thereof the creation of an additional document “Omfattningsbeskrivning av DE 91:9 Logistikentreprenad kv Loen, Stockholm” which can be found in Appendix B. The document does not only specify the different roles, it also specifies responsibilities and to what extent each role is expected perform. It also refers to open accounting regarding costs for crew and necessary equipment.

The procurement costs and the costs in general are always an important factor to consider since you always work with a limited budget and it is a parameter that can easily be compared to other projects. The procurement cost for Projektbyrån is in this case regarding the 3PL and is the price of the two officials called “Logistikansvarig” and the “Mottagningskontrollant”, which are roughly translated to “Logistics Manager” and “Reception Controller”, see Appendix B. The services provided by Svensk Bygglogistik AB are paid by the subcontractors using the service, which was also clearly specified in the “Request for Tender” sent out to them. The procurement can vary depending on the size of the project. For projects valued 300 MKr with an approximate duration of 12 months it is more appropriate to procure only one official. The costs for Projektbyrån regarding the 3PL for Kv. Loen is 5-6% of the total cost of 700 MKr and it is more expensive than it would have been if handled in-house. Nevertheless, this cost should be viewed with a holistic perspective since without the collaboration the costs in the planning stage, which now was 30% of the total cost, would have been higher and the production time would have been longer, which in the end would have resulted in even higher costs (Interview 2012). The holistic view of the procurement of a 3PL can in addition be highly associated with the views according to Chadwick & Rajagopal (stated in Black, Akintoye & Fitzgerald 2000) stated earlier in the theory, concerning the four key differences regarding procurement of partnerships if construction projects are mandated to use competitive tendering on a lowest-bid-basis, which is the case in this project.
Construction projects in Sweden are as mentioned in some cases to procure after the lowest-bid-basis due to the “Law of public procurement”, described in the theory. As a company you have to procure the company with the lowest bid if the company can meet the requirements needed to perform the contracted work. The specifications must be carefully specified when you procure the 3PL and subcontractors as well as the order of procurement, not only because of the reasons stated above. If the specifications are poor the risk of receiving low bids from less competent actors increases, actors that have to be procured because of the law of public procurement. Although, some deviations could take place due to the fact that the building is a government building that has certain confidentiality requirements. Should the project on the other hand be a private project, the procurement of subcontractors is not steered by the law of public procurement. Nevertheless, if the 3PL is procured before the subcontractors the collaboration can be added in the specifications. This could affect the amount of bidders as well as the price. There is an increased risk of fewer bids that are more expensive since the collaboration is mandated and the services are paid by the subcontractors, consequently increasing the total price. Although the advantages of 3PL procurement drive the bids down due to the competitive bidding between the subcontractors, which means neutralizes the risk of more expensive bids. Nevertheless, it is important to focus long term and focus on cost rather than price since out of a holistic perspective since the total cost will be lower because of the effective production stage.

**PRODUCTION STAGE**

As stated earlier Kv. Loen follows a CM-organization that enables numerous of different advantages if the project is executed properly. Nevertheless these stated advantages can during the production stage become major disadvantages if any of the key parties involved becomes inflexible, uncooperative or uncommunicative (Gould & Joyce 2009). These stated prerequisites are in line with the earlier stated prerequisites regarding successful partnerships, which are open communications, mutual commitment, fairness and flexibility, to be co-operative and collaborative. Many of these issues can be connected to, if failed, to a lack of communication either between the key participants or throughout the rest of the organization. The communication has to be continuous, as is the benchmarking procedure, and also be both formal and informal. Formal communication can for instance consist of regular meetings between the parties. The formal communication has been, in this case, sufficient enough for not being a deciding factor, see Appendix C & D. Appendix C is a meeting protocol, called “Produktionsmöte-Produktionsledare”, between the production managers from Projektbyrån and Svensk Bygglagistik AB conducted every two weeks. Appendix D is a meeting protocol, called “Samordningsmöte Hus 2”, between Projektbyrån, Svensk Bygglagistik AB and the other subcontractors conducted every week. What is relevant of bringing up with these appendixes is not what is exactly said in them, the purpose is to illustrate the continuity of formal communication not only between key participants but also throughout the entire organization. In addition to the regular meetings, there have been continuous send outs of packing instructions from Svensk Bygglagistik AB, see Appendix E, as well as information to the subcontractors and suppliers of the whole logistics work regarding role specifications, costs, logistics flow etc, see Appendix F. The logistics flow illustrates the recommended approach
regarding material orders and deliveries. These deliveries are in this case summarized into a weekly delivery schedule, see Appendix G, which illustrates all planned deliveries and to which subcontractor it concerns. In large scale projects where a lot of deliveries and planning is necessary, Svensk Bygglogistik AB use a program called “Lognet” where all deliveries are scheduled to prevent collisions and to have personnel available at the time of delivery (Interview 2012). This can be linked to the theory that there is a need for a logistics model that improves the organization on site as well as the construction processes as a whole (Agapiou et al. 1998).

It is however each subcontractors own responsibility to engage in such information which has been sent out. Therefore it is important to create incentives and commitment in order to increase the quality of the executed work. This has been something that has worked well, however not perfect in the Kv. Loen project. A main reason why it worked well is because the collaboration with a 3PL was stated in the specifications from the start when procuring subcontractors, thereby automatically creating incentives and commitment to the project. Problems have occurred at the production regarding the recycling and cleaning of wastage by the subcontractors, a problem that was solved with penalty fees if it had to be executed by Svensk Bygglogistik AB (Interview 2012). In addition, since the collaboration with a 3PL was stated in the specifications, it minimized conflicts and enabled Svensk Bygglogistik AB to better influence the outcome, which has according to previously experienced projects been proven difficult since the collaborations at that time were not stated in the specifications, consequently encountering more resistance from the subcontractors (Interview 2012). Even though the collaboration with a 3PL was specified, there still occurred resistant subcontractors who wanted to handle their materials themselves since the price would have been lower since the company uses hired workforce. However, most of the experienced subcontractors met the new method positively since they were able to put more man hours on value creation, which was also a fact on site. The workers could start working at once each day because of the logistical planning and material handling executed by Svensk Bygglogistik AB (Interview 2012). In order to avoid contra productive actors, more strict specifications regarding the procurement are necessary. For instance specify for a ratio of 80/20 of employed workforce and have a minimum time of employment. The latter specification was not included in the tender requests (Interview 2012). In hindsight there exist few necessary immediate changes when analyzing the production stage. By being stricter in the procurement specification in future projects, for example to specify or send out information regarding the responsibilities concerning recycling and cleaning of wastage minimizes or even eliminates the need to send out penalty fees afterwards and tie up man-hours unnecessarily. Stricter specification is also needed when procuring subcontractors, to for example increase the requirements of the employed workforce with the hopes of eliminating contra productive actors.

Nevertheless, formal communication alone is not sufficient enough for the communication between participants to function. Informal communication such as daily interaction is as important. At regular visits to the site office, observations have been made regarding the allocation of the private offices. Offices belonging to officials from both Projektbyrån and Svensk Bygglogistik AB working closely to the production are located near each other, the same
observation has been made regarding officials working with economy, procurement etc., thereby enabling easier daily interactions between officials concerning the informal communication.

Comparing the projects Kv. Loen and Pennfäktaren with each other, with emphasis put on the production, the main dissimilarity between the projects is, as stated in the methodology, the collaboration with a 3PL. Additional dissimilarities between the two referential projects were the end client. Pennfäktaren which was privately owned, the office floors were immediately rented out once completed, whereas at Kv. Loen which was state-owned, every floor is to be rented once fully completed. This caused differences regarding the logistical conditions considering materials, deliveries, accessibility etc. (Interview 2012). By comparing the projects to each other, despite of the other differences, the production stage had substantial benefits of procuring a 3PL. At Pennfäktaren, based on the interviewee's own perceptions, subcontractors worked daily with their own material handling. Consequently, it affected the time put on value creation negatively, a process that was more efficient at Kv. Loen. Nonetheless, it is difficult to make an exact estimate of man hours lost since there was no investigation regarding the matter. The reason why a 3PL company was not procured for the project Pennfäktaren was because the subcontractors were already procured by the time the solution of a 3PL was considered. This would have led to expensive renegotiations which probably would have ended up causing Projektbyrån to pay for the logistical works twice (Interview 2012).

HAND OVER STAGE

Once the project is completed the production stage will enter the final stage of the life cycle, which is the hand over stage. During the hand over stage where the organizations involved should evaluate the project to see what has been positive and negative and how it has contributed to the project success. A type of "Lessons learned" document has no exceptional motive of being any different to what would have been done previously. Yet, due to the fact that the procurement of a third party logistics company for Kv. Loen can be considered as a pilot project for this type of partnership, an added chapter in the Lessons learned with emphasis put on the subject regarding for instance its procurement, collaboration, results etc. will most likely be executed (Interview 2012). The evaluation will have a significant impact on any future collaboration between the parties. As stated in the theory chapter above, client satisfaction plays a significant role when determining whether or not the project is a success. Therefore it is important to consider client satisfaction since a well-executed work reflects the possibility of receiving future contracts and referrals (Interview 2012).

In this case Svensk Bygglogistik AB has been in contact with the end client of Kv. Loen as well as received referrals to other companies who are interested in the concept of third party logistics due to their own problems at another project regarding the logistics (Interview 2012). This is a verification of the client satisfaction and that the executed work done by Svensk Bygglogistik AB is considered a success. Whether this type of partnership will be used in future projects is however not entirely based on the success rate and a satisfied client. It has to be suitable for the project prerequisites, theoretically feasible and have upper management that supports the
method and believes in it in order to be able to create incentives and commitment throughout the organization (Interview 2012).
DISCUSSION

For years people have alleged the construction industry of being too conservative and reluctant of change, that there is no interest of trying to implement something new into an industry that works “fine”. There might have been some truth to that claim but recently changes, methods and the desire to improve has begun to surface more and more. The industry is becoming more fast tracked and the companies involved has to try to focus on new implementations to stay ahead or at least keep up with the “best-in-class”. The quote “You can’t teach an old dog new tricks” is a quote that many could find appropriate regarding the construction industry. I would on the other hand say that those people are wrong. Working with the case study Kv. Loen in the master thesis, a project with a big budget and a pilot project for Projektbyråen regarding the procurement of a 3PL, with a staff where the average age is approximately 50-60 years, has proven the quote being wrong. The implementation of this new method has worked out good based on open-minded key staff members and the reactions by the subcontractors. Of course there exists aspects that could be improved but it still can be considered as a successful pilot project. I would say that it wasn’t the ingenuity of young staff members that was the reason behind this result, on the contrary the vast experience of seniors combined with upper management support that provided the implementation with stability and the knowhow of quick actions should anything go wrong, which is something that could prove difficult with a more inexperienced staff. The stable traditional ways combined with innovative thoughts and methods set a good framework of how these types of project collaborations should be handled. This is probably because logistics and the method Svensk Bygglogistik AB works are not that new. Construction logistics has long been an important factor to achieve orderliness and efficiency at the construction site. The key is to implement this new way of performing it, to procure a 3PL that handles and plans the logistics after regular working hours and to create a more logistical mindset in all of the actors from the start of the project.

Nevertheless, to develop these partnerships with the benchmarking process is quite useless if the results and experiences from the pilot project are not taken further. Benchmarking implies that you continuously go through the model and gradually improve the innovative process thereby enhancing the company business performance, not just upwards in the company but also downwards to the workforce at site. In order for new implementations to work, all participants must understand the benefits of it. Consequences of implementations are that they often cost more than the well tested old ones and a client or a board member might initially not see the benefits on a larger scale. At first the projects should put the demand of profit aside in order to establish a good generic framework. This is why I consider it is important to keep a holistic view which has been previously mentioned throughout the thesis and not to focus solely on initial figures and profits. Implementation takes time; the concept of benchmarking provides the company with a model of how to dispense time to create the business knowledge needed. In order to establish a framework for these types of collaborations it might be recommended to initially focus this type of procurement for projects with a CM organization due to the fact that it involves many actors where the 3PL can keep track of everything regarding logistics, materials etc. in order to minimize delivery collisions. Thereby a framework for CM organizations can
gradually be built and constantly be improved through benchmarking. The repetition through the Deming cycle, see Figure 1, also enables a company to discover mistakes that have occurred repeatedly, which is hard to discover if this stops at a pilot project. In addition, by focusing 3PL on CM at first will also keep the probable increased bid prices to a minimum since one advantage when having a CM organization is the ability to use competitive tendering which will keep the costs down since it is procured in small packages.

Problems lie however in the situation that it even if the whole project organization is aware of the benefits and possibilities with a new method that works. If it becomes difficult to get concrete facts in a monetary perspective, it could become difficult to convince upper management or clients to use this type of logistical solution. Therefore it is highly relevant to try to acquire more accurate numbers on exactly how much can be saved when enabling more value adding man-hours. At the moment the results are more overall holistic results that are difficult to use as a long term persuasive argument to why this type of solution is preferred.

An immediate risk of the case study was in fact the low possibility of breakthrough insights since this pilot project had more or less an internal benchmarking approach. The expected outcome is that you have a high level of collaboration and relevancy of the findings, however as mentioned with a low possibility of breakthroughs, see Table 3 Types of Benchmarking. Therefore it is not surprising that the results are somewhat indifferent. Because of it being internal benchmarking, the project team was on board with the new method and executed their job properly, although there was only need for few immediate changes in the procedures. Consequently, the suggested next step could be to step out of the comfort zone and try working more with few of the new approaches in Table 2 Business Characteristics, approaches such as Integration, Coordination, Inter-organizational collaboration, Comprehensive interactions and Interpreneurship. Suggestively to take on a Cooperative benchmarking approach and cooperate even more with a 3PL since benchmarking companies in the industry that are not competitors have a high possibility of breakthrough insights with medium collaboration and relevancy, see Table 3 Types of Benchmarking. Projektbyrå and Svensk Bygglogistik AB are within the same industry however not being direct competitors since Projektbyrå is a project management company that has at the moment very little logistical focus and Svensk Bygglogistik AB is a logistics company, thereby they would not invade on each other’s markets but still receive the benefits of a partnership. Nevertheless, this is something that requires an environment of trust and openness between the parties of a construction project, as stated in the theory. Kv. Loen has given the opportunity to both parties to establish mutual trust to each other. In order to improve both companies competitive position the adopted processes must be improved and developed further. The possibility to improve these types of projects and collaborations is worth looking into. One possibility is to incorporate Building Information Modeling (BIM) into 3PL procurement. For instance, a project with well-functioning BIM combined with a material management tool such as Lognet could significantly decrease delivery costs and material handling. In this case deliveries registered in Lognet can be calculated by BIM with the purpose to see if for example a delivery of gypsum board is enough to complete a room or if there is any surplus materials due to an overestimated order. If deliveries also have a RFID tag, it is easy to see where the delivery is supposed to be and which subcontractor it belongs to.
CONCLUSIONS

How has the collaboration with the procured third party logistics company (3PL) been conducted during the project life cycle?

Looking back at the collaboration with the third party logistic company during the project life cycle, attention should be made to key events and decisions of great influence during all project stages.

During the planning stage of the project it was critical that the prerequisites of the project were suitable in order for partnerships to be an optimal solution. Ideal conditions for a suitable partnership project vary between variables such as cost, time and complexity. Kv. Loen had a budget of 700 MKr, production time of 30 months and was a complex project in central Stockholm, all of which are within the recommended prerequisites when considering partnerships. The point of time that a 3PL joined the project was also considered by the actors to be at the appropriate moment to have enough time to plan the different logistical aspects in order to give the project optimal starting conditions.

Key events during the design & procurement stage, with high influence on the project outcome are mainly the time of procurement, clear specifications & send outs and financial feasibility. Kv. Loen is using a CM organization which gives the project advantages in competitive bidding and procuring as its specified. This implies that the competition between the different subcontractors drives the bids down, despite the 3PL procurement. An early procurement of Svensk Bygglogistik AB was a critical factor regarding the outcome, due to the fact that it allowed them early involvement as mentioned above and also because of the possibility to add the collaboration in the specifications to the rest of the subcontractors procured later in the project, to specify what type of roles and responsibilities this collaboration implies. This minimized the amount of conflicts and contra productive actors, which otherwise would have led to expensive contract renegotiations if not specified. The specifications have worked well overall; nevertheless this is an aspect that can be improved by being more detailed to eliminate uncooperative subcontractors, which was the case regarding a few of them.

The procurement of a 3PL has caused increased costs since it required a procurement of extra officials. Although, having a holistic and a long term perspective regarding the cost is necessary, since it in the end lowers production time and thereby reduces expensive production costs as well as other expenses such as the rent of the site establishment.

During the production stage of the project, firstly, it was imperative that the communication between the actors functions and is clear. If not the advantages of CM becomes disadvantages which also counteracts the benefits of partnerships. Throughout the project there have been
regular formal meetings ranging through the entire organization. The informal communication has been considered and has been adapted accordingly when observing the site offices. Even though it has been each subcontractor’s own responsibility to check, information send outs have been sent, such as packing instructions and delivery schedules to minimize misunderstandings. Summarizing the communication it has been well executed based on the acquired documents.

Secondly, by having the collaboration specified from the start created incentives and commitment to perform. By also comparing the projects Kv. Loen and Pennfäktaren, the work carried out by Svensk Bygglogistik AB was noticeable since the subcontractors didn’t need to work with material handling, which enabled more man-hours to be put on value creation. This was not the case of Pennfäktaren, a project without 3PL, where practically the subcontractors had to work on a daily basis with material handling.

The result regarding the hand over stage is difficult to state and elaborate since the project had not reached that particular stage when the case study was researched. It is however recommended, that in the stage in question, evaluate the entire process of the 3PL procurement and include it as its own chapter in a sort of “Lessons learned” document. Even if the results of the evaluation are good, it is not always a preferred method since it has to be feasible theoretically and have upper management support.

- How is it possible to develop and optimize the collaboration with a 3PL in order to achieve better results in the future and as a partnership and a benchmarking method?

In order to be able to continuously create new business knowledge for the company there are numerous actions and optimizations that can be done, both instant and future changes. This pilot project has firstly revealed a few instant changes regarding the specifications and information flow. In order to avoid misunderstandings regarding the recycling of waste and contra productive actors, the specifications need to be stricter. Strict procurement and role specifications are necessary to avoid the production problems that have occurred.

As a benchmarking method it has a lot of potential if the pilot project is taken further. As mentioned before repetition through benchmarking enables the company to more easily spot reoccurring mistakes in the various processes. At the moment this pilot project has been more or less internal benchmarking, where the benefits are as previously discussed high collaboration and relevancy with low breakthrough possibilities. The results of this master thesis support that theory, no breakthrough insights and improvements have been found. Therefore to further improve 3PL as a benchmarking method, an expansion of the collaboration between Projektbyrån and Svensk Bygglogistik AB is an option. Cooperative benchmarking with a non-competitor within the industry is a preferable next step. To perhaps allow the 3PL aid in the
subcontractors’ procurement specifications by setting individual demands to different subcontractors based on their experiences during the production.

To optimize the collaboration is to create generalizations in the processes, create standards of the optimal procedure. The main generalization from this study is that if 3PL procurement becomes an feasible option. The procurement has to be as early as possible and included in the rest of the specifications, if not, the project will automatically become more expensive due to renegotiations.

- What is the client perception and satisfaction of the executed work by the third party logistics company?

A key sign of a successful project is if the client perception and satisfaction of the executed work is noticeable. In this case Svensk Bygglogistik AB has two clients; both Projektbyrånn as well as the end client, each of them with their own perceptions of what is according to them considered well executed work. As mentioned in the analysis, Svensk Bygglogistik AB has received numerous referrals and had meetings with the end client as well as other interested companies, a fact well worth considering when evaluating the project. Officials both from Projektbyrånn and Svensk Bygglogistik AB stress the importance of a satisfied client, a statement that is also supported by theory. Worth mentioning is also that even though the success rate is high and the client is satisfied, to justify a procurement of a 3PL it also has to be theoretically feasible.

As defined earlier by Baker, Murphy and Fisher regarding project success in the theory (stated in Thal & Bedingfield 2010).

“If the project meets the technical performance specifications and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people in the parent organization, key people in the client organization, key people on the project team, and key users or clientele of the project effort, the project is considered an overall success. “

Considering that the procurement of the 3PL has led to efficient organizing of the site and delivery distribution in the planning stage as well as enabling the subcontractors more value adding man-hours during the production stage. It has consequently led to reduced production costs. Regardless the fact that the figures are holistic and are difficult to estimate, listening to the statements in the interviews and the referrals the company has received, it is reasonable to say that the clients in this case are satisfied with the executed work of Svensk Bygglogistik AB and can therefore be considered as an overall success.
FUTURE RESEARCH

This thesis is based on a case study conducted with delimitations mentioned in the introduction. An aspect that was not studied was the subcontractor’s point of view, what was according to them good/bad. For many of the subcontractor companies it has also been a pilot project regarding 3PL. To capture their opinions of how their daily work and routines have been in the matter can provide insights that can improve the processes regarding 3PL projects.

The thesis has had a holistic view of the financial profitability. Further research regarding profitability of 3PL procurement is recommended in order to in the future achieve a generalization of how much of the cost and project duration can be reduced.


LOU Lag om offentlig upphandling, SFS 2007:1091, WWW.LAGEN.NU.


Projektbyrån 2012, WWW.PROJEKTBYRAN.SE, viewed 27/2 2012.


Thal, AE & Bedingfield, JD 2010, 'Successful project managers: an exploratory study into the impact of personality', *Technology Analysis & Strategic Management*, vol. 22, no. 2, pp. 243-59.


INTERVIEWS

Interview 2012, Projektbyrån (3p)/Svensk Bygglogistik AB (1p).
APPENDIX A - ANBUDSFÖRFRÅGAN

Projekt
12522-000 Kv Loen, Stockholm

ANBUDSFÖRFRÅGAN DE 91-9 Logistikserviceentreprenad

Med hänsyn till bifogat och nedan förtecknat förfrågningsunderlag erbjuder vi Er att lämna anbud på utförande av rubricerade entreprenad.

Omfattning och förutsättningar

Entreprenad avseende logistikservicearbeten skall ingå enligt bilagd omfattningsbeskrivning. Logistikentreprenören skall svara för mottagning och intransport av entreprenörens installations- och inbyggnadsmaterial. Beställaren kommer handla upp utförandeentreprenader entreprenadvis som delade entreprenader ca 50 st. De flesta av dem avser vi skall utnyttja logistikentreprenören för mottagning och intransporter av sitt material.

Beställaren tillhandahåller 2 st bygghissar med hissbygggor och intertrappor samt intagsbygggor till 9 st stannplan på Jakobsgatan mitt för gamla huvudentrén på Jakobsgatan samt en liten bod för mottagningskontrollant. Beställaren ombesörjer även inplankning av lossningszon för godsomtäckning med bommar och skjutgrinder. 1 st portalkran med 56 eller 60 m räckvidd (radie) kommer att stå på Karduansmakargatan och denna kan användas för speciella lyft men i huvudsak skall intransporterna utföras med bygghissarna.

Orienterande beskrivning

Kv Loen är idag i behov av renovering för att uppnå moderna funktionella arbetsplatser.

Fastigheten kv Loen skall genomgå en total renovering och en del av fastigheten kommer att byggas på med 3 våningsplan.

Projektet omfattar en ombyggnad av ca 25 000 m² bruttoarea (BTA) samt en påbyggnad i 3 plan om ca 3 500 m² (BTA).

Se nedanstående handlingar och förtecknat förfrågningsunderlag.

Förfrågningsunderlag

Denna anbudsförfrågan, som vid eventuellt förekommande motstridigheter gäller före övriga handlingar, samt nedan enligt AB 04 kap 1 § 3 förtecknade handlinger

3 AB 04 med de ändringar och tillägg som framgår av denna anbudsförfrågan och av AF enligt 06.1 nedan

9 Administrativa föreskrifter (2 sidor) dat. 2009-02-22
11 Beskrivningar
   .1 Omfattningsbeskrivning DE 91-9 Logistikentreprenad (2 sidor) dat. 2009-06-02

12 Ritningar
   .1 A-40-0-1100 dat. 2009-04-17
   .2 A-40-1-020 dat. 2009-04-17
   .3 A-40-1-030 dat. 2009-04-17
   .4 A-40-1-040 dat. 2009-04-17
   .5 A-40-1-050 dat. 2009-04-17
   .6 A-40-1-060 dat. 2009-04-17
   .7 A-40-1-070 dat. 2009-04-17
   .8 A-40-1-080 dat. 2009-04-17
   .9 A-40-1-090 dat. 2009-04-17
   .10 A-40-1-100 dat. 2009-04-17
   .11 A-40-1-110 dat. 2009-04-17
   .12 A-40-1-120 dat. 2009-04-17
   .13 A-40-1-130 dat. 2009-04-17
   .14 A-40-2-030 inritad sek tion för 2 st bygghissar etapp 1 resp etapp 2 dat. 2009-04-17

13 Övriga handlingar
   .1 Formulär till anbud (skall inskickas komplett ifylld med bilagor) dat. 2009-06-02
   .2 Arbetsmiljöplan upprättad av Projektbyråns rev. 2009-03-10
   .3 Generella kvalitets- o miljökriterier för entreprenörer(Insändes ifylld) dat. 2006-10-20

Tider
Start beräknas att påbörjas 2009-09-01 med logistikplanering under det 1: a halvåret inför produktionsstarten i början av 2010.
Projektets totala byggtid är från och med 2009-09-01 beräknas avslutat till 2011-09-01.
Förutsättning för ovanstående tider och avtal är att regeringen ger klartecknen för hela projektet under sommaren 2009.

Uphandlingsförarande
Förenklad förarande

Administrativa föreskrifter
Enligt gällande AF ovan med följande tillägg:
1. Beställaren tillhandahåller el och vatten från befintliga uttag.
2. Beställaren tillhandahåller plats i manskapspoddar med dusch och omkläder i kv. Loen på Karduansmakargatan, eller i källaren under etableringsstiden.
Övriga administrativa föreskrifter enligt bifogad AF dat 2009-02-22.

Prövning av anbudsgivare
Anbudsgivare kan komma att uteslutas från vidare deltagande i upphandlingen om något av kriterierna av krav i förrågningsunderlaget inte är uppfyllda.
Värderingsgrunder vid prövning av anbud

Det anbud som är det ekonomiskt mest fördelaktiga kommer att antas.
Följande kriterier, angivna i rangordning, kommer att ingå vid bedömningsen för antagande av anbud:

- referenser, pris, ålder på utrustning
- tid, utrustning, resurser och service
- projektororganisolation / kompetens och kapacitet att utföra logistikarbete inom tidsramarna (efter arbetstid)
- miljöpåverkan

Visning av arbetsområdet

Visning av arbetsområdet med besöksadress Jakobsgatan 26 sker efter överenskommelse med:
Productionsservice
Mobil: [redacted]

Anbud

Anbud skall vara uppställt och ifyllt enligt tillhandahållit formulär till anbud och följa förfrågningsunderlaget.

Anbud märks "ANBUD DE 91-9 Logistikserviceentreprenad Kv Loen" och sänds till:
Statens fastighetsverk
FO Regerings- och domstolsbyggnader
Box 2263
103 16 STOCKHOLM
Besöksadress: Jakobsgatan 6 (receptionen är öppen till kl 17.00).


Upplysnings

Frågor beträffande denna anbudsförfrågan skall ställas till: Produktionschef
Mobil: [redacted] eller inköpare: [redacted], Mobil: [redacted]

Eventuellt kommer antagen entreprenörs personal som skall arbeta på plats med entreprenaden att "säkerhetsgranskas" och godkännas av beställaren för att få arbeta med entreprenaden.

Om Ni är förhindrad att lämna anbud ber vi Er meddela detta snarast.

Med vänlig hälsning

E-mail: [redacted]
Mobil: [redacted]

Bifogas: En omgång av ovan förtecknat förfrågningsunderlag.
Omfattningsbeskrivning av DE 91:9 Logistikserviceentreprenad
kv Loen, Stockholm

Entreprenadomsättning med öppen redovisning av kostnader för bemanning samt nödvändig utrustning såsom hjälpmedel och truck.
Beställaren förbehåller sig rätten att handla vissa delar själv eller låta det ingå i annan entreprenad.

Entreprenaden omfattar en logistikansvarig tjänsteman, en mottagningskontrollant samt logistikservicearbetare. Antalet logistikservicearbetare varierar över tiden uteftre projektets behov.

1. Logistikansvarig (E=entreprenören)
- E säkerställer att logistikanalysen efterlevs genom hela bygghandiskosseten.
- E ansvarar för att logistikanalysen hålls kontinuerligt uppdaterad och anslagen på av beställaren anvisade platser.
- E lägger in alla leveranser och aktiviteter på projektet i ett eget och av beställaren godkänt leveransplaneringsystem. Detta system skall redovisas i anbud.
- E ansvarar för att leveransplaneringsystemet kommunikeras ut till samtliga entreprenörer och att de följer systemet.
- E ansvarar för att samtliga aktörer blir informerade om hur materialflödet och logistiken skall fungera på projektet innan de startar sitt arbete.
- E bistår entreprenörerna hur de skall informera sina leveranstörer om hur leveranserna skall ske till arbetsplatsen och upprättar APD-planer skedessvis under hela projektet.
- E medverkar på alla UE möten, och vid behov även på byggnäten.
- E håller arbetssedlar för Logistikservicearbetarna.
- E planerar in rätt resurser för intransporthandeln som utförs efter ordinarie arbetstid inkl. överlämnande och genomgång till ansvarige i logistikpatrullen.

2. Mottagningskontrollant (E=Entreprenören)
- E ansvarar och kontrollerar alla leveranser som kommer till bygget, med avseende på kvantitet (fritidsdel överensstämmer mot gods) och kvalitet (transportskador). Detta skall dokumenteras och redovisas för respektive mottagare.
- E ansvarar för fuktnäring av allt fuktintakt inbyggdsmaterial. Detta skall dokumenteras och redovisas för beställaren.
- E är ansvarig kontaktperson för alla leveranser, har emot förvisningar etc.
- E ser till att alla leveranser som kommer är inbäddade i leveransplaneringsystemet.
- E vidtar alla ankommande transporter om vart och hur de skall lossas.
- E ansvarar för att lossning av leveranser sker på ett effektivt och säkert sätt.
- E ser till att alla som kommer till bygget blir informerade om gällande rutiner.
- E ansvarar för att alla som är behöriga att besöka arbetsplatsen får tillgång till nödvändig skyddsutrustning och besökskort.
3. Logistikservicearbetare

- Logistikservicearbetarna skall ombestöja att allt planerat material / gods tas in på arbetsplatsen till alla entreprenörer.
- Logistikservicearbetarna skall främst jobba efter ordinarie arbetstid. Detta innebär att leveranser delvis måste styras till tider efter ordinarie arbetstid.
- E s logistikservicearbetare är den logistikansvariges förlängda arm ute på byggarbetsplatsen, antalet anpassas utifrån projektets framskridande.
- Dessa skall bistå E s mottagningskontrollant vid leveranser som trafikvakt etc.
- E skall arbeta aktivt med väderskydda av material på byggarbetsplatsen.
- E skall arbeta aktivt med att underlätta materialhanteringen för alla entreprenörer på projektet.
- E skall arbeta aktivt för att bistå skyddsombudet rörande arbetssäkerh.
- E skall svara för enkla presentation av logistikanalysen för besökar.
- E skall svara för förberedelser och iordningställande inför intranporter av material efter byggets ordinarie arbetstid.
- Eventuellt kan fler arbetsuppgifter åläggas E för logistikservicearbetarna under projektets framskridande.

4. Övriga resurser

- I entreprenaden skall de hjälpmedel anges i anbudet som är nödvändiga för att sköta den dagliga verksamheten med avseende på materialhantering.
- E skall bistå bygget med en 3 tons truck som skall vara stationerad på bygget dygnet runt under hela projektet. Trucken skall endast debiteras när den används. Minsta debitering är en halvtimme.
# APPENDIX C - PRODUKTIONSmöTE

## PRODUKTIONSmöTE-PRODUKTIONSledARE

**TID OCH PLATS:** 2012-03-01  
Klarafaret/Rötledgatan

**KALLADE:**

<table>
<thead>
<tr>
<th>N</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Produktionschef</td>
</tr>
<tr>
<td>X</td>
<td>Produktionsledare</td>
</tr>
<tr>
<td>X</td>
<td>Installationsledare W/S</td>
</tr>
<tr>
<td>X</td>
<td>Installationsledare E</td>
</tr>
<tr>
<td>X</td>
<td>Produktionsledare</td>
</tr>
<tr>
<td>X</td>
<td>Logistikansvarig</td>
</tr>
<tr>
<td>X</td>
<td>Arbetsmiljöansvarig, Bas U</td>
</tr>
</tbody>
</table>

**DELGES:** Samtliga i projektgruppen

**NÄSTA möTE:** 2012-03-15 kl 09.00-11.00  
Klarafaret/Rötledgatan  
Torsdagar utöver veckor kl. 09.00

**KOMMANDE möTEN:**

<table>
<thead>
<tr>
<th>PUNKT</th>
<th>PUNKTRUBRIK, FRAMFORD AV, PUNKTENS INHÅLL</th>
<th>ANSV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INFORMATION – ÖVERGRIPANDE FRÅGOR</td>
<td></td>
</tr>
</tbody>
</table>

Protokoll berör i huvudsak pågående produktion Hus 2.

Hustel 1 protokollför i en förankrad protokolldel kallad HUS 1 nedan.

### HUS 1

1. Sammanställning B: punkter utskickad av ÅG kommenteras av samtliga inför mötet fredag. Idag på mötet om SFV skulle deltaga, BS kollar med ÅG vad som gäller.
2. Möte klart, åtgärdandet av punkter pågår.
3. Arbeten med färdigställandet av LATS plan 3 pågår.

Lister från Eriksbergs glas säkras.

Ridsca dold bakom kexskäp.


5. Yttertak hus 1 rojs av
6. Endast trappa från terrass finns kvar, plockas ned av safecon under nästa vecka.
APPENDIX D - SAMORDNINGSMÖTE

SAMORDNINGSMÖTE HUS 2

**TID OCH PLATS**

2012-03-06, kl 10.00

**NÄRVARANDE:**

Platskontoret Rödbodgatan
Ohnegi Electro
BM Byggmentage
BM Byggmentage
Intercr
Lindqvist bygg
NVS sprinkler
Hålltagarna Borrtkniik
Sandbätiens Rör
SA-Interiör
Bygglogistik
Projektbyrån
Projektbyrån

**EJ NÄRVARANDE:**

ÖS Måleri
KSS
Fireprotection
Venair

**DELGES ÄVEN:**

SFV
Projektbyrån
Projektbyrån
Projektbyrån
Projektbyrån

**NÄSTA MÖTE:**

2012-03-13, kl 10.00

Platskontoret Rödbodgatan

<table>
<thead>
<tr>
<th>PUNKT</th>
<th>PUNKTNRUBRIK, FRÅGFÖRD AV, PUNKTENS INNEHÅLL</th>
<th>ANSV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FÖREGÅENDE PROTOKOLL</td>
<td>Info</td>
</tr>
<tr>
<td>6.1.1</td>
<td>Föregående protokoll utan anmärkning</td>
<td></td>
</tr>
</tbody>
</table>

P:\Statsens Fastighetsverk\Loen08 Protokoll\13 Produktionssmöten\Samordningsmöte atomkompletttering\Hus 2\Möte 6\Samordningsmöte Hus 2, nr 6.doc
APPENDIX E - FÖRPACKNINGSANVISNINGAR

Förpackningsanvisningar för Kv. Loen "hus 2"

Generella förutsättningar
Allt material som är våderskänsligt skall vara våderskyddat. År materialet känsligt skall det vara väl emballerat och kantskyddat!

Materialintransport till hus 2 sker via utvändig bygghiss.
För intransport via bygghiss och vidare genom fasadöppning gäller följande fysiska begränsningar:
P. S Det är i flera fall fasadöppningarna som sätter begränsningarna (inte bygghissen)!

Hus 2:
Material till plan 3 (källare)
- Samma som till plan 4.
- Materialet kan komma att handbäras ner via trappa.

Material till plan 4
- Godset får väga maximalt 1000 kg.
- Längden uppgår till maximalt 3000 mm.
- Bredden uppgår till maximalt 1200 mm
- Höjden uppgår till maximalt 1800 mm (inklusive pall)

Material till plan 5-8
- Godset får väga maximalt 1000 kg.
- Längden uppgår till maximalt 3000 mm.
- Bredden uppgår till maximalt 900 mm.
- Höjden uppgår till maximalt 1800 mm (inklusive pall).

Material till plan 9
- Godset får väga maximalt 1000 kg.
- Längden uppgår till maximalt 3000 mm.
- Maximal bredd och höjd se figur.
- En bredd på 900 mm ger en maxhöjd på 1500 mm (inklusive pall)

Går materialet inte in i bygghissen kan det bli aktuellt med kranbilslift. Detta måste meddelas minst 2 veckor innan leveransdatumet.

Vi förbehåller oss rätten att av säkerhets- och kvalitetsskäl inte transportera in material som ej är förpackat enligt dessa anvisningar. Denna bedömning görs alltid av vår personal på plats varför det kan bli aktuellt att avbryta ett planerat inlyft.
Fönsterpartier i karm

Metod:
Lossning sker med truck, intransport med pallyftare via bygghiss.

Anvisningar:

Fönster skall packas på EUR-pall för att:
- Bredden möjliggör transport via invändiga transportöppningar och standardöppningar för dörrkarmar.
- Höjden gör det möjligt att komma in i bygghissen samt i standardöppningar för dörrkarmar.

Övriga aspekter:
- Förpacka materialet på en EUR-pall som täcker hela godset, se bilden nedan.
- Förpacka materialet med väderskydd.
- Sträva fönster med skruv direkt i pallen.
- Förpacka materialet lägenhetsvis/planvis för att underlätta monterat.
- Märg godset tydligt.

Förtydliganden:

Bild 1
Dessa fönster är förpackade enligt spec.

Bild 2
Dessa fönster är Ej förpackade enligt spec.
Glaspartier utan karm

Metod:
Lossning sker med truck, intransport med pallyftare via bygghiss.

Anvisningar:

Glasskivor skall förpackas på stativ eller i lador enligt följande krav:
- Stativet skall vara längre än glasskivorna.
- Om glasskivorna är längre än stativet skall glaset skyddas ordentligt, i dessa fall lämnas inga garantier vid intransponen.

Förtydliganden:

![Bild 1](image1.png)
Glaset är längre än stativet.

![Bild 2](image2.png)
Glaset är längre än stativet.

![Bild 3](image3.png)
Kollit kan inte hanteras från kortsidan.

![Bild 4](image4.png)
Kollit kan inte hanteras från korsidan.

Svensk Byggeplastik AB
Malmohagen 14
433 33 Mölndal

Jan 2012
www.byggeplastik.se
031-807 850

49
Skåpssnickerier

Metod:
Lossning sker med truck, intransport med pallytare via bygghiss.

Anvisningar:

Skåpssnickerier skall packas på EUR-pall för att:
- Bredden möjliggör transport via invändiga transportöppningar och standardöppningar för dörrkarmar.
- Höjden gör det möjligt att komma in i bygghissen samt i standardöppningar för dörrkarmar.
- Obs. Högskäp kan förpackas separat då dessa måste hanteras för hand då höjden överstiger 1800mm.

Övriga aspekter:
- Förpacka materialet på en EUR-pall som täcker hela godset, se bilden nedan.
- Förpacka materialet med väderskydd.
- Förpacka materialet lägenhetsvis.
- Märk godset tydligt.

Förtydliganden:

Bild 1
Skåpsnickerier förpackade på EUR-pall.

Bild 2
Högskäp, separat förpackade.

Svensk Bygglogistik AB
Mersdöragen 14
433 33 Mölndal

Jan 2012
www.bygglogistik.se
031-807 450
Generellt om pallgods

Metod:
Lossning sker med truck, intransport med pallytare via bygghiss.

Övriga aspekter:
- Skydda känsligt material från kantstötter.
- Väderskyddat känsligt material.
- Märk godset tydligt.
- Förpacka materialet på en eller flera sammansatta EUR-pallar så att hela godset täcks.
- Förpacka materialet lägenhetvis/planvis/rumvis så att onödiga omflyttningar kan undvikas.

Förtydliganden:

![Image 1] Tegelpannor förpackade enligt spec.

![Image 2] Stenskivor förpackade i skyddande låda, denna låda skall placeras på EUR-pall.

![Image 3] Principförpackning av isolering.


![Image 5] Lecoblock förpackade enligt spec.

Svensk Byggnadsteknik AB
Motsilängen 14
433 33 Mölndal

Jan 2012
www.byggnadsteknik.se
031-807850

51
Skivmaterial såsom, gips, våtrumsskivor plyfa etc

Metod:
Lossning sker med truck, intransport med materialvagn via byggfliss. Materialet placeras på upplagsbockar.

Anvisningar:

Skivmaterial förpackas på följande vis för att:
• Bredden möjliggör transport via invändiga transportöppningar och standardöppningar för dörrkarlar.
• Höjden medför en bra arbetshöjd då materialet placeras på bocker.
• Skivmaterial skall av säkerhetsskäl inte förpackas på så kallad sjöpall.

Övriga aspekter:
• Förpacka skivmaterialen med väderskydd.
• Förpacka skivmaterialen med lösttagbara ströer.
• Märk godset tydligt.

Förtydliganden:

Bild 1
Gips placeras på upplagsbockar.

Bild 2
Plyfa placerat på upplagsbockar.

Svensk Bygglegistik AB
Mesohagen 14
433 33 Mölndal

Jan 2012
www.bygglegistik.se
031-807850
Virke och reglar av trä och stål

Metod:
Lossning sker med truck, intransport med materialvagn via bygghiss. Materialet placeras på upplagsbockar.

Anvisningar:

Reglar förpackas på följande vis för att:
- Bredden möjliggör transport via invändiga transportöppningar och standardöppningar för dörrkarmar.
- Bredden om 800 mm säkerställer också att reglarna inte trillar av bockarna då kollit bryts.
- Höjden medför en bra arbetshöjd då materialet placeras på bockar.
- Reglar av trä skall av säkerhetskäll förpackas med minst tre band.

Övriga aspekter:
- Förpacka skivmaterialet med våderskydd.
- Mark godset tydligt.

Förtydliganden:

Bild 1
Stålskenar placerade på upplagsbockar.
Långgods såsom rör och kabelstegar

Metod:
Kranbil från Jakobsgatan till hissbrygga. Tillstånd måste sökas minst 10 dagar innan leveransdag då gatan måste stängas av. Se till att i största mån INTE leverera gods som överstiger 3000 mm.

Anvisningar:

![Diagram](image)

Långgods förpackas på följande vis
- Godset får en vara längre än 6000 mm.
- Rör måste vara ordentligt buntade.
- Kortare material får ej vara dolda inuti buntarna (då dessa kan falla till marken då kollit bryts.)

Övriga aspekter:
- Märk godset tydligt.
**LOGISTIKARBETET I KVARTERET LOEN**

Logistikhanteringen står i fokus under ombyggnaden av kvarteret Loen. Syftet är att underlätta produktionen för projektets aktörer samt skapa en säker, ren och effektiv arbetsplats. I och med att installerare och andra yrkesgrupper slipper att transportera in sitt byggeomaterial får de mer tid över för värdeskapande arbete, vilket de är bäst på. När arbetet kommer till arbetsplatsen på morgonen kommer rätt material i rätt mängd att ställa upp på plats, och det är bara att sätta igång med arbetet. Eftersom all materialhantering sker på kvällstid kommer hissarna inte att ockuperas för bordsande materialhantering under dagtid vilket sparar mycket värdefull produktionstid.


Allt material skall också förpackas enligt inskriptionen i denna tabell (max vikt, längd, bredd, höjd, osv.). Alla transportfordon som inte lossas med kran och som saknar bakgolv utför måste ha möjlighet att lossas från högra sida, se bifogad APD-plan.

Alla entreprenörer i projektet kommer att genomgå en introduktion hos den logistikansvarige, då kommer de praktiska detaljerna i detta arbete att gågs genom ytterligare.

Har du några frågor trea inte på att vända dig till någon av nedenstående.

**Logistikansvarig:**

**Mottagningskontrollant:**

**Logistikservicearbeteare:**
**Entreprenörer**
- ansvarar själva för intrasport av av hjälpmedel och maskiner för egna arbeten
- meddelar logistikansvariga planerade leveranser i god tid
- OBS! Entreprenörer får inte losa/tä i eget gods utan speciellt överenskommenhet.

**Kostnad**
- kostnad för logistikarbetare fakturerar varje entreprenör månadvis enligt logistikleverantörens tidspecification
- kostnad för logistikarbetare är 395 kr/tim
- aktuelle leveranser som inplaneras senare än en vecka innan leverans kommer att debiteras en ”planeringsavgift” om 1000kr/leverans
- logistikentrepenarden håller med truck med kapacitet max 3 ton med truckförare till en kostnad av 740 kr/tim

Om du vill veta vad hanteringen kommer att kosta för ditt material kan vi göra en prognos utifrån dina kalkyleringar förutsatt att materialet förpackas enligt instruktionerna. Kontakta gärna projektets logistikansvarig, Patrik Lindgren, för mer information.

Så här gör du för att få ditt gods till rätt ställe så billigt som möjligt:

1. Se till att du har tidsslossning i dina leveransarval. Speditören skall även kunna erbjuda högerlossade bilar.
2. Skicka förpackningsanvisningarna till dina leverantörer.
3. Se till att godset blir ordentligt märkt (plan, num, etc.)
4. Boka in dina leveranser hos den logistikansvariga i god tid så att du får den leveransdag och tid du vill ha. OBS! Om ditt gods inte faller inom förpackningsanvisningarna skall detta också anmälas i samband med inbokning av leveransen.
FÖRPACKNINGSANVISNINGAR
Intransport via bygghiss - godshantering med pallyftare/materialvagn

Pallgods EUR-standard
- max bredd 800 mm
- max längd 1200 mm
- max höjd 1800 mm inkl. pall
- max vikt 900 kg

Pallgods längre än 1200 mm
- max bredd 800 mm (isolering 1200 mm)
- max längd 3000 mm
- max höjd 1800 mm inkl. pall
- max vikt 1000 kg

Buntar placerade på materialbäck
- max bredd 900 mm
- max längd 3000 mm
- max höjd 900 mm
- max vikt 1000 kg

FÖRPACKNINGSANVISNINGAR
Intransport via tornplan och plattform med pallyftare/materialvagn

Långpall - längre än 1200 mm
- max bredd 900 mm
- max längd 4000 mm
- max höjd 900 mm
- max vikt 1900 kg

Långpall (sprinklärror, elstegar m.m.) längre än 4000 mm
- max bredd 900 mm
- max längd 6000 mm
- max höjd 900 mm inkl. pall
- max vikt 1000 kg
### APPENDIX G - LEVERANSSCHEMA

**Vecka 11.12 - Leveransschema Kv.Loén**

<table>
<thead>
<tr>
<th>Plan 21</th>
<th>Måndag</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:40</td>
<td>08:00</td>
</tr>
<tr>
<td>10:40</td>
<td>11:00</td>
</tr>
<tr>
<td>12:40</td>
<td>12:30</td>
</tr>
<tr>
<td>13:40</td>
<td>12:30</td>
</tr>
<tr>
<td>13:40</td>
<td>12:30</td>
</tr>
<tr>
<td>15:00</td>
<td>12:30</td>
</tr>
<tr>
<td>15:00</td>
<td>12:30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plan 22</th>
<th>Tisdag</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:40</td>
<td>08:00</td>
</tr>
<tr>
<td>07:40</td>
<td>08:00</td>
</tr>
<tr>
<td>07:40</td>
<td>08:00</td>
</tr>
<tr>
<td>07:40</td>
<td>08:00</td>
</tr>
<tr>
<td>07:40</td>
<td>08:00</td>
</tr>
<tr>
<td>10:40</td>
<td>11:00</td>
</tr>
<tr>
<td>10:40</td>
<td>11:00</td>
</tr>
<tr>
<td>10:40</td>
<td>11:00</td>
</tr>
<tr>
<td>13:30</td>
<td>14:30</td>
</tr>
<tr>
<td>14:30</td>
<td>11:00</td>
</tr>
</tbody>
</table>

**Förklaringar:**
- **LEVERANSER**
- **ARBETEN**
- **INLYFT**
- **ÖVRIGT**
- **AVSTÄNDS VÄG**
## Valda 11.12 - Leveransschema Kv.Loen

### Måndag
- **06:00** 11:00 plattform på bekräfting
- **07:00** 08:00 Lev, Lindqvisst, två och tio par (plan 6, kvarn, cykelbrogare)
- **10:00** 11:00 mjuk gummig (ZON 2)
- **11:00** 11:00 Lev, Lindqvisst, två och tio par (plan 6, kvarn, cykelbrogare)
- **15:00** 15:30 Lev, Fasadhygien
- **15:30** 16:30 Lev, förrättning avfyllning (enhetstillsyn), plan 4 och 5
- **15:30** 16:00 Lev, Skinnskattemynd, stora fallfält (plan 4 och 6)

### Tisdag
- **06:00** 11:00 plattform på bekräfting
- **07:00** 16:00 mjuk gummig (ZON 1)
- **08:00** 09:00 säkerhetskontroll samtliga arbetsområden (plan 4 samt byggplats)
- **10:00** 11:00 mjuk gummig (ZON 2)
- **12:00** 12:30 säkerhetsinspektion för alla assisterande arbetsområden (plan 21: loddarna, Jakobsgatan 26)
- **13:30** 14:00 Lev, Lindqvisst, bygg., 1 II (ZON 1 Jakobsgatan 26)
- **15:00** 16:00 Hårdt land väggkronainformation, samtliga störh. A, E i nottagbolten (plan 21: loddarna)

### Fredag
- **06:00** 11:00 plattform på bekräfting
- **06:30** 06:40 Lev, Lindqvisst, försedd med flygsäckar (plan 3 och 4)

### Förklaringar:
- **LEVERANSER**
- **ARBETEN**
- **INLYFT**
- **ÖVRIGT**
- **AVSTÅNGD VÄG**