

Designing a design process for the Veemgebouw

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ADMS publicatie 18



designing a design process for the Veemgebouw

from the points of view of the Eindhoven Council and Credo
Project Developer

/ stan ackermans instituut,
centrum voor technologisch ontwerpen

Designing a design process for the Veemgebouw

From the points of view of the Eindhoven Council
and Credo Project Developer

ir. M. Hendrata
ir. S.J. Scheltens

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Architectural Design Management Systems
Stan Ackermans Instituut
Technische Universiteit Eindhoven

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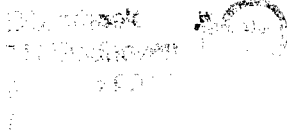
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Preface

Preceding their final nine-months' design project in practice, the Architectural Design Management Systems (ADMS) students do a three-months' real world case study in which they analyse and design a design process for a complex project. The main goal of this study is to integrate and apply their previously acquired analysing, process design and reporting skills. This report is the case study result of Martin Hendrata and Sander Scheltens who both belong to the fifth group of ADMS-students. The case study took place from September to December 2002.

Subject of this case study is the Veemgebouw in Eindhoven, part of the Park Strijp urban redevelopment scheme. For this old Philips warehouse a design team of DHV-AIB had made an imaginary concept design. Next the students were provided with imaginary clients in an imaginary financial setting. Martin and Sander are to be complimented for showing enough imagination themselves to treat this assignment as a real world project.

This report is in first instance meant for internal use. In it other students will find much and diverse material to use in other studies and to complement their own knowledge of design management. For readers outside the university the case itself may well be of interest too, as well as giving some insight in the scope of the ADMS education.

August 2003

Ir. Rik Schijf

Acknowledgements

This case study is a result of earlier contacts between ADMS and the design and engineering firm DHV-AIB in Eindhoven. We owe thanks to Mr. W. Klabbers and Mr. B. Wouters of DHV. They have provided us with an introduction in the project and comments on our work.

We would like to thank the interviewed participants for the time they made for us and the information they provided. These participants are:

- Mr. P. Jacobs of Credo Planontwikkeling;
- Mr. S. Ritzen of Bureau Ritzen;
- Mr. J. van Hooft of Eindhoven Council;
- Mrs. M. Willemse of Eindhoven Council;
- Mr. J. De Ruijter of Hurks;
- Mr. H. Krijger of En-en architects;
- Mr. T. Timmers of En-en architects;
- Mr. R. Urlings of En-en architects;
- Mr. R. Verhoeven of En-en architects.

Last but not least, we would like to thank Mr. R. Schijf, Mr. A. Kastelein, Mr. R. Daru and Mr. A. Den Otter for the organisation of the case study and their critical evaluations of the work.

Eindhoven, August 2003

Martin Hendrata

Sander Scheltens

Summary 1: from the Eindhoven Council's point of view

Municipal councils consider the image projected by its public buildings of paramount importance to the city. Such buildings can include listed and protected buildings that have to undergo changes of purpose, such as the Veemgebouw in the Park Strijp, Eindhoven. For this case study the earlier Eindhoven Town Hall renovation project was used as a point of reference to gain insight in the way the municipality approaches building projects. Two bottlenecks that occurred in the design process of the Town Hall were taken as learning experiences – (1) changes in decision-making and (2) budget overrun.

Changing decision-making within the Council slowed the progress of the design process and was an unpredictable factor that had an effect on both the Council and the architect. Changing political decisions also led to the architect working with an unclear assignment and lacking a proper brief at the beginning of the design process. Instead, in this period the architect should have worked on a time basis and according to the SR. However, engaging the architect on a time basis makes it difficult for the Council to control the design costs especially if there is likely to be an unstable decision-making process.

Using an alternative two stage tendering procedure can increase efficiency and avoid long bureaucratic procedures caused by having a large number of bidders. In the first stage, instead of using the specific criteria of price, other relevant and straightforward criteria can be used such as experience in similar projects and ISO quality standard accreditation to narrow down the number of bidders. In the second stage of the tender, more specific criteria can then be used to select the winner from the remaining bidders. Besides saving time analysing and selecting bids, by using this method, the Council could more easily select the type of bidder they prefer.

Finally in this study, we analysed En-en Architects, the architect of the Eindhoven Town Hall, to define the type of criteria required for the architect of the Veemgebouw. The essential criteria were characterised as reliability, expertise and professionalism and this led to a preference for a large, service-oriented firm with a matrix type organisation.

Summary 2: from the project developer's (Credo) point of view

An innovation group of DHV has developed a new function for the Veemgebouw, called the Speed Shopper. This report is as an advise for Credo, a project developer, to organize the first part of the process for realising the Speed Shopper. In order to design a design process for Credo, the project approach of Credo was investigated. This was done by analysing a reference project, which has resulted in some strong points and some improvement points in the approach of Credo. The analysis also resulted in three aspects which are used in designing the design process:

- Credo likes to run a project from close by;
- the yield of an investment is important;
- Credo prefers to work with parties with whom they have worked before (a good prior experience).

Designing a design process is planning and organizing the design process. Planning a design process is about what has to be done and when. It describes the process. Organising is who has to do what and describes the tasks and relations of the participating persons. This report addresses these two aspects. The main phases (including the activities) are identified and it is determined which parties have to be called in. The most important results/decisions are brought forward.

In the proposed design process DHV is called in for support during the initiative phase and the design definition phase. DHV develops their plan to the level of a sketch design. This involvement of DHV also respects the authorship rights of the plan.

The cost-benefit analysis is an important document for Credo during the design process. The decision to realise the plan of DHV must be based on this document. An important aspect to take into account is the possibility of a government subsidy. The Veemgebouw monument status and grants for restoration projects can be substantial.

Due to the involvement of DHV during the initiative and definition phase, there are two design phases; the preliminary and the final design phase. The parties are contracted during the preliminary design phase and a building team is formed.

The membership of the contractor in the building team is to have an early involvement of the contractor. After the final design phase, the contractor is contracted for a fixed price.

Because of this, there is price certainty for Credo early in the process. The contractor is responsible for making the working drawings.

Important in the process is the changing of the zoning scheme and the application for the permits (building permit, demolition permit and monument permit). Delays in these activities are harmful, because of an agreement with the purchaser of the Speed Shopper about the completion date.

On the basis of this process a suitable architect is selected. The selection criteria are (in order of importance):

1. experience with restoration projects;
2. profile and speed;
3. experience with Credo;
4. flexibility;
5. cost expertise and financial position;
6. size.

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Introduction

The purpose of this study is to design a design process for the reuse of the Veemgebouw in the Park Strijp, Eindhoven. To explore the design process, reference projects are analysed from two different types of client: a municipality and a project developer, respectively the Eindhoven City Council and Credo-Planontwikkeling. Two past projects, the renovation of Eindhoven Town Hall and the RIVA-building in s'Hertogenbosch, are used as references.

An assignment is given to the ADMS course members to design a design process for the realization of the Speed Shoppers, a 24-hours drive-in mall, in the building. This assignment applies for a project developer, but it does not fit within the Eindhoven Council' future plan for the Veemgebouw. That is why the first part of this rapport (Sections 2 up to 4) will focus on a design process according to the regulations as described in the Council' Master Plan and the zoning plan. The second part, which starts from section 5, will then focus on a design process for the Speed Shopper. The information about the plans for the Park Strijp and the Veemgebouw will be explained in Section 1.

Finally, the objective of both design processes is formulated as:

“To design two different design processes for the Veemgebouw, respectively from the points of view of the Eindhoven Council and Credo Planontwikkeling as clients, with the knowledge acquired from the analysis of Eindhoven Town Hall renovation.”

Subsequently, the design processes of Eindhoven Town Hall and RIVA-building are analysed from six managerial aspects, which are organization, information, cost, time, quality and risk. The analyses can be found in Section 2 and Section 6 respectively. An analysis of the related architect or design office follows each process-analysis. This refers to En-en Architects (architect of the Eindhoven Town Hall) in Section 3 and Ritzen Architecture (architect of the RIVA-building) in Section 7. Each analysis is completed with the author's conclusion. The second part of the report starts with the definition of project development (Section 5).

In Section 4 and 8, the two different design processes are both designed according to the project stages from initial up to the tendering and the granting of the building permit. A design office is developed that fits the proposed design process from section 8.

1 The Veemgebouw

The Veemgebouw, one of the buildings in the Park Strijp in Eindhoven, is protected by the law as a monument.



It was built in 1942 and its architecture was typical of the whole area (dark-brown brick facades with white stone strips) at that time. Mr. J.R. Bouten, the department director of Philips Technical Company, was the architect.

In the following sub-sections, the planned realization of the Park Strijp and a future plan for the Veemgebouw will be described.

Figure 1.1 The Veemgebouw

1.1 The Park Strijp in Eindhoven

The Park Strijp belongs to the Eindhoven municipality. According to the city vision plan (Stadsvisie 2010) (1), this area forms part of the upgrading plan for the Eindhoven city. The Stadsvisie 2010 sets out the ambitions which are used as the guidelines for the city development. In this plan, the quality of housing, work and living environment are considered good. However, the city still misses a certain power of attraction. As formulated in the Master Plan, the Park Strijp should establish the urban standard to such an extent that it suits the economic potential and the international character of the industrial community in the region.

Besides the intention to locate offices in this quarter, other types of facilities are also considered important, such as food and entertainment and sport and well being. However, it is emphasised that Park Strijp is not supposed to distract attention from Eindhoven city centre. To concentrate public facilities in the surroundings of the “Hoge Rug” of Park Strijp is considered the best option to minimise the complexity of the Master Plan. This consideration has influenced the parking facilities, which are expected to cluster in this location.

The first building activities and the completion of the Park Strijp are planned in 2006 and 2017 respectively.

1.2 The plan(s) for the Veemgebouw

At the moment, the Veemgebouw is used as a storage building for Philips. Several floors are used as offices, while the top-floor remains empty. According to the Master Plan, the Veemgebouw is suitable as parking garages and public facilities. For the public facilities there are a number of variants. In this assignment there are two different plans. From the point of view of the Council we assume it has been decided to locate a restaurant and a health and beauty centre on the top-floor(s) and a supermarket on the ground floor. The rest of the building is intended for parking garages. The Master Plan aims to establish maximum built-parking facilities to minimise street parking in the Park Strijp.

From the point of view of view of Credo it is assumed that to locate the Speed Shopper, a drive-in shopping center, in the building is an attractive option. An innovation group of DHV had developed this new function for the Veemgebouw (Brock et al, 2002).

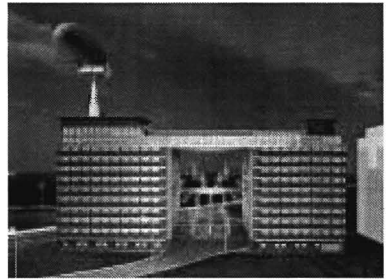


Figure 1.2 The Speed Shopper

Part I

Ir. M. Hendrata

2 The analysis of a design process: the renovation of Eindhoven Town Hall

Management of a design process should be based on six aspects: organization, information, cost, time, quality and risk. To establish how to integrate all of these aspects, what the restrictions are and how they should be managed in a building project, a well-known and successful project has been taken as a reference: the renovation of the Eindhoven Town Hall.

2.1 The renovation of Eindhoven Town Hall

Before going further into the management side of the design process, it might be useful to know what motivated the decision to renovate the Town Hall in the first place:

- The dull atmosphere and appearance of the building.
- The Eindhoven Municipal Council's goal was to become the leading industrial city of the South, which included having a high quality of architecture, especially from its public buildings. This building was no longer in keeping with this goal.
- The building was becoming obsolete: the building services were 28 years old and needed to be updated.

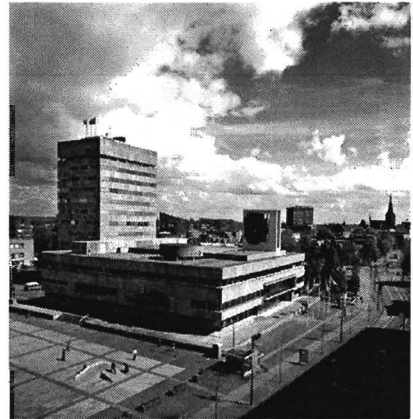


Figure 2.1 Eindhoven Town Hall

The purposes of the renovation are written in the Brief (February 11th, 1999):

1. Technical upgrading.
The technical installation was to be revised or changed, in line to recent Arbo (Occupational Health and Safety Act) and Environment legislation.
2. Functional improvements.
The relocation of the public departments lead to suggestions for functional improvements and new possibilities for using the rooms. By improving the functionality, the Eindhoven Municipal Council (from this point named as: the Council) tried to give a more people-friendly character to the building.

3. Quality improvements.

Functional improvements lead to quality improvements. Several design concepts were suggested to update the building's interior and use, such as:

- opening up the roof construction to achieve the idea of an open atmosphere;
- installing new elevators and stairs for a better access to different levels of the building;
- moving the restaurant to the ground floor for a better public use and modernising the restaurant's interior;
- restoring the exterior.

2.2 Organization

Throughout the initial, scheme and preliminary design stages, the main collaboration was between the Council and En-en Architects. En-en Architects, the project's architect, was a natural choice for the renovation. The historical bond with Mr. Thomassen, who was one of the founders of En-en Architects, was the main reason why this design office was selected. Mr. Thomassen was assistant designer and site manager of the original building in the late 1960s.

After those stages an external project leader was engaged to manage the project and the organizational structure changed. This started from the final design stage, up to the granting of the building permit. A project team was formed throughout this period. The Steering Committee formed by the Council, headed this team. After the granting of the building permit, this project team was replaced by the building team.

2.2.1 Project organization before the permit was granted

Throughout three stages (final design, building specifications and tendering), the Steering Committee appointed a project team to prepare the design and the tendering procedure. The external project leader chaired the team consisting of En-en Architects, the BBV (building supervision, management and permits department), the DBO (building maintenance department) and the BZC (Administration and Control), as described in figure 2.2. The Steering Committee was chaired by a Project Councillor, who was appointed by the City Councillors. The BBV department, an internal organization within the municipality, was engaged because of their experience in supervising building works. They also had experience in deciding when and which consultant should be engaged. Three parties from this organization were involved, namely the director and two internal project leaders. The director of the BBV department was the formal client and a member of the Steering Committee. The DBO is the administrative owner of the building. Their director was also one of the members of the committee. A technical expert in building maintenance from this service was added to the project team.

The external project leader from Van Sambeek Engineering Office, was the final member of the Steering Committee.

He reported the project's progress to the committee and executed the committee's decisions with the help of his project team's members. This party was engaged through a invited awarding procedure and was chosen from four other candidates based on the lowest bid.

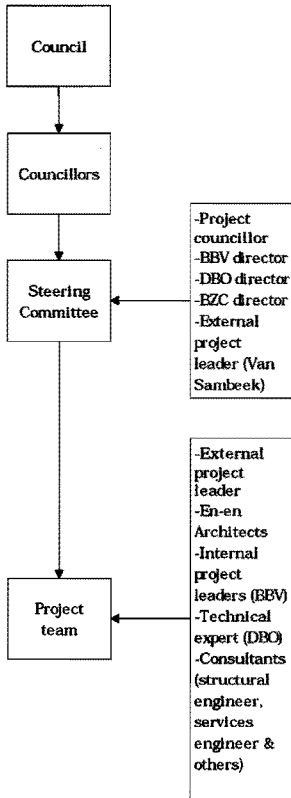


Figure 2.2 Project organization before the permit was granted

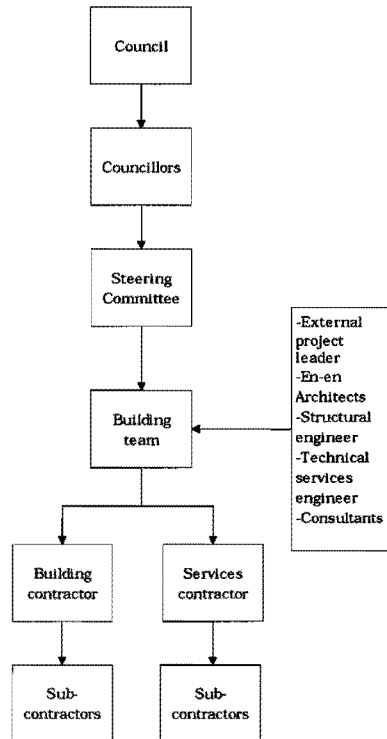


Figure 2.3 Project organization after the permit was granted

2.2.2 Project organization after the permit was granted

The building team replaced the project team during the building preparation and construction stages. Once again, the external project leader chaired the group consisting of En-en Architects, structural engineer, technical services engineer and other consultants. The external project leader was also appointed as a building supervisor, who took charge of the contractors and sub-contractors during the building construction.

2.2.3 Tendering

The tendering started directly after the building specification stage was finished. Traditional contracting was regarded as best for this project at the time because the Council considered an open market competition as essential for a low price. The contractor, HBG Utiliteitsbouw BV, was selected through an European tendering procedure. This selection was based on the lowest bid.

2.3 Information

The management aspect of information can be seen in two different contexts: in the decision-making context and the context of the designing parties. In the first context, the analysis is focussed on the decision-taking process between the Eindhoven Council and En-en Architects. The second context explains the way information about design and construction has been handled.

2.3.1 Decision taking

Changing political decisions within Eindhoven Municipal Council made the progress of the design difficult. The Council postponed the process several times, sometimes for a whole year, for many reasons. For example, when elections were approaching there was not enough time to concentrate on the project. As a consequence of this uncertainty, it took more than five years to finish the initial and preliminary design stages. This will be further explained in section 2.5.2.

2.3.2 Information exchange during the design process

The BBV department asked En-en Architects for assistance in formulating the brief during the initial stage. En-en Architects was also asked to make an inventory of the users' demands and expectations. Throughout the formulation of the brief and the making of scheme designs by En-en Architects, the project was postponed several times due to long waiting periods for decisions or even the changing (political) decisions within the municipality. These breaks caused many difficulties for En-en Architects in translating the assignment into a design. Eventually, the brief, which was completed and approved in February 1999, created a strong basis for the following works. The preliminary design was completed two months later.

The results of scheme and preliminary design stages were not evaluated by the Council. As a consequence, the information needed for the following stage was insufficient. This lack of information has contributed towards the difficulties of managing the design process.

In 1998, the BBV department assigned an external project leader from the Van Sambeek Engineering Office to check all plans on completeness and correctness before starting the final design. Besides functioning as a link between the Steering Committee and the project team, the external project leader also worked closely with internal project leaders from the BBV, who can provide most information about technical aspects of the building.

The external project leader made periodic reports to the Steering Committee. He used the services of Van Sambeek Engineering Office for specific know-how such as:

- National Building Codes-control, including building regulations control and EPN (Energy Performance Norms)-calculation,
- building physics controls,
- cost calculation,
- cost management and
- planning.

During the building construction, all members of the building team including the building and service contractors came together every month to attend building meetings that were organised by the external project leader. These meetings were organised to discuss the progress of the construction with the other parties, which included subjects such as planning, quality control, cost estimate, samples and contract variations. The results of these meetings were reported to every party. Therefore, the external project leader was able to monitor the progress and identify the problems as soon as they occurred.

2.4 Costs

The financial decision-making and management processes will be discussed in the next sub-sections. These two subjects will explain how important building realization costs are to the Eindhoven Council as client.

2.4.1 *The budget*

In the initial stage, when the Eindhoven Council still had to decide whether the renovation was necessary or not, a sum of € 8,2 million (18 million guilders) was mentioned in one of the meetings as a target. At that moment, nobody had a clear vision about what should happen with the Town Hall, let alone had defined a precise cost estimate for the renovation project. Therefore, this target was soon to be forgotten. A substantiated cost estimate followed several years later, when the preliminary design stage was almost completed. A financial consultant, Schreven, was commissioned by En-en Architects and produced a cost estimate of € 14,5 million (32 million guilders) for the project realization. Upon this estimate, the Council decided to enlist the Van Sambeek Engineering Office as project manager. The € 14,5 million cost estimate did not include interior design. On March 12th 2001, the Council decided to grant an extra credit of € 1,4 million (3 million guilders) for high value interior and the audiovisual infrastructure in the building.

2.4.2 *Cost management during the design process*

The external project leader was responsible for the cost management of the final design and building construction stages. As described in the previous sections, political decision-making had a strong influence on the design stages, especially for En-en Architects as the project architect.

Between 1993 and 1999, En-en Architects had produced various plans with different cost estimates, but the Council did not approve most of those plans. One problem is related to this issue. The uncertain political decision-making procedure made it difficult for En-en Architects to gain the necessary approvals when they were needed. It happened several times that En-en Architects expected a certain amount of work and engaged personnel, but then the project was postponed. However, the payment was proceeded according to the SR (standard conditions for architects). En-en Architects were paid for every plan they made. So they did not suffer a financial loss.

2.5 Time management

In the following sub-section, the project stages are described, in which the external project leader was contracted to take charge of the management. Before these stages, the project was difficult to manage. This subject will be discussed in section 2.5.2.

2.5.1 Planning

The Eindhoven Council gave the Van Sambeek Engineering Office the contract to manage the renovation project on October 5th 1998. The building activities had to be executed conform the project instruction, as confirmed by the Council. As a consequence, the previous plan had to be adjusted. The project instruction, formulated by the Council on July 10th 1998, gave an indication of how the renovation should be executed in terms of time. These instructions included:

- Project stage 1.
Plan development:
 - final design and building specification;
 - tendering;
 - building permit.
- Project stage 2.
Building preparation and construction:
 - contract;
 - building construction;
 - completion and occupation.

Subsequently, the external project leader made an overall plan for both stages. With this, he adjusted the previous plan, which was made by En-en Architects. According to the final Project Brief, the building construction stage (second project stage) was planned to start in 1999 and to be completed in 2000. In reality, the building construction was started in September 2000 and ended in November 2001.

2.5.2 Time management in practice

En-en Architects started the scheme design, at the request of the Eindhoven Council, in 1993. At the time, the design contract was not clearly finalised. Despite

this, En-en Architects continued to design until the official assignment was given in 1994. After several breaks, caused by changes in political decision-making, the preliminary design stage was finally finished in April 1999. Over the course of an almost six-years design period, the best design variant was gradually established.

After the preliminary design stage had been approved, the project continued in a faster pace. Within three years, the design was developed and the renovation was completed.

2.6 Quality control

The Eindhoven Council paid great attention to the technical aspects which support the architecture of the building. It is also important that these aspects contribute towards the user friendliness of the building, for example by opening the roof construction and adding artificial light to optimise the lighting in the building. Both external project leader and architect emphasise the product quality, in an attempt to upgrade the technical aspect and improve the functional aspect of the building. The BBV department controlled the project quality by enlisting specialists, such as En-en Architects to formulate the brief and Van Sambeek Engineering Office to coordinate the project.

2.6.1 Quality management

The technical upgrading and functional improvement of the building were the focal points for attention in this project. To achieve high technical and functional qualities, the Council organised an extended preliminary research focussed on both aspects in the initial stage. As a result, several technical subjects were analysed such as the ground condition, the water resistance of the concrete construction of the basement, the presence of asbestos and the effect of the glass roof construction on the indoor climate. A research concerning the glass roof construction was done in consultation with the structure and technical service engineers. Functional improvements have led for example to the removal of the doors in several compartments to meet the demands regarding the fire regulations.

2.7 Risk management

Risk analysis is essential to renovation projects. The chances that otherwise unexpected circumstances might arise during the process are greater than in new building projects. Hence, the preliminary research included technical inventories and feasibility studies.

2.7.1 Feasibility studies

The feasibility studies were focussed on two main subjects: technical and financial. The BBV department executed the technical study in collaboration with En-en Architects and the structural and technical service engineers.

The external project leader provided important contributions in making an inventory, analysis and assessment of the financial risks. Enlisting an external project leader was the most significant step that the Council took to minimise risks.

In hindsight, the early design procedures deserved more management. The fact that the decision-making process influenced the design process in such way, demands a better process management. If the Council had decided not to continue with the project, the architect would have had problems recovering his expenses (in 1993 up to 1994).

2.7.2 Building permits

The building permit was applied for, together with the environmental permit; both were granted without any difficulty. Even though the ground use and the building function remain the same, the interior has undergone major changes. That is why the new building has to meet building regulations such as:

- National Building Codes, which includes the Occupational Health and Safety Act and the fire regulations;
- Environmental law;
- Urban Development Plan.

2.8 Conclusion

Any relationship between a client and an architect should be based on trust. This trust factor was present during the project. However, changing political decision-making within the Council led to design inefficiency, which resulted in many design variants in the beginning. Working at their own risk and with a high degree of insecurity, not only discouraged the architect, but also made the design process difficult. The uncertainty for the architect with regard to his work capacity was great. The Council also took a financial risk when they asked the architect to continue with the work, considering that the project could be postponed in any time.



Figure 2.5 New interior of Eindhoven Town Hall

Political decision processes are always unpredictable. It can take months, or even years, before a decision is finally made. Formulating the risks, which can be divided into two points of view, might contribute to the solution of this problem. The risks can be described from the point of view of the client, such as the risk that the client might not be capable to formulate his demands and expectations. From the point of view of the architect, this implies that he may not be capable of acquiring sufficient design information from his client.

Both views concern the quality of the project design contract and the brief. The quality of these two documents determines the point of departure of the design process. The fact that the political decision-making has influenced the design progress makes it more complicated for both the Council and the architects to control the quality of these documents. To avoid design inefficiency, the architect might have refused to design without proper contract and brief. Both documents should be clearly defined first.

Retrospectively, enlisting an external project leader at the end of the initial design stage instead of in the middle of the preliminary design stage seems to have given a better solution. In this project, the transition from initiative to design stage was not even determined clearly, once again because of the changes in decisions. The external project leader's capability to manage the project in terms of time, cost and quality by co-ordinating his project and building teams, contributes to a better project management and to a smooth project course. Budget overrun arose in the beginning and during the late stadium of the project. Budget evaluations at the design stages which followed by adjustments to the brief, could contribute in remedying this issue in an earlier stadium.

3 The analysis of a design office: En-en Architects

En-en Architects is a medium-sized office with a thirteen men crew. This strong-service firm is specialized in several areas, such as feasibility studies, formulation of project briefs, quality control of existing buildings, building specification service (for a third party), building directory service (for a third party) and building maintenance service. The recent organization is a result of a merger in 1996 between two offices, Thomassen Architecten BNA BV and Vaessen Bureau voor Architectuur BV. Vaessen Bureau voor Architectuur BV, which only consisted of two architects, did not experience any major changes during and after the fusion. Both offices seemed to adjust perfectly to one another. Until June 2001, this architect office was known as Thomassen en Vaessen Architecten. After that, the name was changed into En-en Architects.

3.1 Strategy

Quality and continuity appear to be the number-one aim of the company. Besides improving design quality En-en Architects also has another ambition, which is to promote the long-range building maintenance plan. The purpose of this plan is to provide user-information to the client and the user(s) of the building and serve as feedback for their own designs. This user-information is provided in the shape of design manuals. At the moment, En-en Architects is still trying to convince its clients about the financial feasibility of this approach.

3.1.1 Organization plan of En-en Architects

Three directors, who lead En-en Architects, are the heart of the office. They also represent three different, sometimes overlapping, skills and backgrounds that complement each other. Twelve people, including the directors, are contracted on a permanent basis, the rest are trainees or stand-by workers. Before going any further in the decision-making process, it is essential to understand the distribution of tasks, responsibilities and authority within the office, which also describe the strategy of the company. The following diagram shows how the organization is structured. In the next two sub-sections, the decision-making procedure within the office will be described and the position of En-en Architects in the market will be explained.

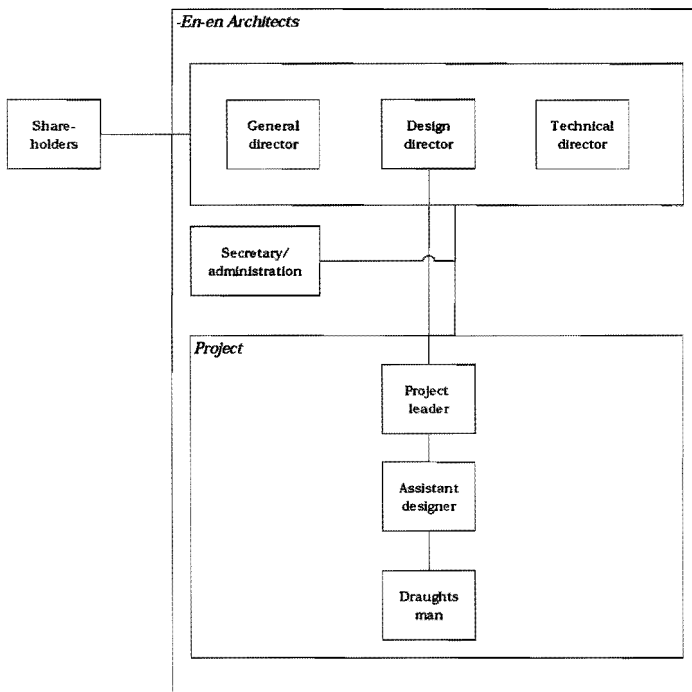


Figure 3.1 Organizational chart of En-en Architects

3.1.2 Allocation of tasks, responsibilities and authorities

En-en Architects is centrally managed and their working procedure is formalised. The three directors run the office with different styles, as explained in section 3.2. The general director is responsible for general management of the office. He also leads projects (in rotation with four other people, as described in figure 3.2), makes project plans and functions as one of the building specification writers. However, he does not participate in the design activities. The design director, on the other hand, takes charge of the design team and takes the end responsibility of the design. He can also be chosen as a project leader in rotation with others. The third director is the technical director of En-en Architects. His main responsibility is working out the technical part of the design. He is also responsible for managing the automation system, guiding the drawing team and leading projects in rotation with others. All three directors are ultimately responsible to the shareholders for profits made.

Three assistant designers, five draughtsmen and an interior designer, who is not attached on a daily basis, strengthen En-En Architects. The administrative specialist completes the structure. Assistant designers are responsible for parts of the design and project leadership. The latter is done in rotation with the directors. It differs from the definition of a project leader or a project manager in the building construction project, which defines a larger scale. Project leadership in an architect office is an internal position only.

Besides these main tasks and responsibilities, there are also several specific tasks, which are undertaken by specific employees or by one of the directors. These tasks and responsibilities are illustrated in the following matrix.

	General director	Design director	Technical director	Assistant designer 1	Assistant designer 2	Assistant designer 3	Draughtsman 1	Draughtsman 2	Draughtsman 3	Draughtsman 4	Draughtsman 5	Administrative specialist	Interior designer
General management	x												
Design management		x											
Technical anagement			x										
Project leadership	x	x	x	x	x								
Chef de bureau/office management			x										
Design		x	x	x	x	x							
System management			x										
Costing specialization			x	x									
Drawing							x	x	x	x	x		
Building-specification writing	x				x								
V&G-coordination	x												
Supervising							x						
Archive management											x		
Website management			x										
Office presentation management						x							
ARBO control					x			x					
Interior design													x
Documentation and samples management											x		
Building surveying			x										
Secretarial												x	
Administration												x	

Figure 3.2 Personnel-function matrix

3.1.3 Decision-making organization

The decision-making is formalised. Principally, the three directors take the decisions. However, opportunities are given to the employees to voice their ideas and opinions about the projects and the office management. Current projects are discussed during two weekly office-meetings. Large-scaled projects often need more attention, which is the reason why weekly meetings are occasionally organised. Management meetings, attended by the three directors, take place at the start of a project to discuss the strategy of the project.

The office is vertically divided into departments. The design director and the technical director sit on the highest floor. The second floor is for the assistant designers and draughtsmen, while the general director and the administrative specialist operate on the ground floor. Despite of these divisions, the communication between office members takes place in an informal atmosphere.

3.1.4 Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis

A SWOT analysis is essential to define the potential of a design office. Weaknesses is not applicable to En-en Architects. This design office has managed to address their weaknesses in order to meet the standards. Therefore, this aspect is termed as "learning opportunity".

The strong points of En-en Architects are their broad design orientation and high design quality. They have broad interests in many design subjects, from exterior finish to technical installations. In this case, it is important to have the necessary skills and knowledge in house. External specialists are often enlisted to give professional, mostly technical advice in large-scaled projects. These specialists could be structural or services engineers or a contractor in case a Bouwteam collaboration form is chosen. However, for financial reasons clients do not always agree to recruit these consultants.

The learning opportunity related to En-en Architects' interests is to achieve a high quality design by working with specialists from the early design stage. The opportunity for En-en Architects would be in promoting a long-range building maintenance plan for the users of the buildings they have designed.

The threats will come initially from uncertain circumstances, such as changing political decision-making within Council.

3.2 Organization

7 S management tools can be used as a checklist to analyse the design process organisation. Each S-tool defines how adequate an organization is. 7 S management tools can be observed and analysed in the real office situation. These tools relate to strategy, structure, systems, skills, staff, style and shared values.

3.2.1 Application of 7 S management tools to the office

Strategy

The strategy of En-en Architects is internalised within the office organization. Meeting the clients' demands and expectations and formulating quality design solutions, are considered of paramount importance. This is confirmed by En-en Architects' ambition of promoting a long-range building maintenance plan.

Structure

As described earlier in the sections 3.1.2 and 3.1.3, En-en Architects have improved fixed patterns of action and communication within their organization. These tasks and authority' divisions, sometimes overlap each other because of the overlap of knowledge and skills. The fixed patterns describe the formal structure of En-en Architects.

Two of the three directors keep an eye on the market by joining certain activities. The general director is a member of an entrepreneurial club, while the design director gives lectures at the Design Academy. In general, the broad interests of the three directors make it possible to get in contact with different types of specialisation.

Systems

En-en Architects is not certified to ISO-norms. En-en Architects decided not to be certified because of the cost and difficulty of this certification procedure. Instead, they have made their own quality control system: Intranet. This system is derived from the conditions defined in NEN-ISO 9000. The Intranet procedure is only available on the internal network.

Internal design communication takes place with the help of the "office-copy". An office-copy is a drawing document, which is used to transfer information from one person to another. To prevent mistakes, there is only one copy for every design change. This design change is marked with red and will be adjusted immediately in the computer. In case the design is changed again, a new copy will be printed and the previous one will be thrown away. En-en Architects works mainly with the AutoCAD drawing system. External communication takes place via direct or telephone conversations with the client, supplier or other building participants. The fax machine is often used to send information.

It is not always effective to send AutoCAD-drawings by e-mail because not everybody understands how to use AutoCAD, which often consists of many drawing layers. Despite this En-en Architects has started to communicate more through e-mail.

The formal internal communication concerning the design progress takes place during two weekly office-meetings.

Skills

The three directors represent three skills in management, design and technical construction. During the annual office meeting, the chance is given to every employee to make a suggestion about the type of courses or training they might need and want to follow. This policy makes it possible for every employee to improve his or her skills, for example to control the design according to National Building Codes. Special technological advice is often needed in large-scaled projects; which is why an external specialist or consultant may be enlisted.

Staff

Despite the training policy, self-improvement is likely to be chosen as an option. Another policy is monthly-organised lectures, to update knowledge in architecture and building construction or to keep everybody informed about the latest design progress.

En-en Architects invites specialists or one of the office members to give this lecture. Examples of topics are: improvements in the field of roof covering, or thermal insulation.

Style

Style in 7-S management tools terms refers to the leadership style of the company manager. The design director, as one of the three directors, has a more bottom-up approach to his employees in contrast to the other directors. He emphasises the results, but does it in a considered way by constantly involving his design team in the process. The general director is the manager of the office who emphasises the financial side of the design process. He organises and plans all office activities and distributes activities to others. His approach is mainly top-down. The technical director has a "one-by-one" approach to his colleagues and subordinates, also a top-down approach. He discovers something and then delegates the development of the idea to others.

Shared values

Two aspects are essential to describe shared values within En-en Architects. The first aspect is related to working hours. Most members of the company work from 08.30 and 18.00. Working overtime does not happen often, approximately two or three times a year. The three directors do the most overtime. But in general, En-en Architects tries to manage their activities within office-hours.

Informal activities such as Friday office-drinks, are organised every two or three weeks. Another informal activity is an annual office trip, for example to visit their realised design project.

To describe the organizational culture, figure 3.3 demonstrates the group cohesion within the organization. Despite the formalised working structure, the communication follows an informal way.

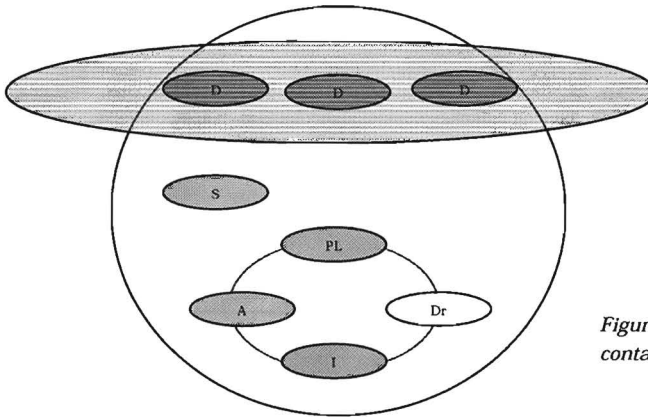



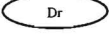




Figure 3.3 The organizational contact structure

-  : The directors
 -  : Project leader
 -  : Assistant designers
 -  : Draughtsmen
-  : Administrative specialist
 -  : Interior designer

3.3 Control

This part of the analysis emphasises the way a design project operates within En-en Architects, based on the 7 S checklist, as described in the previous sections. The operation starts with the definition of the type of assignment that En-en Architects does, which are:

Regular assignments:		95%
▪ Schools	25%	
▪ Offices	30%	
▪ Houses	40%	
Small scale projects		5%
Total:		100%

These percentages are averages which do not include services such as special consultancy. The latest type of assignment will be discussed in the following subsection.

3.3.1 Process course

En-en Architects divides the process streams in five stages, namely acquisition, contract, production, evaluation and documentation.

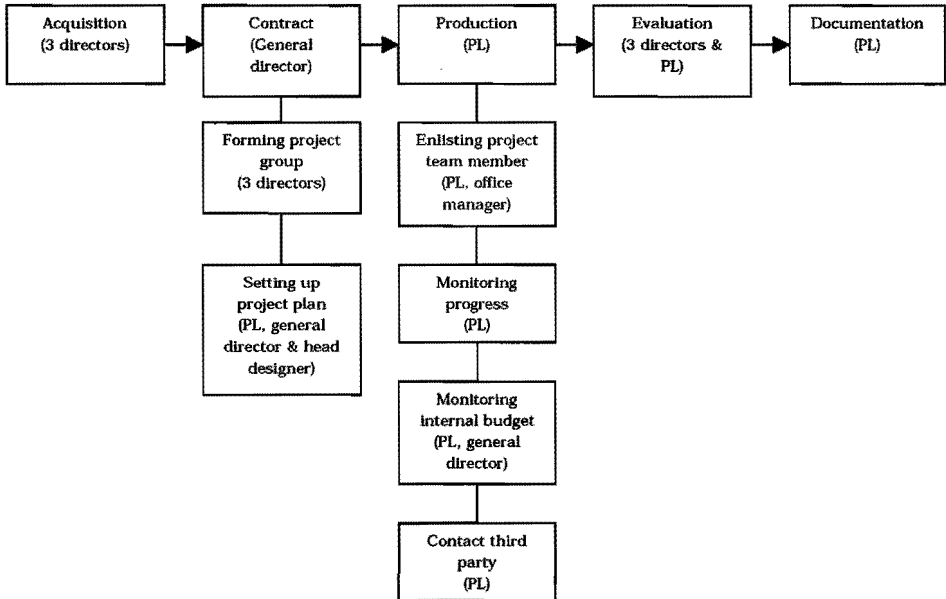


Figure 3.4 The process course chart

Acquisition

Depending on the order book, the acquisition proceeds in an active or a passive way. In the management meeting is decided which strategy to be followed.

Contract

Contract:

After an assignment is obtained, the general director will set up a contract and complete the contractual agreements with the client. This has to be completed before the design activities start.

Project group:

A project group is formed within En-en Architects. The directors form this group by appointing a project leader and an assistant designer.

Project plan:

To set up a contract, an inventory of all design activities has to be done. This is the responsibility of the appointed project leader, supported by the general director and the design director.

The result of this inventory will be a project plan, which contains the specification of all design activities that have to be executed within the project assignment, the members of the project group and the allocation of tasks to these members. In addition to the project plan, a time planning will also be made and handed in to the office manager.

Production

Intranet system:

As soon as the contract is completed the production process can be started. A complete description of the design activity procedure can be obtained in an internal system named Intranet.

Projects:

The tasks and responsibilities for one project can be different to another. The projects within En-en Architects are divided into three types; special consultancies, regular projects, and internal office management.

1. The assignments for special consultancies are given to the person who is qualified. Examples for these consultancies are supervising, writing building specifications and programming building maintenance. The special consultancies are contracted on an hourly basis, which have to be declared through the weekly hour-registration. The administrative specialist and the general director are responsible for this financial arrangement.
2. The management of the regular projects is more difficult. After the project plan is completed, the project leader will have to enlist the members of his group and allocate the tasks, in consultation with the office manager. The appointed project leader is also responsible for monitoring the progress of the design process. He is to consult cost or time changes in the planning with the general director and if necessary, the general director will have to report this to the other directors. Extra activities are only executed with the permission of the general director. Before that, the conditions of these activities have to be discussed with him first. In case extra activities are needed, the project leader has to determine, in consultation with the office manager, which person should work on this project. The project plan is used as a basis for this determination.
3. The directors and the office manager manage the office together. The office manager sets up, monitors and actualises the office plan, which is related to all project plans.

Evaluation

There are two types of evaluation within En-en Architects: the evaluation of the project and the evaluation of the office management.

1. Evaluation of the project.

An evaluation is organised after the project completion. Using project documentation as material, the project leader will discuss the completed project with the three directors. The purpose of this discussion is to learn from the last experience and use this knowledge for the following project.

2. Evaluation of the office management.

This type of evaluation is annually organised. Mostly in February or March. The purpose is to discuss actual issues concerning the management of the office.

Documentation

The project leader is responsible for the project documentation. He determines which material has to be documented and which material can be thrown away.

3.3.2 Informal organization; according to Mintzberg's Safari Schools

Ten Safari Schools (H. Mintzberg, B. Ahlstrand & J. Lampel, 2001) are used to describe how En-en Architects developed their strategy. The definition of these schools is explained in appendix 2. To find in which school En-en Architects can be categorized, a matrix containing 17 characteristics is developed as a checklist. These characteristics form the criteria used to determine the type of strategy.

The strategy development within En-en Architects is strongly oriented to the Planning School with an influence of the Design School. Both Planning and Design School have a prescriptive character; they emphasise how the strategies are supposed to be formulated. The Planning School considers strategy forming as a systematically organised process of a formal plan. The Design School on the other hand, believes that strategy forming is an informal process.

Several exceptions are derived from the matrix illustrated in appendix 2, such as the orientation of En-en Architects to the Entrepreneur School for having a no nonsense vision regarding the functional demands of the design work. They also aspire to improve their skills, which demonstrates the characteristic of the Learning School.

3.4 Conclusion

En-en Architects' formalised organizational system refers to stability and continuity. They have broad interests in many design disciplines and emphasise the quality of their work. The moment an expert, such as a building physics consultant, or a structural or services engineer, is engaged in the design process, he has a strong influence on the design. Working with these experts from an early design stage will contribute to a higher design quality.

Promoting a long-range building maintenance plan gives an excellent prospect for the future and feedback for own design. This approach still needs to be further elaborated to convince clients of the benefits of having an additional building-maintenance service offered by En-en Architects.

The changeable political decision-making within the Council demands preventive action such as making clear agreements with the municipality before starting the design activities, as described in section 2.8. However, in practice trust and financial arrangements are likely to be considered more important than having a water-tight contract first, before starting the assignment.

4 A design process for the Veemgebouw: from the Council's point of view

In the following paragraphs, the advice on the management of a design process for the Veemgebouw is divided into project stages. It starts with the initial stage and ends with the start of construction. The knowledge acquired from the analysis of Eindhoven Town Hall, is used as a reference to formulate the best design process for the Veemgebouw. The previous analysis of a design office also gives the criteria to determine the best-suited design office for this project.

4.1 Initial stage

Three basic conditions are valued as essential at the start of a project:

1. clearly defined project objectives;
2. analysed feasibilities of the project;
3. sufficient start information.

Before elaborating on these conditions, accordance within the Council should be established. The existing policies, such as the zoning plan and the Master plan for Park Strijp, are the points of departure for the change of purpose of the Veemgebouw. However, the Council still needs to gain majority support from the other members on the following decisions.

4.1.1 Sense of urgency and ambition level

Defining the sense of urgency of the renovation is a start. Therefore, the current condition of the building has to be analysed. The Council can engage a technical expert to execute this task. Before the ambition level of the plan is determined, the technical expert should hand in a report of his analysis to the Council. The report must contain an evaluation of the building performance according to the national building codes, which includes aspects such as energy performance and fire regulations. The expert's report is used as a basis to improve the functionality of Veemgebouw for the new use. After developing alternatives for the new use, which offer the information needed, the Council can define the sense of urgency of this project.

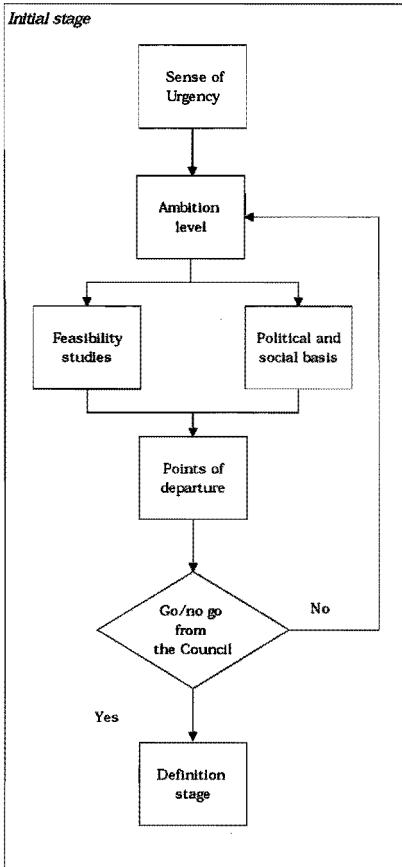


Figure 4.1 The activity chart of the initial stage

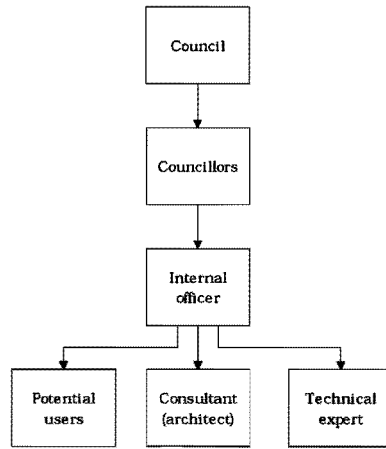


Figure 4.2 The organizational chart for the initial stage

The following step will be defining the ambition level of the Council. To achieve a complete picture about the demands and expectations for the new use of the Veemgebouw, the potential user(s) should be involved in the decision-making. A restaurant owner or a representative of the parking garage company can give detailed information about what they expect to have in the building. Their concerns must be respected and their advises will influence the following processes. The Council should appoint a special team to execute the first activities, consisting of the technical expert, potential building users, a consultant such as an architect (a design office) and a cost consultant. The selection procedure to select an architect should be started in this stage. This architect will execute the task as a design manager, which will be further explained in section 4.2.4.

Yet, the Council is obligated to achieve a permission from the original architect of the Veemgebouw, to renovate the building. This is essential regarding the copyright (the *auteursrecht*). If the Council would prefer to choose the same architect, they can apply the negotiated selection procedure without an announcement, instead of applying public or closed (*onderhands*) awarding procedures. This subject will be explained in section 4.2.

An internal officer will chair the team and he will be responsible for the formulation of the users' demands and expectations. The APZ department (General and Public Affairs) of the Eindhoven municipality, can be considered for this assignment. This internal organization is responsible for the maintenance of the municipality's buildings, including the Veemgebouw. However, if this internal officer is not available for executing the task an external consultant is a likely option.

4.1.2 Feasibility studies

The feasibility studies, to be executed by the internal officer's team, start by going deeper into the accommodation needs and technical feasibility of the new concepts. The basic performance criteria required for the Veemgebouw can be captured in three categories (Ten Dam, 1997):

1. functionality (flexibility, effectiveness, efficiency and creativity);
2. comfort (thermal comfort, air quality, visual comfort/light sources, acoustic comfort, vibration);
3. safety (calamity, user-friendliness, social safety, dependability, safety against burglary and hazardous material such as asbestos).

These criteria, in relation to the intended use, determine the building's quality. The specification of these criteria will be described in appendix 3. Besides the performance criteria, the image expectations are also considered important. These expectations comprise cultural value, identity of the users of the building and the public perception value expected from the design. Other aspects which demand attention are the financial and judicial feasibilities of the project. These aspects will be explained in the following sub-sections.

A restaurant and other potential purposes in the building such as a health and beauty centre and a supermarket, will demand more parking spaces. According to the Master Plan, street parking in the Park Strijp should be limited. It means that garage spaces should be provided to accommodate the cars. Part of this can take place in the Veemgebouw. This issue requires an analysis and should be included in the brief formulation.

Financial feasibility study

The primary goal of the financial feasibility study is to determine whether the renovation can be realised within the specified conditions, in general:

- quality demands, expectations and performance, all formulated in the brief;
- the financial scope, derived from the investment cost estimate.

The total annual fixed and variable exploitation costs determine the feasibility of the project. This is to be covered by the expected income such as rental to the users (restaurant, parking garage and health & beauty centre owners) and subsidies. The demands and expectations for the building have a major influence on the investment and exploitation costs. This 'value for money' relation is described in appendix 4.

4.1.3 Subsidy

The financial sources should be able to cover the project budget. One of the important potential financial sources is subsidies. The Ministry of OC & W (the Ministry of Education, Culture and Science) has a state-subsidy arrangement for renovated monuments. Another subsidy possibility comes from city-development funds. Besides their own capital and the subsidy, Council may also raise (additional) capital by contracting a bank loan VFOM, V&W

Only activity costs which are aimed to maintain the building's value can be subsidised (BRRM: the decree on state-subsidy for renovated monuments, 1997). To be considered for monument subsidy, the Council should prepare and approve a renovation plan and cost estimate for this project to get the Veemgebouw project accepted in the long-range program to the Ministry OC & W (Berg, van den, 2000; BRRM art.14). The Ministry will grant the subsidy within eight weeks after the application is received. Also, the Council is obliged to take out insurances, for example against fire, storm and lightning (article 27, BRRM).

The subsidy is paid in instalments, which may not yet have started during the renovation period. It means that the Council may have to pre-finance the project on their own expense. The National Restoration Funds (NRF), which comprises funds from institutional investors and banks, can provide this at a moderate interest. This foundation acts as a 'payment counter' for the subsidy. As soon as the subsidy is granted by the Ministry of OC & W (Article 20, BRRM), the NRF will pay an advance of the subsidy to the Council. In the definition stage, the Council will have to appoint a cost consultant to make a complete financial plan.

4.1.4 Risk analysis

The risk analysis should start in the initial stage and be actualised in the following stages. An expert (for instance the architect or design manager) specialised in executing risk analysis, should be appointed for this task. The risks which need attention in this early stage are:

- Insufficient insight about the future changes of the potential users' organizations. Therefore, a market analysis should be used as a foundation for the accommodation needs, a policy should be formulated to prepare the Council in changing user demands and sufficient flexibility should be built in for every spatial decision.
- Too ambitious budget. Ambitions should be clarified in advance and financial feasibility studies are indispensable in formulating the budget.

Also, a basic investment cost estimate should be made to be readjusted in the definition stage.

- Delay caused by the decision-making process of the authorities, for example if the monument permit was reserved. To minimise this risk, the information about application periods and the time constraints should be collected and considered in the time planning.
- Objections from stakeholders, such as the neighbouring community, which can cause delay during the application for the building permit.
- Delay or ending of or changes to the agreements by the stakeholders such as the building users. An inventory of the possible users should be made, as well as the policy for stakeholder management. In case suitable users for the restaurant and health and beauty centre cannot be found right away, the Council should engage a real-estate agent to search for possibilities in the market. Another alternative which is worth considering for the Council, is to prepare the carcass for the top-floors and let the users arrange their own interior the moment they decide to rent the place.
- With this, the Council can avoid the risk of designing a specific function such as a restaurant, when at the end no suitable tenant can be found for this function and the concept has to be changed for another type of public use.
- Unclear tasks, responsibilities and authorities. Making the organizational structure clear for every participant can prevent this lack of clarity. Basic meetings and information exchange structures should be defined to clarify these three aspects.

4.1.5 The monument permit

A monument permit is required for this renovation. Eindhoven Council has its own monument regulation and advice commission (the monument committee), and can grant the permit by itself. If a Council does not have its own monument regulation, they should send the application to the RDMZ, a sub-division of the Ministry OC & W, and let this party decide about the granting (Rijksdienst voor de Monumentenzorg, 2002). A complete description about the RDMZ will be given in appendix 5.

4.1.6 Neighbours

Eventually, it is also important to gain support from the stakeholders, such as the potential users and the neighbouring community. These parties, especially the neighbouring community, should be well informed in specially organised meetings to prevent objections. Meetings with these stakeholders can be organised after the definition and each design stage. The appointed project manager will be responsible for these actions. This subject will be discussed further in section 4.2.4.

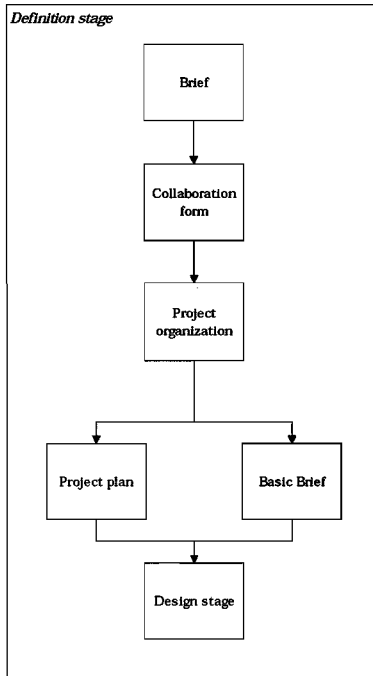
4.1.7 Stage plan and the Council' approval

A stage plan should be made by the internal officer, which consists of the results of feasibility studies and the volume method of cost estimates. This plan is the starting point for the definition stage and forms a complete document for the Council's approval.

If the Council decides not to give an approval for this project for financial or other reasons, the ambition level should be redefined and the feasibility studies should be reconsidered. If they approve the stage plan, the project budget can be fixed and the project can continue.

4.2 Definition stage

The (project) definition stage starts with the brief formulation. To formulate this document, an expert should be enlisted. Once again, it is possible that the same architect or design office takes this assignment under the category of other services, as described in appendices F up to K of the SR 1997.



The brief;

- serves as a mirror for the Council and the users. It contains an analysis of their demands and expectations;
- is a communication instrument; the architect's starting points to design the plan;
- is a contract instrument between the Council and the architect;
- is the basis of investment and exploitation cost estimates;
- is a checklist for the design.

The basic brief can be formulated from brainstorm sessions executed by the internal officer's team and the result of the feasibility studies. The Council should enlist an architect to make design sketches as part of the brief.

Figure 4.4 The activity chart of the definition stage

4.2.1 Project organization and the making of a project plan

Forming the project organization is the following step. The Steering Committee will be responsible for determining the project scope. Chaired by the project councillor, the Steering Committee consists of the internal officer, building users and appointed project manager. This Committee heads the Project Team, provides the project with resources and has responsibilities towards the Council. The project manager leads the Project Team and acts as a link between the Steering Committee and the Team. His main responsibilities regarding the Steering Committee include making reports about the project's progress, budget development and financial overview. He executes the decisions made by the Committee with the help of the Project Team.

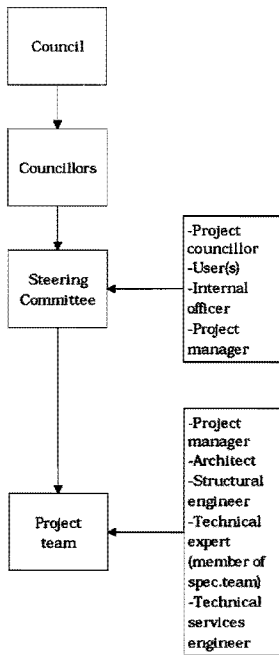


Figure 4.5 The organizational chart for the definition and design stages

Architect and other consultants (structural and service engineers) are contracted according to the agreements about the performance expected. The division of tasks, responsibilities and authorities should be clear for every participant and be part of their contracts. The organizational structure is illustrated in figure 4.5. 'Architect' in the project team indicates the design office, which includes a design manager and the architect himself.

4.2.2 Architect's contract and position

To prevent inefficiency which might be caused by the possible changing decisions from the Council, the architect will accept the assignment on the basis of the SR. The architect can decide to be paid on a time basis (article 79, SR 1997), which means that the architect's fee depends on the time that he and his employees spent on the project, for which an external hour rate has to be agreed. However, this type of payment makes it difficult to control the design costs. That is why the architect should be paid according to the percentage of the building costs as soon as the preliminary design starts.

From this point, the architect can also decide to take the full assignment or partly assignment. Full assignment includes all standard activities, as described in Chapter 12, SR 1997 and the building supervision activities. To select an architect, the Council is obliged to apply the European awarding procedure if the architect's fee is higher than € 249.681.

An architect or a design office which can offer special services such as formulating the brief and feasibility of the project, is a plus. Besides this aspect, other criteria are also considered important, such as:

- experience with similar projects;
- a demonstrable ability to work in a team;
- working procedure, guaranteed by ISO-norms or own quality norm (if so, which one) etc.

If the Council prefers to select a certain type of architect or design office, they should first organise a public selection according to the European procedure during the initial stage using the criteria above. From a possible large amount of candidates, a limited number (for example five) of architects or design offices can be selected. Subsequently, the Council can apply a closed (*onderhands*) awarding procedure with more specific criteria, to choose one of them.

These specific criteria usually concern the service quality and the price issues, such as a certain level of fee.

According to the SR (article 22), if the assignment is delayed or disturbed by the circumstances which the architect has not had any control of, the Council is obliged to make a financial compensation for the additional expenses made by architect on this reason. On the other hand, the architect is obliged to limit the additional expenses as results of these delay or disturbance. If the delay or disturbance has a long duration or puts the financial position of the architect in danger, this party has the right to end the contract.

4.2.3 Design manager

A design manager should be appointed to co-ordinate the design. Considering that the architect's main task, which is designing, should be executed with the minimum of disturbance, the co-ordination task should be done by a design manager. This party can be engaged from the same design office as the architect (for example an internal project leader) or from an external management office. In this report, it assumed that the design manager is employed at the same design office as the architect, which has an advantage because the design manager knows the firm very well. Therefore, he will have more control on the design process and the architect will have more trust in him, considering that the architect is familiar to the quality of his work as a process controller. The position of the design manager is described in figure 4.6.

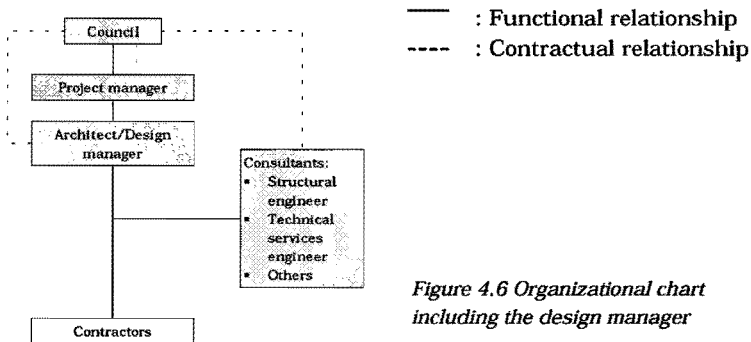


Figure 4.6 Organizational chart including the design manager

The Council should engage the design manager already in the initial and definition stages to execute the feasibility studies (together with the internal officer, the technical expert and the building users) and formulate the brief. Engaging a design manager adds to the value of the design process because this party has special skills in organization and information aspects. During the project organization, he will support the project manager in engaging consultants (design partners) and defining the information and communication structures. He formulates the selection criteria and makes suggestions about the consultants. After the project manager sets up the project organization, the design manager will draw up Work and Process Breakdown Structures (WBS and PBS). With these instruments, the tasks can be allocated to all design participants. Other responsibilities of the design

manager concern drawing up and implementing the information exchange procedures.

At random, the functions of the design manager are:

1. executing feasibility studies in collaboration with the internal officer, the technical expert and the building users;
2. formulating the brief under the supervision of the internal officer;
3. determining and managing the external project environment, together with the project manager;
4. supporting the project manager in organising the project;
5. phasing the design process;
6. managing the design team.

A detailed list of the tasks and responsibilities of both project and design managers is described in appendix 9.

4.2.4 Project Start Up

A Project Start Up (PSU) meeting should be organised after the collaboration form has been determined. Besides the members of the Steering Committee; the design manager, the architect, the technical expert and the (representatives of) building users will also attend the meeting. The PSU meeting has several purposes, such as:

- to establish agreement and understanding of the project content and the way it should be executed;
- to decide on the division of tasks, responsibilities and authorities and on the decision-making procedure;
- to discuss the character and the extent of the project, for example what the expected final product is;
- in which stages the project should be divided, how the project plan should be made and how the information exchange should be structured;
- to introduce the participants to each other.

As a result of the PSU meeting, every participant will know what to expect from each other. Often, this meeting will stimulate the team spirit.

An expert should be appointed to manage the project and to represent the Council in making decisions on technical and financial aspects of the project in the following stages. That is why a project manager should be engaged by following the same award procedure as the architect. The presence of this party in the PSU meeting is considered of paramount importance.

4.2.5 Project plan

The project plan contains:

- the risk inventory and the formulation of the risk actualisation method;
- the overall time planning (including the allocation of tasks and resources);

- the information exchange during the design and construction, which includes the meeting structure. The meeting structure describes the types of meetings (Steering Committee, Project Team), participants, meeting frequency, chairman and the party that is responsible for drafting the report. An example of this document will be illustrated in appendix 6;
- the cost-estimate control for every stage.

The following activity after making a project plan is formulating a stage plan consisting of the basic brief. Besides spatial demands and expectations, the basic brief also provides the financial conditions, time constraints, maximum energy-use, maintenance and exploitation conditions, and labour circumstances on the building site.

For time constraints, the total duration of design and construction should be fixed in the basic brief. This includes the completion and the occupation date. During the design evaluations, the time constraints can be monitored by defining milestones.

4.2.6 Cost estimate and the basic brief formulation

The financial aspect in this stage focusses on the financial consequences caused by the specified demands and expectations as described in the basic brief. This can lead to a revision of the cost estimate made in the previous stage. The limits for investment and exploitation costs should be determined in this stage and form the starting points for the following activities.

The Council should engage a cost accountant to draw up a detailed cost estimate, which can be used as a checklist in further stages. On the basis of this cost estimate, a time estimate can be made and planned. This plan is essential to establish the interest cost, price-increases and the building site cost. The building site cost forms a basis for the construction method and risks.

Type of brief

A multiple brief is a brief that is developed in different stages (Demmers D., 1999). Every version of the brief provides the input for the following (design) stage. This type of brief makes a controlled process possible. It is possible to adjust the basic brief after each design stage is finished. However, changes are only permitted during the evaluations, as described in figure 4.8. Those changes take place after agreements between the project team and the Steering Committee.

A multiple brief gives the building users the opportunity to follow up on the design, which can decrease the risk of not achieving their requirements. Another advantage is the possibility to check the process in terms of costs and time.

4.2.7 Field of force

An analysis of the building 'actors' should be made to determine the power and interest of each party in this project. The field of force analysis can be used for this purpose.

This analysis indicates possible oppositions that can influence the continuity of the project. Four segments are illustrated in figure 4.7 to describe the field of force between the building participants. Both building users and neighbouring community can oppose to the project realization. These parties have to live with the project results. If the building does not meet their demands and expectations, the building users may consider not to rent the place from the Council. That is why their participation in the design process is considered very important. As described in the previous sections, the neighbouring community can delay the process by objecting to the realization of the project. Changing a negative attitude of the neighbouring community is mainly the responsibility of the project manager. The design manager supports him by clearing the information exchange between the design team, the building users and the neighbouring community. Both managers should keep the actors who have positive attitudes towards the project enthusiastic.

In figure 4.7, the scheme on the right describes the position of the building participants towards the project. The distance between the participants and the project determines the importance of their contributions to the project. The building users' position is strong because they are also the members of the Steering Committee. The neighbouring community has to be well informed about the project but needs not to be involved in the design process.

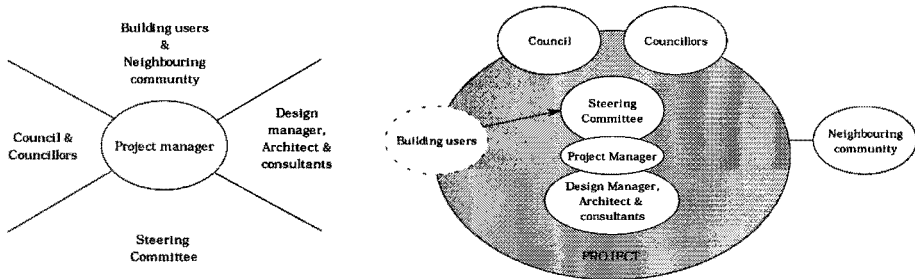


Figure 4.7 The field of force

4.3 Choice of collaboration form

A traditional collaboration form can be considered for the design process. The responsibilities and liabilities for design and construction are strictly separated in this collaboration form. Total say in the process is possible for the Council. If the Building Team collaboration form were chosen, the building contractor would participate from an early (design) stage. This collaboration form is not a profitable option for this project considering that the changes allowed in the Veemgebouw are from a smaller scale than for example, the changes required for the Speed Shopper concept from DHV-AIB, which has been mentioned in the introduction section.

The Speed Shopper concept demands major changes in the existing building structure and does not fit within the purposes as defined in the Master Plan and the zoning plan. As a result, its design process is more complex and the construction difficulty grade is higher. That is why for the Speed Shopper the contractor's participation in an early stage might be considered important. For our project, however, the construction issue can be resolved by engaging a structural engineer in the design stages to assist the architect.

Considering the Council's expectation to control the budget, it is important to organise the tender in competition by selecting the most advantageous economical bid. This subject will be further explained in section 4.6.

4.4 Preliminary design stage

The activities in the preliminary design stage comprise of developing a preliminary architectural plan for the redevelopment of the Veemgebouw including the definition of activities, structural, material as well as the financial aspects.

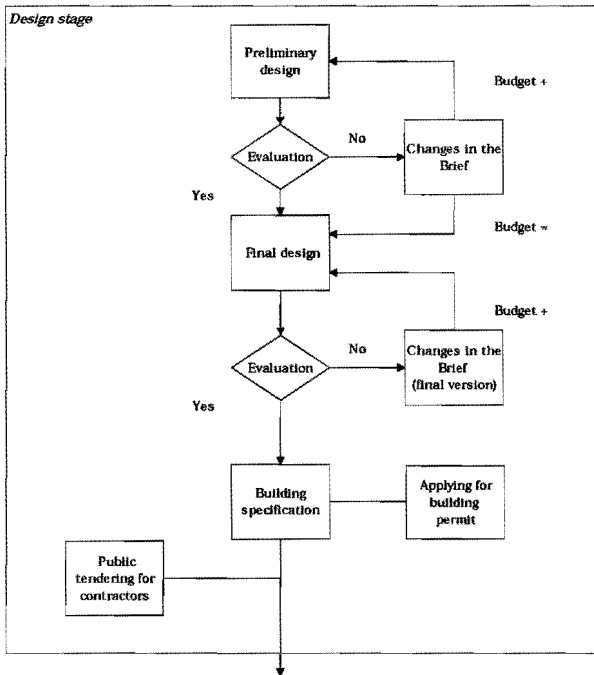


Figure 4.8 The activity chart of the preliminary design, final design, building specification and tendering stages

The design partners (structural and technical services engineers) will be selected using the criteria as described in appendix 7.

A list of aspects should be described in their contract, such as:

- project data;
- organization and meeting structure;
- extent of activities (according to RVOI);
- resources;
- legal status (rights according to the standard contract, such as RVOI 2001);
- types of fee (according to RVOI);
- declaration and payment;
- liabilities (according to RVOI);
- quality standard according to the project brief.

For the preliminary design stage, the same organizational structure is used, as described before in the definition stage.

4.4.1 Cost management in the preliminary design stage

The project manager should make a fee agreement based on the investment cost estimate from the definition stage. He can hold the architect responsible for the budget management by fixing a binding budget (*taakstellend* budget) in the contract. Communication between the project manager and the architect is essential to provide insight into the design's starting points and the related costs. After these agreements are made, the project manager should draft a budget book in which the architect's element budget is fixed.

The essential character of the preliminary design stage is that the amount of the building elements is known. Any cost deviation between the cost estimate formulated in the definition stage and the cost estimate derived from the preliminary plan, can be traced in this stage. If the cost estimate turns to be less than previously established (cost is lower than budget), both the project manager and the architect may have to adjust the budget in consultation with the Steering Committee or make reservations for unforeseen expenditures. If the previous cost estimate was exceeded more insights in the causes are needed. Such budget overrun may lead to adjustments in the design. After the decisions about adjustments are processed, a new budget can be fixed. If the cost estimate was not realistic, the budget should be adjusted. The cost monitoring during the preliminary design stage is described in the following diagram.

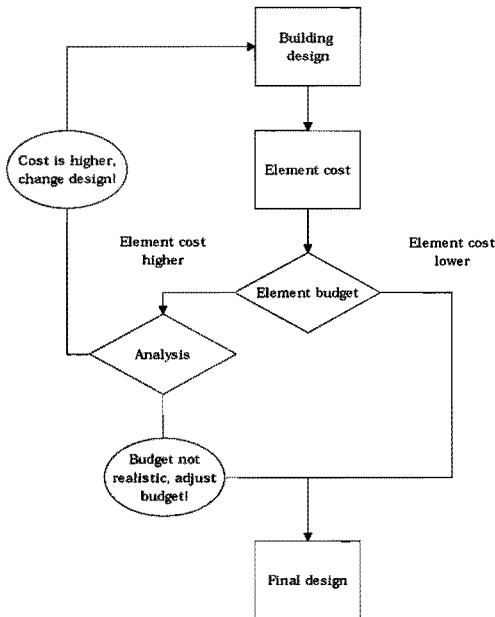


Figure 4.9 The cost monitoring during the preliminary design stage

The cost estimate made in the definition stage was based on a certain realization time and the time required for the design activities in particular. It is possible, for example, that the monument permit is delayed, which leads to pressure on the cash flow. Therefore, a cash flow check on the budget is essential. In the preliminary design stage, making a budget correction is still possible without major consequences in time.

4.4.2 Application for the monument permit

The application for the monument permit has to be filed to Council. The project manager can take this activity under his responsibility. Three months after the filing, Council will have to make a decision and announce this decision in writing to the applicant. If this time limit is exceeded, the permit will be automatically granted. An extension of maximum six months is possible, provided that there are proper causes according to Council. A building permit has to be refused if a permit pursuant to the Monument Law is required and this is not granted.

In case the monument permit is suspended, the suspension ends if:

- no appeal is made six weeks from the announcement of the suspension;
- an appeal is made, one day after the day the request for ending the suspension has been granted.

Council should make a decision about granting the building permit within two weeks after the suspension was ended. If the monument permit was granted but the decision regarding the building permit was not announced on time, then the building permit will be automatically granted.

4.5 Final design stage

In the final design stage, the preliminary design plan will be materialised. The drawings will consist of detailed plans and elevation drawings, sections, building installation schemes, construction details and material descriptions. By analysing alternatives for the choices made in the design, the best-suited detail solutions can be designed. Regarding quality, the (latest version of the) brief will remain as a starting point.

After the final design is finished, the application for the building permit and the first tendering procedure can be started.

4.5.1 Cost management in the final design stage

The cost aspect is fixed in the budget book and an actual financial plan. If the cost factor during the final design stage has met the demands and limitations as described in the budget book, financial plan and the brief, a go/no go decision should be made to continue to the next stage (building specification). The cost management during the preliminary and final design stages are summarised in the following scheme, based on the cost management theory written by Keyner and Rosmalen (2001).

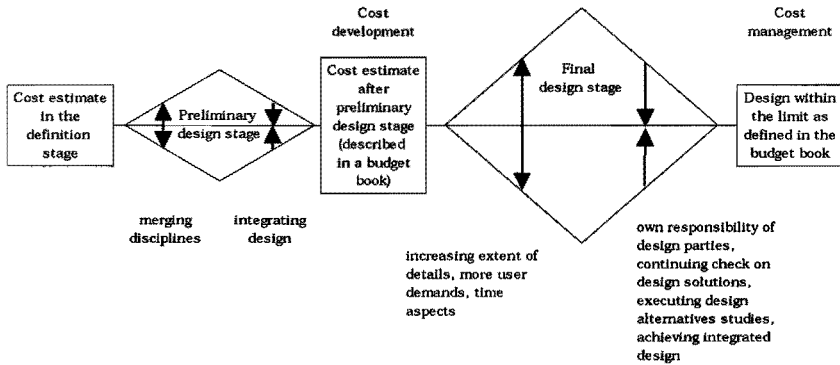


Figure 5.1 Cost management during preliminary and final design stages

4.5.2 Application for the building permit

Even when the project fits within the restrictions as described in the Master Plan and the zoning plan, there are still possibilities that the building permit will be reserved or even rejected for the following reasons:

1. objections from the neighbouring community;
2. the plan does not meet the regulations as described in the National Building Codes;
3. the plan does not fit within the conditions as described in the Monument Law 1988.

To prevent objections by the neighbouring community, if any, organising meetings with these parties seems to be the best solution. This issue has been described in section 4.1.6. Also, the consequences regarding the third reason have been explained in section 4.4.2. Regarding the regulations derived from the National Building Codes, it can be presumed that the redevelopment of the Veemgebouw has met all the demands after an extended feasibility study and a gradual formulation of the brief.

The building permit can be applied after the final design, as described in the SR 1997. As a condition, the monument permit should have been granted by then. The Steering Committee can delegate this task to the project manager. Within 13 weeks after the filing, the Councillors should make a decision about granting the permit. During this period they can put the application to the Welfare Committee, which consists of experts, to have the plan checked on the basis of the Welfare Regulation.

4.6 Building specification stage

Further development of the final design takes place in the building specification stage. The building specifications comprise of the technical and administrative decisions for the construction stage, which are explained with both specifications and drawings. With these documents, the building contractors can compete for the assignment by calculating the cost of realization. After the tender is finalised, which includes price negotiation or possible design changes, awarding of the construction work will follow.

Specific activities that are the responsibility of the project manager in this stage are:

- budget monitoring during the design specification;
- controlling a tender cost estimate;
- indicating parts of the specifications which are relevant for controlling the cost in the construction stage;
- giving the Council advice for the most suitable tendering method according to the European tendering procedure (which he has started in the previous stage);
- checking the building specification documents for price-inflating effects, such as the contractor's risk, prescribed techniques and lack of clarity.

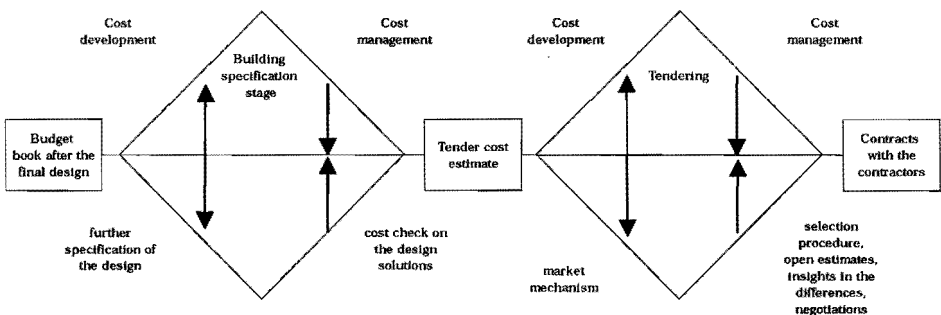


Figure 5.2 Cost management during building specification and tendering stages

4.6.1 Budget monitoring

Based on the same budget book as the previous design stages, budget monitoring in this stage is focussed on the tender cost estimate, which is the last cost estimate of the design before the tender starts. The architect or his cost consultant drafts the tender cost estimate and the project manager controls it. This cost estimate should be based on the recent market situation.

4.7 Tendering

The public tendering procedure can be started early (after the final design) if the Council, in consultation with the design manager, intends to engage a certain type of contractor. Organising this pre-tendering procedure can also save the time required to select a huge amount of bidders by using more straightforward criteria. After the building specification is completed, the last part of the tendering procedure will follow.

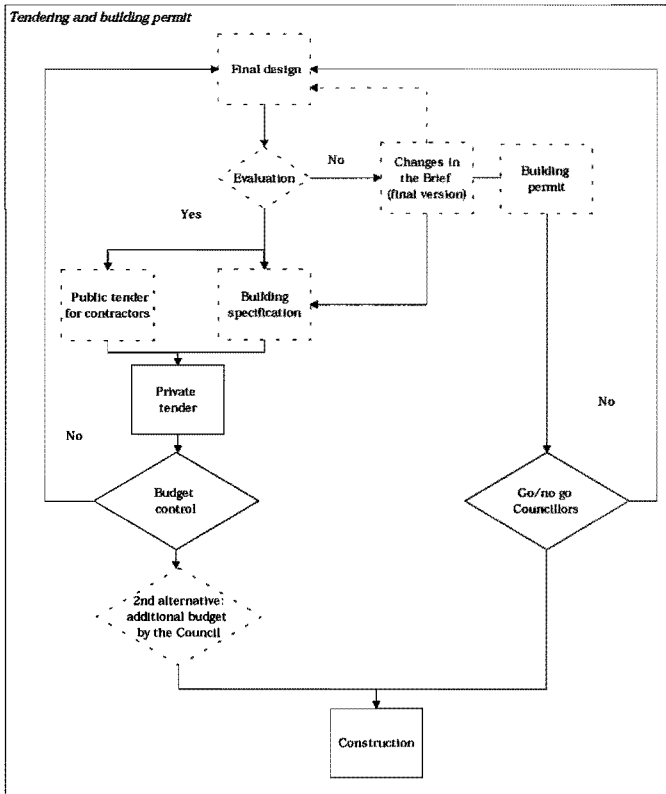


Figure 5.3 Activity chart of the tendering and application for the building permit

4.7.1 Starting the tendering procedure

It has to be decided whether the European tendering procedure has to be applied or not. If the project costs more than € 6.242.028, - (VAT), the Council should proceed the European tender for the building construction, according to the *EG-Richtlijn Werken*.

The purpose of the European tendering procedure is to advance an open market and a fair competition in government projects that cost more than the above limit.

Criteria used for the pre-selection can be more straightforward, such as being certified by ISO-norms and experienced in similar projects. From this first tender, several building contractors can be selected. Closed (*onderhands*) tender using more specific criteria can be applied in the second part, which will take place after the building specifications are finished.

Before starting a tender, an announcement in the Publication of European Community has to take place. There are three types of announcement, which are pre-announcement, tender news and an announcement of granted assignment. For the pre-selection, a pre-announcement is sufficient. More specific announcement such as the tender news, which also includes the financial capacity of the contractor, should be applied in the next tendering stage. The Office of Official Publications from the European community will execute both announcements. The building contractors (bidders) have 36 days to file their bids.

4.7.2 The closed (onderhands) tendering procedure

Invitations for the tender have to be sent at the same time to all candidates chosen from the first selection. Building specifications should be enclosed. More specifications, if applicable, should be sent maximum six days before the tender term expires. The selection criterium for the second tender will be the price. From two types of criteria, the lowest bid or the most economical bid, the second is recommended because the lowest price does not necessarily guarantee the expected quality. Yet, several factors need to be analysed to determine the most economical bid, such as the price, construction time, cost in use, productivity or cost-effectiveness and the technical value.

The project manager should have these criteria announced in the advertisement on the Publication of European Community. The selected candidates will have 37 days to file their bids, counting from the invitation to the tender. Subsequently, the project manager will be responsible for:

- evaluating the result of the tender;
- making financial agreements with the (building) contractor during the private tendering procedure;
- drafting financial reports to the Steering Committee (W. Keyner & M. Rosmalen, 2001).

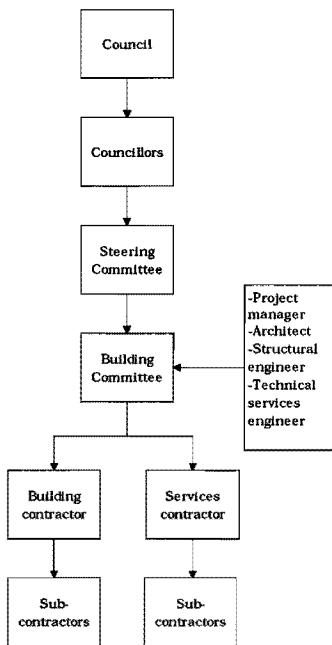
4.7.3 Possible budget overrun

To avoid constant political focus on the budget, too many discussions about the necessity of the large project budget and fear for repeated demands for extra budget, budget reappraisal with Council should be limited to only two significant moments: once at the end of the initial stage and once after the project has been tendered. Those are moments which are most liable to budget changes.

After the tender, the financial result can deviate from the tender cost estimate. However, additional budget over and above this cost estimate should only be requested to the Council if there is a strong and plausible reason. An example of such reason is to increase the building's architectural quality by creating a higher specification interior or to use more sophisticated audio-visual equipment. Otherwise, the final design should be reanalysed and changes should be made to come to an economical solution within the budget.

4.7.4 Appointing construction supervisor and forming a building committee

Shared construction supervision can be considered for the construction stage. This means that the project manager takes charge of the cost, time and quality managements, while the architect takes responsibility upon the aesthetical aspects of the construction. By sharing the construction supervision, the strong points of both parties can be utilized.



Before going further to the construction stage, a new team should be formed. This team replaces the project team and will be chaired by the same party (the project manager). Every month the members of the building committee will come together in the building meeting to discuss the construction progress concerning the time, budget, quality control and more or less work as a result of the (possible) changes in the building specifications. Both building and additional contractors will also attend the building meeting. These contractors have responsibilities towards the building committee for the construction.

The roles that the architect fulfils during the building process and the stages when these roles take place, are described in figure 5.5.

Figure 5.4 The organizational chart for the construction stage

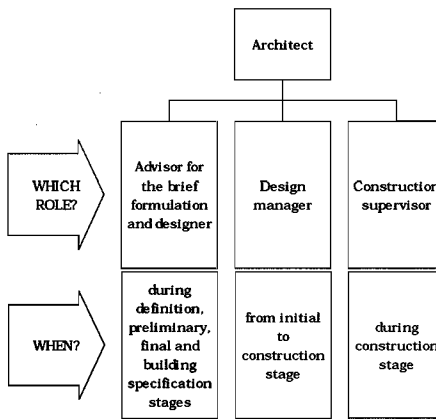


Figure 5.5 Roles of the architect

4.8 The total project schedule

In figure 5.6, the total project schedule is illustrated. Several moments are marked with stars in the Gantt chart as points of attention:

- The duration of the feasibility studies (7) can take longer than the time indicated on the chart. An extended feasibility study is often advisable to reduce the project risks to acceptable levels.
- Creating political and social basis for this project (9). Objections, as described in the previous sections, can cause delay in the following stages. A slack between the period needed for this purpose and the Council approval, can be used to gain support from all stakeholders.
- The Council's approval on the budget (10). If they do not approve the budget, the ambition level has to be redefined.
- Application for the monument permit (20). If this is rejected, the building permit cannot be granted.
- Application for the building permit (28). If there any objection from the stakeholders, the granting can be suspended.

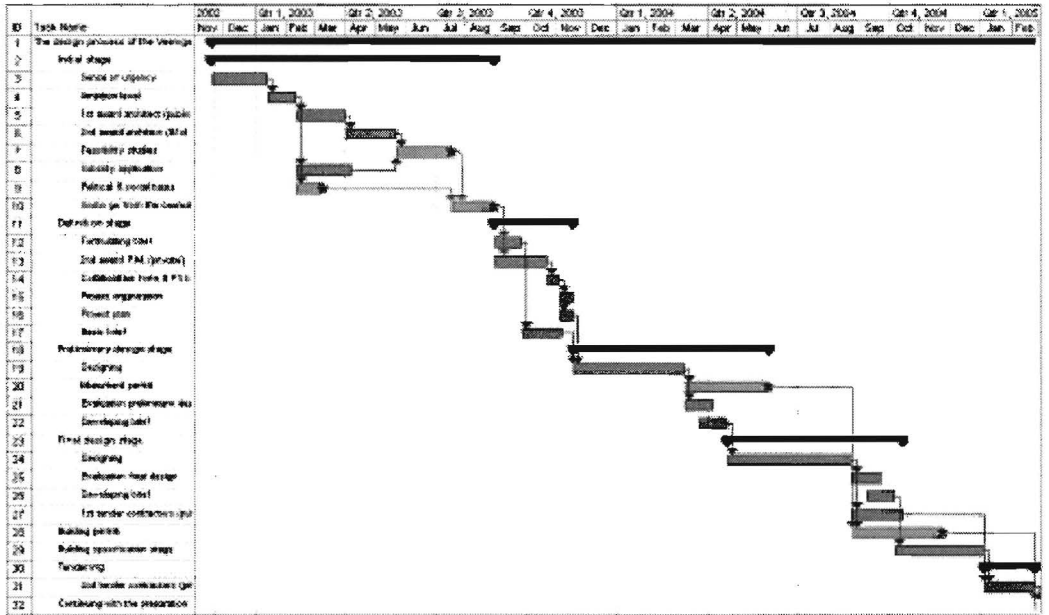


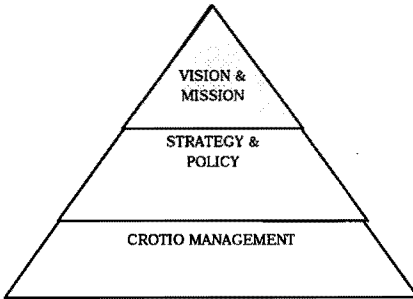
Figure 5.6 The total design schedule

4.9 Conclusions and recommendation

In this closing part, several conclusions from the previous sections are made to formulate recommendations for Council.

Strategy forming

The strategy for a project contains the pattern of choices concerning the client's objectives, the ways these objectives should be realised and the resources required



to achieve these objectives (Aken, van, J.E., 2001). Strategic decisions made by the Council are decisions which have far-reaching consequences for them and contain certain risks. These decisions, which include vision and mission of the new concept, should be made in the initial stage by defining the ambition level, creating a strong political and social basis and executing feasibility studies.

As soon as those decisions are made, the next step is to make them explicit by formulating a basic brief. This document contains specifications required for the following processes, including the available time and budget. A detailed brief in the beginning of the process often already indicates a certain solution. This will reduce the creativity in defining solutions throughout the following stages. Besides, changes are unavoidable as soon as the drawing activities start. Drawings often give causes for adjustments or even lead to a new direction.

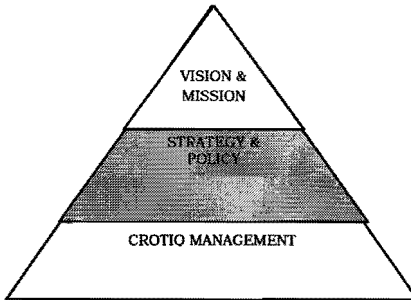
On the other hand, a multiple brief gives the Council and the building users chances to contribute in the design process by clarifying their demands, expectations and conditions on strategic moments. That is why this type of brief is more likely to be chosen.

Besides the brief, it is also important to define the (desired) extent of influence of the Council on the design process, which can be clarified by selecting the right collaboration form.

Organization

The first step in preparing a design process is organising it. Through the Steering Committee, the Council strategy and policies can be performed. By defining a collaboration form, based on the character of the project and the Council preferences, the Council can determine the extent of their influence on the process.

However, to reduce the risks they carried for the project the Council should limit their influence by delegating the tasks and responsibilities to others.



A traditional collaboration form is considered suitable for this project based on several reasons:

- the straightforward character of the project, concerning the conformity with the restrictions from the zoning plan and the Master Plan;
- the Council's desire to control the realization budget, which leads to an open market competition;
- there is no fixed time constraint but for the interest on the Council's capital.

After the collaboration form has been chosen, a project scope to manage the process according to the CROTIQ (Cost, Risk, Organization, Time, Information and Quality) aspects has to be formulated. Thus, the project organization should be formed. Parties are contracted and their tasks, responsibilities and liabilities should be clearly described in their contracts. A Project Start Up meeting is recommended, to internalise the strategy and policies for the project by achieving commitments from each party. Points of attention in the project organization are: the selection of parties, the coordination of the pursuing activities and the communication between all parties.

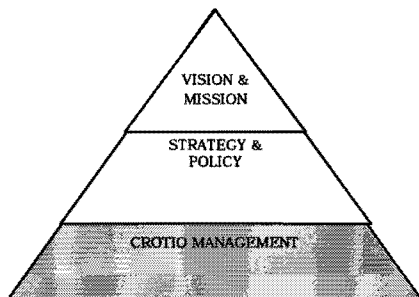
The last consideration concerns the tender. Using an alternative tendering procedure that is divided into two stages can increase efficiency and avoid long bureaucratic procedures caused by having a large number of bidders. Besides saving time analysing and selecting bids, by using this method, the Council could more easily select the type of bidder they prefer.

Control

To provide a smooth course of the project, controlling design and building activities according to the CROTIQ aspects is a must. This is the primary task of the project manager. The project manager leads the project team (consisting of the architect and other consultants), while the architect co-ordinates the design.

In this project, the managerial aspect cost (which directly related to the aspect time and quality) was emphasised and forms a major part of the design evaluation.

Basic quality demands and expectations are already fixed in the basic brief, which was made before the design started. Design evaluations are organised to determine the development of the basic brief, which includes budget adjustments.



Budget overrun is often unavoidable. However, both project manager and architect should try to keep the cost development within the budget. If the outcome of the design revision still does not meet the financial demands and expectations, the project manager can file an additional budget request to the Council. These moments of request should be limited to avoid an endless decision-making process.

Another point of attention for the management is the judicial procedure, which can cause delay during the project course. The project manager is expected to file the permits on time to prevent the delay. In case any objection was filed against the granting of these permits (despite the organised meetings for the stakeholders), it is also his responsibility as the representative of the Council to deal with this issue by negotiating with the objector

Best-suited architect or design office

To select the best-suited architect or design office for the Veemgebouw, several aspects are considered of major importance such as the company profile, size of the company, service packages and organizational structure. Strong-service, large, and matrix-organised firms are preferable for this project (Spekkink, D., 2002). Large and service-oriented firms often indicate reliability, expertise and professionalism. Matrix-organised offices stand for (a certain extent of) standardization, which means that the design process is formally managed and the working procedure is fixed according to certain quality norms.

The definition of those conditions will be described in appendix 7. Additional services such as the brief formulation and feasibility study ability are also a plus. All these specific criteria are derived from the examples described in section 4.2.2.

Part II

Ir. S.J. Scheltens

5 Project development

5.1 What is project development?

In the publication 'Projectontwikkeling', drawn up by the NEPROM (Oude Veldhuis, 1993), the following essential characteristics come to the forefront:

- the project developer takes a care of the real estate projects at his own risk;
- there is integral commitment in the real estate process (from initiative to use);
- in coherence with this integral commitment, the project developer has a co-ordinating task in the process.

The project developer realises buildings for an unknown client. He takes the risk that every entrepreneur has when developing products for the market (not on order). Besides, the project developer has to do with a specific real estate risk. This risk is a consequence of the long preparation time and the long building time that characterises the construction of real estate. Market circumstances can change within several years. Due to these changing circumstances it is possible, that the product no longer answers a market demand.

The project developer is involved in the whole process of initiative, development, realisation and sale. In line with the integral commitment, the project developer is the participant who co-ordinates the whole process and who brings in the other participants. Furthermore, it is the project developer who takes responsibility for the final result.

5.2 The project developer in the real estate process

Market research is one of the first main activities of the project developer. This research has to make clear which is the target group, the desired price-product combination, the desired location quality and the most efficient approach. If the initial research result is attractive, it will be transformed into a schedule of requirements. On the basis of this schedule of requirements, the real estate development process is started.

The management of the real estate development process is the next main task of the project developer. He brings in the participants and takes care of harmony among the participants. Furthermore, the project developer is responsible for requesting the licences and the approvals, conferring with interested parties, the fire department and so on.

Financing the building process can be arranged in various ways. A well-defined financing plan always has to be the basis. Most projects are financed internally, with borrowed capital, or some combination.

The project developer frequently manages the realisation phase. This task, however, can also be given to an external party or the architect.

Most project developers do not want to retain buildings in their portfolios. They want to sell them to their tenants or an investor. Once the project is sold or tenanted out, the process ends for the developer.

5.3 Credo

The data in this sub section is gathered from Credo's internet site (www.credo-ip.nl). Credo is a company which stands for creative and efficient plan development. Creativity is necessary to develop products that address the market demands. Efficiency is essential to achieve a correct cost quality ratio for each project. In each project, a balance between creativity and efficiency must be found. Credo is active in six segments:

1. integral area development;
2. apartments;
3. houses;
4. offices;
5. recreation real estate;
6. business centres.

Credo emphasises integral development, which means the following two key principles.

1. All phases of a building project will followed through. The process is started with the initiative phase. In this phase, an opinion is given about the financial and social feasibility of a project. The urban and constructional design follows as an integral part of the plan development.
2. All trades will be covered. Credo co-ordinates and controls all trades.

The advantage of this integral development is that the entire development process with all disciplines will be carried out and is co-ordinated and controlled by one participant.

The project development process can be divided into phases. In each phase, the time consumption, the costs and the quality will be controlled. The following main phases can be identified:

- initiative/feasibility;
- urban planning design;
- architectural design;
- building preparation;
- realisation;
- use and management.

6 The analysis of a design process: the RIVA-building

6.1 Project Scope

At the West side of the central station in 's-Hertogenbosch a new city centre called the 'Paleiskwartier' is being built. In the Paleiskwartier, 1.400 houses and 180.000 m² business premises are being developed. Furthermore there will be 30.000 m² hotel and catering space and shops. The RIVA building (see figure 6.1) is within the Paleiskwartier.

Controlling a project has to result in (Keyner, Van Rosmalen, 2001) the following outcomes.

- A product that is made in accordance with the requirements (quality and durability). The requirements must be clear and verifiable.
- The project should be ready on time and activities are geared to one another.
- The project is completed within the budget.
- A well functioning and fitting organisation.
- Data management in order to support an efficient project course.

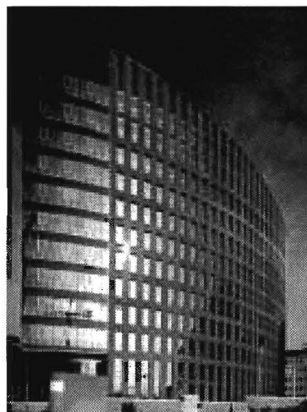


Figure 6.1 RIVA Building

To analyse the RIVA project, two parties have been interviewed: Credo Project Development and Ritzen Architecture and Town Planning.

The results of the interviews can be found in Appendix 10. In Appendix 11, a matrix is given in which the checklist from the AMPK model is used to show what is done during each phase of the design process (initiative, design and detail design).

In the next paragraphs the results are analysed. This is done by looking at each of the CROTIQ aspects. An important source for the comparison is project management literature.

6.2 Phasing the project

In a project, different activities can be distinguished: activities concerning the project content, control activities and decision activities. Phasing a project is an important tool to achieve a logical grouping of the activities concerning the content.

A frequently used phasing model is the NEN 2574 standard. According to the NEN 2574 standard the following phases can be recognised:

1. initiative;
2. feasibility study;
3. definition;
4. scheme design;
5. preliminary design;
6. final design;
7. specifications;
8. tender;
9. building preparation;
10. realisation;
11. completion.

These phases are used in the RIVA project. The phases that are used throughout the design process can be found in Appendix 14.

6.3 Organisation

In the book 'Projecten leiden' (Grootte et al, 1995), activities are listed that are required to attain a good project organisation. The most important are:

1. How can the project organisation be visualised?
2. What are the tasks and responsibilities of the parties?
3. When and what kind of meetings are organised?

The organisation in the RIVA project can be characterised as a building team. This means an early involvement of the contractor, the services engineer, the structural engineer and the building physicist. Credo was also a member of the building team.

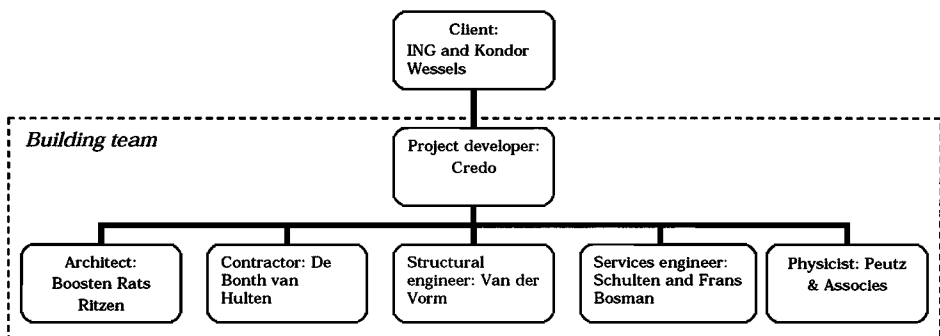


Figure 6.2 The project organisation

The strong points of the building team format are (Van der Woude and Pijpers, 1997):

- Construction experience early in the process. It is possible to tune the design and the realisation;
- no time-consuming tendering process;
- especially usable for projects that have to be completed under time pressure;

- due to the presence of the client in the building team, he has opportunities to influence the process.

Disadvantages of the building team format are (Van der Woude and Pijpers, 1997):

- the price-making process is not done in open competition. Therefore the building price can be higher than it might be if the traditional format is used;
- difficult definition of the responsibilities of the building team parties;
- requires knowledge of the building process and management capabilities of the client.

In the RIVA project the opportunity to influence the process and the timesaving were probably the most important issues in putting together the building team. The disadvantage of the building team format - difficult definition of responsibilities - is insufficiently recognised. The tasks and the responsibilities were not laid down in a document. To avoid problems, it is important to lay down the tasks and responsibilities of each of the parties. This can be done, for example, in a plan of action.

The main meetings were the building team meetings. These meetings were held every three weeks.

6.4 Time

For time management, three main management activities are important:

1. making a time schedule;
2. comparing progress against the plan;
3. take action.

During the design process of the RIVA Building, time schedules were probably not systematically made. Without a time schedule, time management is difficult. Any serious attempt to make a time schedule is better than not making a time schedule at all (Grootte et al, 1995).

Planning the design activity is fundamental to managing the design process (Gray et al, 1994). Different plans can be made; for example an overall plan, which considers all stages of the work, more detailed plans and drawing schedules at the finest level. Bar charts are the most common form of programme presentation. They clearly illustrate the activities to be carried out (Gray et al, 1994).

6.5 Costs

For cost control, four activities can be recognised (Grootte et al, 1995):

1. estimate the costs;
2. calculate the cost-benefit;
3. set up an overall budget divided over the different phases in the design process;
4. set up a system for cost control.

For the RIVA project it is assumed that an estimate of the budget and an estimate of the investment costs have been made. In the beginning, such estimates are made on the basis of index numbers. During the process, they become more detailed.

An important step in the determination of the investment costs is the fixed price made by the contractor. In this way, the building price will be certain early in the process.

The cost benefit summary was the most important document for cost management during the process. According to the architect a missing element was a cost control system.

A cost plan subdivides the budget to provide a separate target for the work of every party. It is necessary to obtain individual commitment to separate cost targets.

When deviations from cost targets are identified the following steps should be taken (Gray et al, 1994).

1. Where an estimate of the cost of a proposed decision exceeds the allowance in the cost plan, the decision should be reconsidered to find a more cost-effective alternative.
2. Where it proves impossible to contain a part of the project within its cost target, part of the contingency fund must be used.
3. Where an estimate falls significantly below the allowance in the cost plan, and upon careful checking that everything has been taken into account, the saving should be added to the contingency fund.
4. Where it is impossible to contain overall costs within the overall budget, even by using the contingency fund, the client must be asked to increase the budget or accept a reduced project.

6.6 Quality

The product quality is laid down in a document called PROM (PROMschrijving). This document does not give exact descriptions of materials but gives requirements and specifications for the building that has to be realised (see Appendix 13). This document is continually updated throughout the process and becomes more and more detailed. At the end of the process (delivery) the PROM is used to check if the building quality matches with the specifications. The PROM is used as a part of the contracts with the various parties.

6.7 Information

Information management can be divided into three main tasks (Groote et al, 1995):

1. identify, register and archive the information;
2. distribute, approve and change the information;
3. plan and control the information.

In the RIVA project the first activity was not consistently done. Some design books made by the architect, for example, had no date on it. Version management was the task of the architect.

There is no information about the second and the third activity. For the second activity it is important (Groote et al, 1995):

- to lay down who sets up the information, who receives the information and what is expected from the receiver;
- to lay down procedures for approval and change of documents.

6.8 Conclusion

Firstly, the activities for each next phase were plausibly specified in the phase documents. It is important not only to look back in the phase document, but also look forward.

Secondly, it is important to choose the correct organisational format. Each format has advantages and disadvantages. In this case the building team format is used. For the project developer time and cost are important aspects. If the time aspect is more important than the cost aspect, one may use the building team format (design is a responsibility of the building team). If the costs are more important than the time span, it may be better to use the traditional format (division between design and construction, formal tender procedure). In this case the time aspect was important (the tenant wanted to occupy the building as quickly as possible), and the building team format was a suitable form. An additional benefit of this format is that early in the process, all the participants get round the table.

A point of organisation that is open to improvement is the laying down of tasks and the responsibilities of the participants. This was not done in this project. Especially if the building team format is used, tasks and responsibilities must be specified. This is necessary because the parties work in a team and so it must be clear who is responsible for what. An explanation of why this is not done, might be the fact that Credo works with familiar parties. The participants know what they can expect of each other.

Thirdly, it is strange that time schedules seem not to have been made in this project. For a project developer the time aspect is particularly significant, so effective time management is crucial. Without time schedules, effective time management will be difficult.

Fourthly, the contractor has agreed on a fixed price, which was evaluated by Credo and the architect. The project developer did not necessarily want to achieve the lowest price, but a price that was realistic. To check the fixed price of the contractor, the client needs building costs expertise. If this expertise is not available at the architect or Credo, a building cost manager must be called in.

Finally, the quality of the building is laid down in the PROM. In this case, the PROM is an accurate document. Specifications can be used when the project is the realisation of a standard office building. Specifications from projects that have been completed before can be copied. Many elements are the same for office buildings.

7 Analysis of the design office: Ritzen Architecture

In this chapter the design office Ritzen Architecture and Town Planning is analysed. The goal was to analyse the architect's firm of the reference project, which was Boosten Rats Ritzen. However, Ritzen has since started his own office. This analysis is based on an interview with mr. Ritzen. The results of this interview are described in Appendix 15.

There are different ways to look at a design office. In this introduction the office profile and the size of the office are analysed. In the next paragraphs the aspects of the 7 S analysis are investigated. The 7S framework consists of seven factors which are important for a successful functioning of an organisation (Van Aken, 2001).

7.1 Profile

According to Coxe and Maister there are three main office profiles (Doorn, 2000):

- strong idea firms;
- strong service firms;
- strong delivery firms.

These three profiles are shown in Appendix 16. Ritzen is (according to mr. Ritzen) a strong service firm. However, it seems more correct that Ritzen is a strong idea firm, with characteristics of the strong service firm. Ritzen is selected by clients because of the design results. But also the provision of services is important. The personal challenge of mr. Ritzen once to design an opera fits a strong idea firm.

7.2 Size

A strong idea firm is usually a small company, up to 20 persons (Doorn, 2000). Ritzen is a small firm, including Ritzen himself there are 7 employees. Several functions are united in one person. A small office is often like a hobby of the owner. It is the same with the office Ritzen. Ritzen is an important person in the office. A small office is likely to have a positive effect on the flexibility and architectural quality. This is a reason why an office might prefer to remain small (Doorn, 2000). A possible increase of the dimension of the office can hardly be stopped, though. For fear to decline orders, an increase in the size of the office seems necessary. Declining one order, can result in the loss of more orders. This fear is probably also going on at Ritzen. Mr. Ritzen wants to grow to an office with 10 to 15 employees.

7.3 Structure

The structure of Ritzen is simple. Mr. Ritzen is the 'chef de bureau', there is a secretary's office and a drawing room. This structure is shown in figure 7.1.

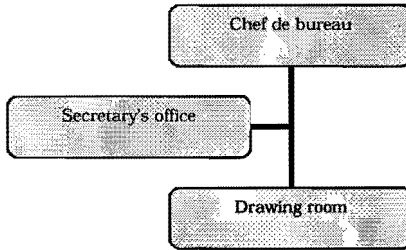


Figure 7.1 Formal structure

Ritzen can be characterised as an entrepreneurial organisation according to Mintzberg's configurations of structure and power. Such an organisation is simple, often small, usually young, not much more than one unit consisting of the boss and everyone else. The structure is informal and flexible, with much of the co-ordination handled by the boss. This allows it to operate in a dynamic environment where it can outsmart the bureaucracies.

Most of the organisations have the simple structure in their first years of existence. Trust in the leader is important (Mintzberg, 2001). The architect's firm Ritzen is such a young organisation and the director of this office is important (see paragraph 7.4).

Table 7.1 The entrepreneurial organisation

Character:	Little differentiation, little standardisation
Dominant coordination mechanism:	Direct supervision
Dominant part:	Strategic top
Situation:	Young and often small Simple primary process Homogeneous and dynamic environment

The simple and informal organisation results in short communication lines (informal communication). This is shown figure 7.2.

7.4 Style

Mr. Ritzen is an important person in the office. Receiving assignments is strongly dependant on his personal relations network. He is responsible for the acquisition of projects. He then makes the first plan and other persons in the office work it out.

Mr. Ritzen realises that authoritarian leadership does not motivate employees, but often he has to be such a leader in order to work efficiently. On the other hand he is not a person who is working in his own room. Often he can be found among the other persons in the office, especially in the drawing room.

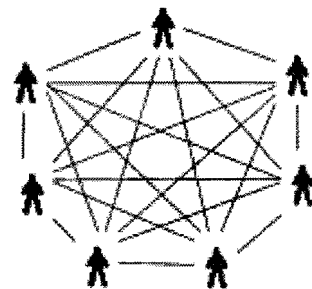


Figure 7.2 Informal structure

Because mr. Ritzen dominates the design, the young designers are working between margins. The risk is that the young designers do not like this and go to another architect's firm. This staff turnover obstructs the emergence of collective knowledge. To prevent this staff turnover, in the architect's firm attending courses is a secondary term of employment.

7.5 Strategy

In Appendix 17 the strategy management for Ritzen is shown. To make this table the Strategy safari from Mintzberg is used. This table is completed as well as possible. When there is no information available, the aspect is skipped altogether. After completion of this table it can be concluded that Ritzen can mostly be characterised with the Design School and the Entrepreneur School. According to the Design School strategy creation can be seen as a process of informal design, basically a process to think of the strategy (Mintzberg et al, 2001). In the Entrepreneur School, the process of strategy creation can be described as the development of a vision of the leader (Mintzberg et al, 2001). Ritzen can mostly be characterised with the Entrepreneur School. Mr. Ritzen has a clear vision for the office. This vision covers the next five to ten years.

7.6 System

There is no information gathered about the formal procedures and information systems to manage the primary process. The employees of Ritzen often use verbal communication. The only information about systems is that Ritzen is developing computer software called Project Administration. With this system it must be possible to control the hours of a project.

7.7 Skills

The strong points of the office are its speed and its flexibility. These can be attractive to a property developer. The real estate market can change in a short period of time, so speed and flexibility are necessary.

7.8 Staff

No information has been gathered about the selection criteria for taking on new personnel. For mr. Ritzen it is important that the office remains in balance. The persons that mr. Ritzen wants to take on are a designer's assistant and a person who can fulfil the function of chef de bureau. These vacancies show that mr. Ritzen wants the office to become less dependant on himself.

7.9 Shared values

Architects attach importance to an informal ambience. Three culture types can be distinguished (Doorn, 2000):

- task culture;
- power culture;
- role culture.

At Ritzen the dominant culture is the power culture. By a power culture the company culture is determined by a charismatic architect (usually the founder of the office). The other designers/employees share this range of ideas and act with respect of this person. There is hardly a formal structure or bureaucracy.

7.10 Conclusion

Ritzen is a strong idea firm. Ritzen wants to design special buildings, but not 'magazine architecture'. Due to the size of the architect's firm, it can deliver this architectural quality. Mr. Ritzen is in the position that he can work out a strong idea (always in a small office when you are the owner). The simple structure of Ritzen has one important risk. One person (mr. Ritzen) is an essential person for the office. When mr. Ritzen falls ill, the major co-ordination mechanism of the organisation will be gone.

This presence of a strong leader can be an advantage, but also a disadvantage. Many people like to work in a small and intimate organisation, in which the leader exactly knows what he wants. Other people think that such a structure has a lot of limitations. Designers, which are creative people, often belong to the last group. The strengths of Ritzen are its flexibility and its speed. These aspects are the result of the dimension of the architect's firm and its structure. Mr. Ritzen wants an office with 10 to 15 employees. One person can informally manage this number of people. When the office becomes larger, some of its strength will probably disappear.

8 A design process for the Veemgebouw: from the project developer's point of view

This process design is set up as an advice to Credo. It is an advice on how Credo can organise the design process for the Speed Shopper. The starting assumptions are:

- DHV-AIB has made an ideas design for the Veemgebouw (Speed shopper), the plan has been found financially sound enough for KVWS to finance it for 100%. KVWS has assigned the development of the project to Credo.
- DHV-AIB has the authorship rights for this design.
- Credo Project Development likes to run this project from close by.
- KVWS has a purchaser for the Speed shopper, at a fixed price and a fixed date of delivery. No party for the restaurant yet.
- The Park Strijp Master Plan, the Zoning Plan, Monument Law and the National Building Code (Bouwbesluit) are applicable. If only the middle part of the building will be removed and the outer parts will remain externally untouched, the design will pass monument preservation requirements.
- The arrival at the restaurant by Zeppelin (as proposed by DHV-AIB) is not feasible. The Zeppelin is left out of consideration.

In the building process different phases can be recognised. There are six main phases, which can be further divided into phases. The main phases are:

1. initiative;
2. definition;
3. design;
4. preparation;
5. realisation;
6. maintenance.

In this section the design process for the Veemgebouw is set up. The design process deals with a part of the building process and is taken from initiative till start realisation.

From initiative to building preparation, the phases shown in figure 8.1 on the next page can be identified. The phases will be explained in the following sub sections.

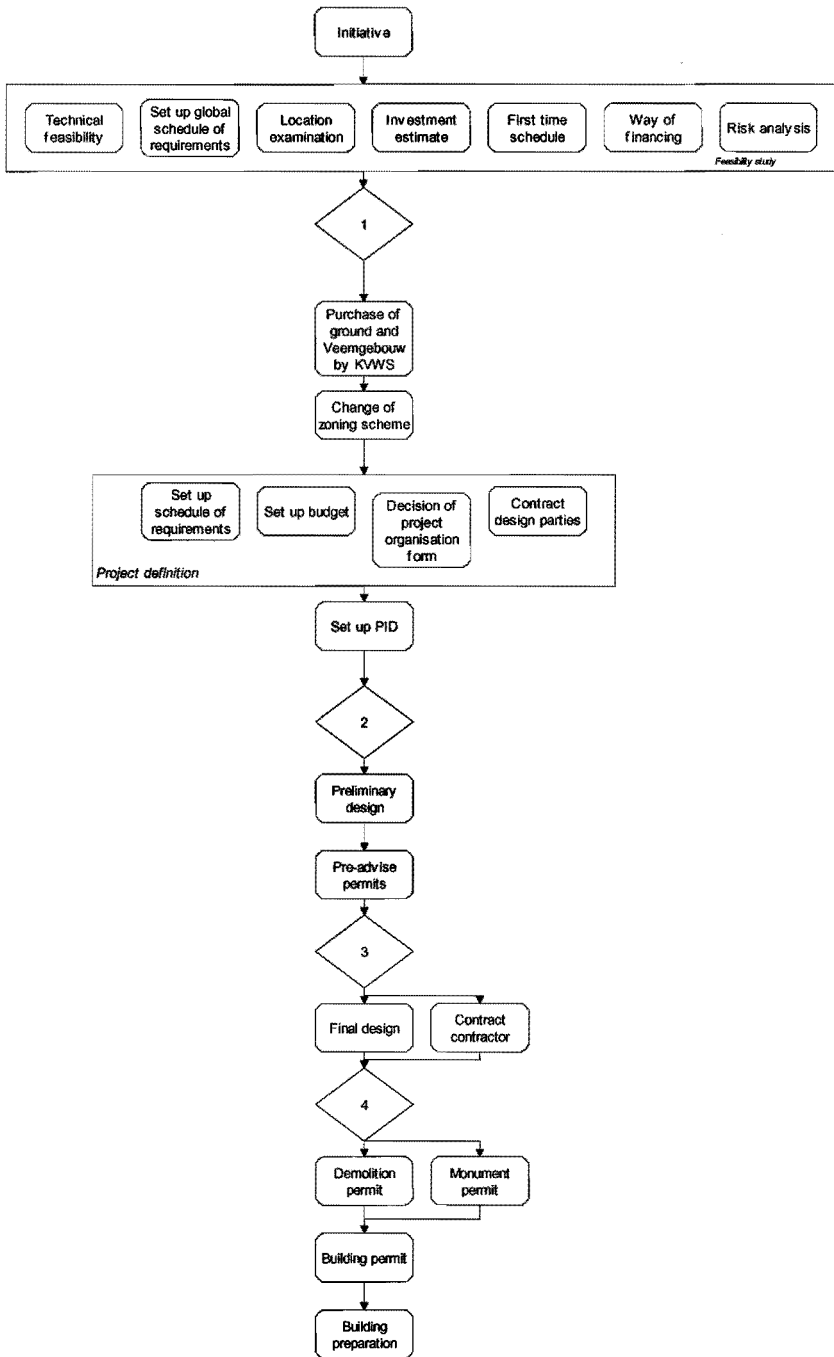


Figure 8.1 Flow chart

8.1 Initiative

The initiative is taken by KVWS on the base of the design made by DHV (Speed Shopper Strijpse Poort). It is necessary to confer with DHV about the authorship rights of the plan. To make it easier to deal with the authorship rights of the Speed Shopper, DHV should play a part in the process. It is advised to hire DHV as a consultant during the feasibility study and the project definition phase. DHV helps Credo with the preliminary investigation (see 8.2.1) and works out the plan to the level of a sketch design. If KVWS and DHV do not agree with each other, the authorship rights of the Speed Shopper plan must be bought by KVWS.

In this phase, Credo is called in as the delegated property developer. Credo is responsible for making the plan, sell or rent the building and realise the plan. In this phase two important aspects to think about are:

- Who will become the owner of the restaurant part of the building? Will KVWS become the owner or is KVWS selling this part, for example to an investor?
- What are the plans for the restaurant?

8.2 Feasibility study

During this phase the technical feasibility, the financial feasibility and the legal feasibility are investigated.

8.2.1 Technical feasibility

Important aspects are:

- Are the original drawings of the Veemgebouw available?
- Is re-use of the transport installations possible?
- Structural quality of the Veemgebouw?

Table 8.1 is taken from the Masterplan (Bakker et al) and shows the quality of the Veemgebouw.

Table 8.1 Quality of the Veemgebouw

Architectural quality:	Moderate/poor
Fits zoning?	Moderate/poor
Structural quality:	Moderate
Functional suitable?:	Highly restricted

The demolition of the middle part will be possible because the Veemgebouw consists of three parts which are structurally unrelated to each other.

- Is it allowed and possible to demolish a part of the façade (Veemgebouw is a monument)? Assumption: if only the middle part of the building will be removed and the outer parts will remain externally untouched, the design will pass the monument preservation requirements.
- Existence of asbestos?
It seems likely there is no asbestos in the building.

It is advisable to do a preliminary investigation for the change of use (Schulte, 1997). DHV (in co-operation with Credo) should have historical knowledge of the Veemgebouw and knowledge of the functional characteristics.

A useful tool for doing this can be the so-called 'aspectmatrix' (Schulte, 1997). The goal of the 'aspectmatrix' is to describe the characteristics of the building. For details of the 'aspectmatrix' see Appendix 18.

8.2.2 Location examination

According to the Masterplan developed by the municipality of Eindhoven and KVWS, the Veemgebouw will become a parking garage. During the feasibility study it is necessary to investigate if it is possible to deviate from this.

The Speed Shopper fits in the Masterplan because:

- 24 hours economy;
- the valuable Veemgebouw will mostly be preserved;
- The Speed Shopper is a concept that honors the original function of the Veemgebouw (storage space);
- the creed of the Masterplan is: urban and special, special, special.
The Speed Shopper is special. Such a project has never been undertaken in The Netherlands before.

At this stage KVWS should confer with the municipality of Eindhoven. Aspects during these meetings should be buying the building and the site, change of the zoning scheme, changes in the traffic infrastructure, etc.

8.2.3 Investment estimate

On the basis of index numbers an investment estimate is made by Credo. It is advised to apply NEN 2631.

By means of this estimate, the cost-benefit summary can be made. An important item in this cost benefit summary will be the BAR. The BAR determines if the plan is financially attractive for Credo. The lay-out that Credo uses for its cost-benefit summaries can be used. An important aspect for the attractiveness of the plan is the percentage of square meters of the restaurant that is already rented out.

The storage part is already sold (see introduction), but if the restaurant part is not rented there are two alternatives:

- Realise the Speed Shopper without a restaurant.
- Realise the Speed Shopper with the restaurant and keep trying to find a renter or a buyer.

In this stage the possibilities of getting grants is investigated. For the restoration of monuments grants are available. Grants on the basis of BRRM 1997 (the decree on state-subsidy for renovated monuments) are available for restoration activities. These grants are only available if the monument is in a poor condition and only for government monuments (www.monumentenzorg.nl). The grant must be applied by the councillors of Eindhoven. The grant can only be granted if the monument is put on a list which gives an enumeration of monuments that must be renovated (www.monumentenzorg.nl). So if the Veemgebouw is not on this list, KVWS should try to convince the council of Eindhoven to put the Veemgebouw on the list.

Till 1 October referring to the year of the grant, the council can apply for a grant at the RDMZ (Rijksdienst voor de Monumentenzorg). The owner (KWVS or Credo) has to apply for the grant well before this date (www.monumentenzorg.nl).

The amount of the grant is high, the percentage is 20% of the restoration cost. The grant comes available after a few years.

8.2.4 Set up a global schedule of requirements

In this stage it is necessary to think about the requirements. As good as possible an initial PROM (see figure 8.2) is set up (for the contents of the PROM, see Appendix 13). The PROM will be renewed and become more detailed throughout the process. The PROM is always a step ahead of the design. There is an interaction between the PROM, the design and the estimates. Constantly the requirements and the costs are balanced to each other.

Phases	Initiative	Feasibility	Project definition	Preliminary design	Final design	Building preparation
Activities						
Programme		Initial PROM	Basic PROM	PROM PD	PROM FD	
Design		Feasibility study		Preliminary design	Final design	Working drawings
Estimate		Investment estimate	Budget	PD estimate	FD estimate	

Figure 8.2 Development of the PROM

8.2.5 First time schedule

Philips is leaving the building in 2007 (Bakker et al) and therefore the construction of the Speed Shopper can start in 2007. The time schedule is made by counting backwards from this point.

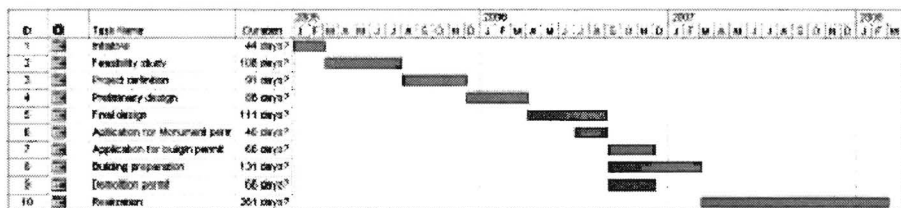


Figure 8.3 First time schedule

8.2.6 Financing

The arrangement of the financing is the task of KVWS. KVWS has to decide in which way the project will be financed. In this stage KVWS has to confer with different parties.

8.2.7 Risk analysis

According to Demmers et al, various risks must be controlled during the building process. In the feasibility study the risks during the entire process must be identified. The chance of occurrence and the consequences must be determined. The risks during the initiative phase, the design phase and the construction phase are listed below. At the start of each phase a risk analysis is made, in which the risks are determined in more detail. For each risk control measures must be formulated and appointments must be made who is responsible for this control measures.

Table 8.2 Risks during the process

Phase	Risks
Initiative phase	<ul style="list-style-type: none"> ▪ Risk of an unwanted outcome ▪ Risk of a low yield ▪ Risk of a loss which cannot be recovered
Design phase	<ul style="list-style-type: none"> ▪ Risk of a poor communication ▪ Risk of design errors ▪ Risk of a not granting a building permit
Construction phase	<ul style="list-style-type: none"> ▪ Risk of errors during the work on the building project ▪ Risk of overspending ▪ Risk of exceeding the completion date

8.2.8 Buying the site

KVWS has to buy the Veemgebouw and the site from the council of Eindhoven who are the owner.

8.2.9 Change of zoning scheme

There are two options to change the zoning scheme. Which one to choose, depends on the progression of the council. The council has to change the zoning scheme in order to realise Park Strijp. If this changing will be completed in August 2006 the destination change for the Veemgebouw can be a part of it. The time schedule is made on the basis of this date. This date is important for Credo, because they have a contract with the user. When August 2006 is not feasible, an "artikel 19 procedure" is required.

8.3 Project definition

8.3.1 Basic PROM

The basic PROM (see Appendix 13) is a contract document between Credo, the design parties and the contractor. The basic PROM consist of:

- departure points and preconditions;
- functional schedule of requirements
- spatial schedule of requirements;
- technical schedule of requirements.

8.3.2 Budget

On the basis of the basic PROM a binding project budget is set. The budget limit for each design discipline is determined from this budget.

8.3.3 Project organisation

Table 8.3 (borrowed from Kolpron, 1996) shows that two organisation methods are suitable for use by the property developer:

1. the Building Team method;
2. the Design and Build method.

Table 8.3 Organisation methods

Types of clients	Organisation methods					
	Traditional	Building team	Management contracting	General contracting	Design and Build	Catalogue plan
Incidental clients	++	+	*	*	++	*
Professional clients						
▪ Owner builder	++	+	*	*	++	*
▪ Investor	-	++	*	*	++	*
▪ Housing association	+	++	0	0	++	*
▪ Property developers	-	++	0	0	++	*

Key to table 8.3:

- * depends on specific circumstances
- ++ most relevant
- + relevant
- 0 neutral
- less relevant

The disadvantage of the D&B method is that the client (in this case Credo) has little opportunity to influence the building process and is put out of action. Credo's business is to be involved during the design process, so the Design and Build method is not a suitable method here. Therefore the building team form is chosen.

The allocation of tasks is shown in table 8.4.

Table 8.4 Allocation of tasks

Allocation of tasks		
Credo	Building team	Contractor
Development of the plan	Contribution of design and construction experience from a specialist point of view of each of the parties	Definition of the manner of construction, planning, construction and control of the construction process
Formation of the building team	Construction documentation	Cost estimates
Supervision during the realisation phase	Detailing PROM	
Cost control		
Development of basic PROM		

8.3.4 Contract design parties and the contractor

In the project definition phase the design parties (apart from the logistic consultant) must be contracted by Credo. The contractor is contracted at the end of the design phase (see 8.5). The design parties are:

The architect

The contract with the architect is according to the SR 97. The assignment is a limited assignment and consists of the standard activities (preliminary design and final design).

According to the SR 97 the fee can be determined in four ways:

1. on the basis of the construction costs;
2. on the basis of the time spend;
3. at a fixed price;
4. at another agreed standard.

The advice is to choose the first one. The fee on the basis of the construction costs gives some price security. Furthermore, it is not necessary to detail the assignment as much as it is for the fixed price option. According to article 75 of the SR the breakdown of the fee for the various design phases is determined. Attention must be paid that the project deals with a restoration project.

The structural engineer

Both the structural engineer and the other consultants must be contracted on the basis of the RVOI. The RVOI-2001 is used to determine the activities of the structural engineer. The activities of the structural engineer refer to the "basispakket" of Appendix C of the RVOI-2001 (except from the tender specifications). The fee of the structural engineer is based on the construction costs.

The electrical engineer and the HVAC and sanitary engineer

The electrical engineer and the HVAC & sanitary engineer are contracted on the basis of the RVOI. The activities of these engineers can be determined by means of Appendix C of the RVOI-2001.

They are contracted for the standard activities at a complete assignment (according the RVOI-2001), except from the activities during the tender phase. The fee of the engineers is based on the engineering part of the building cost.

The logistics consultant

This consultant is not contracted by Credo, but by the Speed Shopper owner. This is possible because this user is already known and appropriate since he is responsible for the transport systems.

In addition to the individual contract, the building team parties (including the building contractor) must conform to a building team agreement. In this building team agreement the mutual obligations of the team members are laid down

The contractor

Besides the building team agreement, the contractor does not have a contract. He is only to be contracted at the end of the final design phase. The contractor signs a declaration of denunciation, which lays down that the contractor does not automatically get the building contract

For a client (Credo) there are four uncertainties about contracting a contractor (Dorée and Schols, 1999):

1. uncertainty about the suitability of the contractor;
2. uncertainty about the completeness of the contract;
3. uncertainty about unforeseen events;
4. uncertainty about the behaviour of the contractor.

These uncertainties can be eliminated by comprehensive contracts, but for Credo an other strategy applies as they prefer selecting a contractor with who they have a good prior experience. The allocation to a known contractor has for a client an uncertainty reducing effect. A client knows from that contractor that he delivers a certain quality and does not abuse an incomplete contract (Dorée and Schols, 1999). Another tool that Credo has, is using the fact that potentially there is a lot of future work for the contractor. The fact is that Credo is involved in the further development of Park Strijp. If the contractor does not deliver quality or the contractor does not think along with the building team, he will not receive an assignment in the future. Under these circumstances the contractor is generally more generous and more flexible (Dorée and Schols, 1999).

The effects are achieved in three directions (Dorée and Schols, 1999):

1. motivation: the contractor knows that the quality will be given integral weight and he will adapt himself to the requirements of the client;
2. flexibility: the prospect of continuity makes the contractor more willing, which makes adjustments during the project less difficult;
3. learning effects: the contractor knows on grounds of prior experiences what is expected.

A closed submission is the way to contract a contractor who has proved his quality before. The disadvantage for Credo is less certainty about the accuracy of the price as it will be based on market conformity instead of on competition.

Figure 8.4 shows the involvement of the different participants.

Parties	Initiative	Feasibility study	Project definition	Preliminary design	Final design	Building preparation
KVWS						
Credo						
Architect						
DHV						
Structural Engineer						
Electrical engineer						
HVAC and sanitary engineer						
Logistics consultant						
Contractor						

Figure 8.4 Involvement of parties

In Appendix 19 the tasks and responsibilities of the different parties are listed.

8.3.5 PID

The Project Initiation Document must be made to correctly direct and manage the project. The PID will provide the baseline for the project. It will be referred to whenever a major decision is taken about the project and used at the conclusion of the project to measure whether the project was managed successfully and delivered an acceptable outcome.

The structure of the PID (Hedeman, 2000):

- background:
 - context of the project
 - reason to start the project
- project definition:
 - objectives
 - scope
 - main deliverables
 - constraints
- assumptions
- project organisation structure
 - structure
 - tasks and responsibilities
- project quality plan
- project plan
- project control
- initial risk log

8.4 Preliminary design

During the design phase, the sketch design made by DHV is worked out. According to the SR 1997 the activities during the preliminary design phase comprise:

- the development of a rough representation of the project concerning the situation, the architectural form, the main lay-out, the structural design;
- the result is a spatial representation and an architectural representation, a check and a spatial reservation for the structural design and the installations (electrical, HVAC and logistic) and a rough estimate of the construction costs.

A rough estimate of the construction costs must be made by the contractor and is evaluated by Credo and/or by the architect. If Credo or the architect have not got this cost expertise a cost manager must be called in.

At the end of the preliminary design phase a pre-advise for the permits is asked from council. In this way the plan is known at the council and therefore it will be easier to receive the building permit at the end of the final design phase.

8.5 Final design

The activities during the final design phase comprise:

- laying down the representation of the project, the internal and the external structure, the structural design, to obtain a picture for each element concerning the construction, the materials and the dimensions and to obtain a complete picture of each room.
- the result is a spatial and an architectural record of the project, the integration of the construction and the services (electrical, HVAC and transport), the materialisation and dimensioning of the project, the typical details and the determination of the construction costs.

The estimate of the construction costs is made by the contractor and evaluated by Credo or the architect. Credo and the contractor then try to determine the price. When there is agreement about the price the contractor is contracted and the price will be fixed (a fixed price). The contractor is responsible for the price during the construction phase. If an agreement about the price is not achieved, the declaration of renunciation must be used and another contractor must be selected. The disadvantage is loss of time and that this new contractor has not been present during the design phases.

8.6 Permits

Credo should apply for three permits by the council of Eindhoven:

1. demolition permit;
2. monument permit;
3. building permit.

The monument permit should be received before the application of the building permit. The building permit is not granted if the monument permit is not granted (Berg et al, 2000).

The application for a permit to demolish a monument or to change the monument in some respects, should be submitted to the councillors. In Eindhoven the monument permit must be applied for at the "Dienst Stedelijke Ontwikkeling en Beheer" (www.eindhoven.nl). Three months after the application council has to inform the applicant, Credo (Berg et al, 2000). The assumption is made that within three months, the permit is received. But the procedure can take more time (Berg et al, 2000):

- council can extend the period from three to six months;
- the possibility to lodge an objection against the decision is open;
- it is possible to appeal against the objection.

The application for a building permit should be submitted to council. The building permit should be granted in thirteen weeks, but this can take more time in case of objections and appeals.

The demolition permit must be granted before the start of the work on the building project. When the application is sent to council simultaneous with the building permit application, the demolition permit will be granted in time.

8.7 Building preparation

In this phase the construction of the building is prepared and the design is translated into working drawings. This is the responsibility of the contractor. This can be done by the contractor, but often the contractor calls in the architect to do this.

The consultants change to a checking task. For their own expertise they will be hired by Credo to check the drawings and calculations.

In this phase the services subcontractors (which are contracted by the contractor) work out the technical services.

8.8 Decisions

In table 8.5, there are four decision moments (see also figure 8.1). During these decision moments a go/no go decision has to be taken. In the table below the conditions and the documents for each decision are listed.

Table 8.5 Decisions

Decision	Documents	Conditions	Actors
1 (Feasibility study)	<ul style="list-style-type: none"> ▪ Investment estimate ▪ First time schedule ▪ Risk analysis ▪ Initial PROM ▪ Contract DHV ▪ Agreement with council 	<ul style="list-style-type: none"> ▪ Technically feasible ▪ Council agrees with plan ▪ BAR attractive ▪ Financing arranged ▪ DHV contracted 	Credo, KVWS
2 (Project definition)	<ul style="list-style-type: none"> ▪ Basic PROM ▪ Budget, cost-benefit summary ▪ PID ▪ Contract architect ▪ Contract structural engineer ▪ Contracts services engineers ▪ Agreement contractor (building team agreement) ▪ Purchase agreement 	<ul style="list-style-type: none"> ▪ Site and Veemgebouw purchased ▪ Parties contracted ▪ Council started change of zoning scheme 	Credo, KVWS, Speed Shopper purchaser
3 (Preliminary design)	<ul style="list-style-type: none"> ▪ PROM ▪ Cost-benefit summary ▪ Preliminary design ▪ PID 	<ul style="list-style-type: none"> ▪ Preliminary design finished ▪ Positive pre-advise for building permit 	Credo, KVWS, Speed Shopper purchaser
4 (Final Design)	<ul style="list-style-type: none"> ▪ PROM ▪ Cost-benefit summary ▪ Final design ▪ PID ▪ Contract with contractor 	<ul style="list-style-type: none"> ▪ Final design finished ▪ Contractor contracted 	Credo, KVWS, Speed Shopper purchaser

9 The related selection of a design office

In this section a design office is described which best suits the process that has been described in the previous section.

Credo has to make a list of preferred architects. That means architects which meet the criteria of Credo (www.architectenkeuze.nl), preferably not more than five offices. Credo has three options to select the architect:

1. direct choice

Credo talks with the selected architects to investigate if the ideas and wishes of Credo match with those of the architect. The architect who best satisfies those criteria is chosen.

2. vision presentation

Credo collects specific information about the project (for example the location, situation sketch, pictures, and so on). The (pre-selected) architects are asked to give their vision on the project. On the basis of this vision the architect is chosen.

3. competition

A competition is a useful tool to gain an insight into the design capacity of a certain domain (for example track young talent).

Credo knows what they want (the design of DHV), therefore the advise is to use the first selection method. It is useless to invest time, money and effort in other selection procedures. In this section an ideal design office will be described. Firstly, the criteria which characterise the design office are listed. Secondly an order of ranking of these criteria is made. On the basis of this ranking a design office is described.

9.1 Criteria

The criteria which are important for Credo for selecting an architect are:

1. profile of the office (strong idea firm, strong service firm, strong delivery firm, see Appendix 16);
2. size of the design office;
3. experience with Credo;
4. experience with restoration projects;
5. cost expertise;
6. speed;
7. flexibility;
8. financial position.

9.2 Ranking

The criteria which are listed in sub section 9.1 are not of the same importance. To determine the ranking of these criteria table 9.1 can be used. The numbers 1 to 8 refer to the criteria in sub section 9.1. These criteria are compared with each other. The most important criterion gets a "1", the less important a "0".

Table 9.1 Ranking of the criteria

	1	2	3	4	5	6	7	8
1	x	0	1	1	0	0	0	0
2	1	x	1	1	1	1	1	1
3	0	0	x	1	0	1	1	0
4	0	0	0	x	0	0	0	0
5	1	0	1	1	x	1	1	0
6	1	0	0	1	0	x	0	0
7	1	0	0	1	0	1	x	1
8	1	0	1	1	1	1	0	x
Sum	5	0	4	7	2	5	3	2

Table 9.1 shows the ranking of the criteria (the criterion with the highest sum is the most important):

1. experience with restoration projects;
2. profile and speed;
3. experience with Credo;
4. flexibility;
5. cost expertise and financial position;
6. size.

9.3 Design of the suitable office

Explanation of the criteria

The first criterion is the experience with restoration projects of the architect's firm. The architect's firm must have done a restoration project (like the Speed Shopper) before. This project must be successfully completed.

The second criterion is the profile of the design office. The profile that suits Credo is a strong idea firm with characteristics of the strong service firm. Credo wants to achieve a special product (talked-about architecture) but also a product that is market conform and delivered within time and budget. This criterion matches with the vision of Credo: creative and efficient property development.

An important aspect for Credo is that the architect's firm has worked with Credo before. The teamwork in the building team will be better, because there is trust and the parties know what they can expect from each other.

The flexibility is connected with this previous aspect. Flexibility is necessary in order to work in a team. The architect must have capacity to work in a team.

A person with cost expertise must be present in the design office. This is necessary because the contractor makes the estimates, which are also to be evaluated by the architect.

The financial position of the architect's firm must be good. The bankruptcy of an office will be harmful for the project. The small-scale of the office is important.

The suitable office

An architect's firm like Ritzen is suitable (see table 9.1). The strong point of such office is the profile of the desired office. This should be the strong idea firm with characteristics of the strong service firm. Due to the ambitions of the project, the design must be a talked-about design. Therefore it is advisable to select a strong idea firm. Often these strong idea firms are small firms. The strong service characteristics are necessary because the architect has to work out the design made by DHV.

Table 9.2 Suitability of Ritzen

Criteria	Design office Ritzen
Experience with restoration project(s)	no
Profile	Strong idea firm
Speed	Yes
Flexibility	Yes
Experience with Credo before	Yes
Cost expertise	No
Size	small
Financial position	?

An office like Ritzen means that some aspects must be different. Firstly, the office must have experience with restoration projects. To investigate this experience with comparable projects, information of reference projects must be retrieved. Secondly, weaknesses of Ritzen (see 7.10) must not be present in the a suitable design office. The evaluation of the fixed price made by the contractor is an important task for the design office. To evaluate the fixed price made by the contractor, cost expertise must be available at the design office.

The office should not be dependant on one person. The cease of this person can have consequences on the project course. Therefore it is necessary to retrieve information about the method of working of the architect's firm.

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Internet:

www.architectenkeuze.nl

www.credo-ip.nl

www.eindhoven.nl

www.monumentenzorg.nl

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Appendices

- *Appendix 1: Mintzberg's ten Safari Schools (1)*
- *Appendix 2: Performance criteria*
- *Appendix 3: Value for money*
- *Appendix 4: RDMZ (State-service for the preservation monuments)*
- *Appendix 5: Meeting structure throughout the design stages*
- *Appendix 6: Points of attention in selecting consultants*
- *Appendix 7: Design Management: the architect*
- *Appendix 8: Tasks, responsibilities and authorities of project and design managers*
- *Appendix 9: Results interviews Credo and Ritzen (process)*
- *Appendix 10: AMPK*
- *Appendix 11: Bruto Aanvangs Rendement (gross starting returns)*
- *Appendix 12: Contents of PROM*
- *Appendix 13: Phases of the design process*
- *Appendix 14: Results interview Ritzen (design office)*
- *Appendix 15: Office profiles*
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- *Appendix 17: Aspect matrix*
- *Appendix 18: Tasks and responsibilities during the design phases of the Speed Shopper*

Appendix 1 Mintzberg's ten Safari Schools (1)

The ten schools describe strategy development as follows:

1. the design school: as a creative process
2. the planning school: as a formal process
3. the positioning school: as an analytical process
4. the entrepreneur school: as a visionary process
5. the cognition school: as a spiritual process
6. the learning school: as an arising process
7. the political school: as a negotiation process
8. the cultural school: as a collective process
9. the environment school: as a responsive process
10. the configuration school: as a changing process

Table I Matrix of Safari Schools characteristics applied to En-en Architects

	DESIGN	PLANNING	POSITIONING	ENTREPRENEUR	COGNITION	LEARNING	POLITICAL	CULTURAL	ENVIRONMENT	CONFIGURATION
Sources	-	-	-	-	-	-	-	-	-	-
Basic discipline	X									
Leaders		X				X				
Aspired message		X		X						
Actual message		X								
Motto		X								
Keywords		X				X				
Strategy	X	X								
Basic process	X	X								
Change		X								
Leading actor				X						
Organization		X						X		
Leading style	X	X	X			X				
Environment		X								
Situation		X								
Organization type	X	X								
Stadium		X								

Source: Mintzberg, H., B. Ahlstrand & J. Lampel, *Op strategie safari*, 2001.

Appendix 2 Performance criteria

- **Flexibility:** graduated scale of improvisation and adjusting possibilities in changing circumstances.

Table I

Subject	Aspects
Total organization	Financial structure and resisting power (exploitation)
Particular organization(s)	Extension and retrenchment possibilities by changes
Sections/departments	Possibilities to change the spatial division
Individual spaces	Spatial exchange

- **Effectiveness:** a certain level of which the organization' (in this case the Council') objectives should be realised. This includes the strategy.

Table II

Organizational characteristic	Effectiveness
Service quality	Building infrastructure system, internal services and communicational facilities
Image	Image of the Veemgebouw to the building user(s) such as employees and visitors

- **Efficiency:** the relation between the exploitation of the Veemgebouw and the required resources.

Table III

Organizational characteristic	Efficiency
Primary processes in the building	A certain level of which the spatial division unites with the primary processes
Organizational structure	User's functional demands determine shape, construction and location
Technology	Installation facilities for health and spa centre, restaurant, parking garages (parking machine, kettle room etc.)
Internal services	Cooking possibilities (for the restaurant), possibility to have organizational meetings, restrooms, parking reception etc.

- Creativity: possibilities for the future performance by updating standard facilities and procedures

Table IV

Organizational characteristic	Creativity
Atmosphere	Stimulating interior, finishes and textures and fixed art policy for the building
Culture	Choice of restaurant and health & spa concept with certain architectural images
(Working) climate	Facilities, attention to users' needs

Source: Erve, van het, H.J., Notebook Bouwprocesleer, 1999.

Appendix 3 Value for money

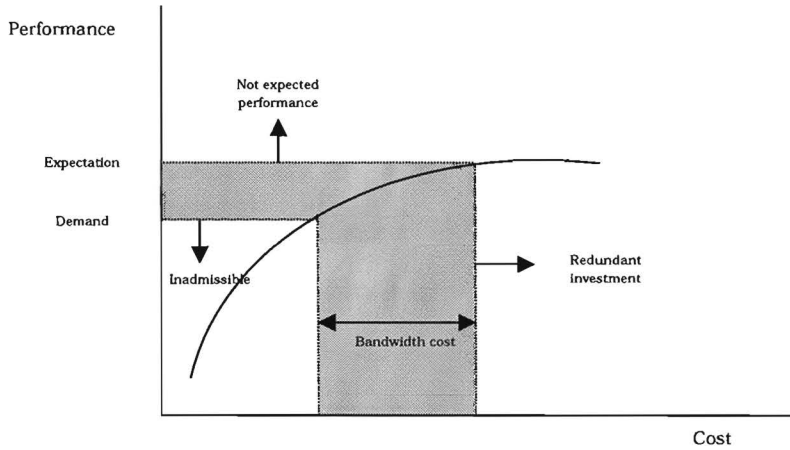


Figure 1 Value for money

Higher performance costs money. The difference between demands and expectations is the bandwidth, where the cost control and adjustment of the process can take place. The cost control takes place by clarifying financial consequences of the specified demands and expectations.

Source: Keyner, W., M. Rosmalen, *Bouwkostenmanagement*, Berenschot-Osborne 2001.

Appendix 4 RDMZ RDMZ (State-service for the preservation monuments)

The state-service for the preservation of monuments (RDMZ), a sub-division of the Ministry of Education, Culture and Science (OC & W), is a central point for information and research concerning the preservation of monuments. On the part of the state secretary of OC & W, this organization is responsible for the execution of the Monument Law 1988 and the subsidy arrangements. RDMZ aims not only at buildings, but also at protection of the historical environment such as city and village structures and the cultural-historical, valuable landscape. Besides the execution of those tasks, RDMZ is also put in charge of:

- granting subsidies for the restoration and maintenance of monuments;
- executing scientific research in the field of preservations of monuments;
- giving technical, urban development, cultural-historical and judicial advice;
- supporting and advising municipalities, provinces and particular organizations in the field of preservations of monuments;
- giving information in general.

Source: www.monumentenzorg.nl :*Rijksdienst voor de Monumentenzorg, 2002.*

Appendix 5 Meeting structure throughout the design stages

Table V

Project:	Project number:
Filled by:	Date:
Version:	Status:

Meeting type	Participants	Frequency	Chairman	Report by	Topics
Steering Committee meeting	Project Councilor Internal officer Project manager (Representatives of building users)	1 x per ..weeks on time: a.m./p.m Location:			
Design meeting	Project manager Design manager Architect Structural engineer Technical services engineer Other consultants, such as: Dubo-consultant V&G-coordinator Interior architect	1 x per ..weeks on time: a.m./p.m Location:			
Users meeting	Project manager Design manager (Representatives of building users Architect	<i>According to the plan</i>			
.....	1 x per ..weeks on time: a.m./p.m Location:			
.....	1 x per ..weeks on time:			

Meeting type	Participants	Frequency	Chairman	Report by	Topics
		a.m./p.m Location:			

Source: Spekkink, D., Afstemmingsmodel Projectkwaliteit, SBR, 2002.

Appendix 7 Points of attention in selecting consultants

Table VI

Project:	Project number:
Filled by:	Date:
Version:	Status:
Concerning: <i>for example architect/ structural or services engineers</i>	

Criteria	Judgement	Action (if needed)			Contracted	
		What	Who	Finish ed in	Not applicable	Processed
<i>Quality</i>						
Capable of demonstrating education & experience level	Yes/no/unclear References/experiences	Asking for office documentation /cv's				
Reputation as architect/consultant	Positive/neutral/negative					
Conception of owns work	Suitable/satisfactory/not satisfactory/not suitable for the project					
Understanding of processes within the project	More than expected/satisfactory/little/none					
Experience with similar project	Yes/no/unclear	Asking for references				
Attitude in relation to integrated project method	Affinity/neutral/no affinity					
Capable of demonstrating the ability to work in a team	Excellent/moderate/bad/unclear					
Firm's working procedure	Suitable/satisfactory/not satisfactory/not suitable for the project					
Costing expertise and cost management procedure	Suitable/satisfactory/not satisfactory/not suitable for					

	the project					
Opinion about Arbo & Dubo aspects	Suitable/satisfactory/ not satisfactory/ not suitable/ for the project					
Certified by quality management system? If not: which guarantee method is applicable?	Yes/no					
Approval and acceptance procedures fixed?	Yes/no	Fix in the contract				
<i>Information</i>						
Well considerate, specified and formulated services	Yes/no	Specify and fix in consultation with intended consultant				
Clarity of consultant's role and position in the project (tasks, responsibilities & authorities)	Yes/no	Consult with the intended consultant and fix in the contract				
Clarity of the interface with and dependency of other consultants	Yes/no	Describe the division of tasks & mutual dependencies in the planning				
Completeness of information facility for the consultant	Yes/no	Go through it with the intended consultant before contract				
Clarity of the intermediary from the client	Yes/no	Define in the contract				
Clarity of the mutual conditions in the contract	Yes/no	Gear the contract to the consultants and merits of the project				
<i>Finance</i>						
Hour rates	Too low/ good/ too high					
Offered amount/fee	Too low/ good/ too high					
Accordance to all financial agreements	Yes/no	Fix in the contract				
Accordance to more/less work	Yes/no	Fix in the contract				

Planning						
Sufficient capacity available in the concerning period	Yes/no/unclear					
Conformity of the consultant to the planning	Yes/no					
Guarantees						
Guarantee needed for knowledge and experience	Yes/no					
Guarantee for on time completion	Yes/no					
Bank guarantee	Yes/no					
Other						
Contribution to risk analysis & actualisation	Yes/no					
Maintenance service	Satisfactory/not satisfactory					

Source: Spekkink, D., Afstemmingsmodel Projectkwaliteit, SBR, 2002.

Appendix 8 Design Management: the architect

Strong-service firms:

- Additional value: reliability and experience, especially in complex building projects
- Services gear to the characteristics of the project and the client's expectations
- Architectural designs are less revolutionary
- Strong focus on functionality
- Examples: EGM Architects, INBO Architects and Wiegerinck Architects

Office size: *Large* offices

- Gear to work on large projects with higher grade of complexity
- The larger the office, the more they have hierarchical function division
- Project architect/designer/assistant
- Designer/project leader/draughtsman/building physics consultant/cost consultant/building specification writer etc.
- Several projects are simultaneously executed
- Several experts are available in-house
- Harmony between efforts and activities demands attention on managerial qualities and excellent management tools

Design office as a matrix organization:

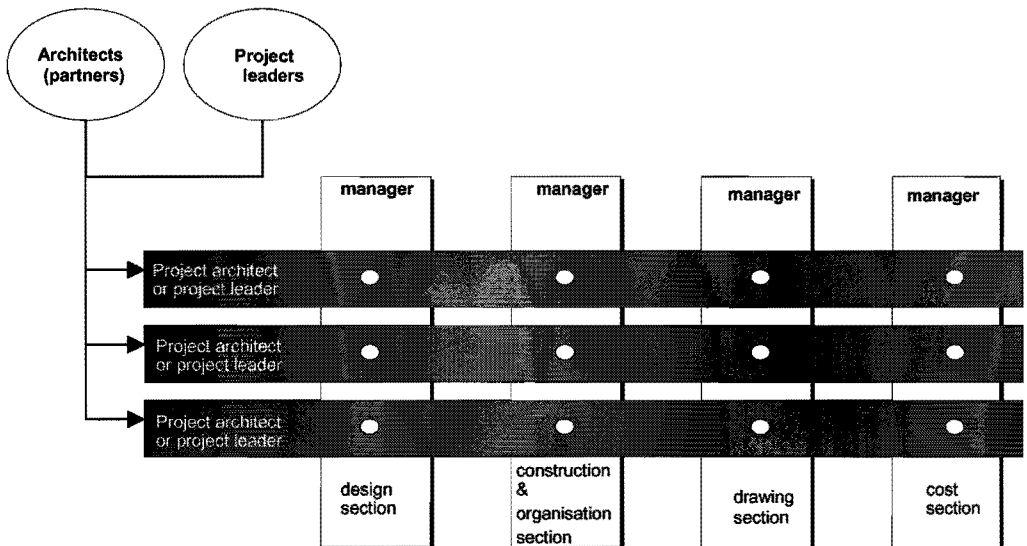


Figure II

Source: Spekkink, D., Design Management Presentation, 2002.

Appendix 9 Tasks and responsibilities of project and design managers

Tasks

In the following table the tasks of design and project managers will be described by project stage. The table starts with the general tasks in the design process and ends with the tasks during the tender.

Notes:

R: the one who has the final responsibility

n.a: not applicable

P: the one who performs the job

Table VII

GENERAL TASKS	PROJECT MANAGER	DESIGN MANAGER
Motivating the design team		R/P
Solving conflicts	R	P
Taking initiatives to achieve the aimed goals	R	P
Giving advices about which participants should be contracted		R/P
Gearing the disciplines within the design team to one another		R/P
Registering and coordinating design changes		R/P
Making the contracts	R/P	
Monitoring the quality plan		R/P
Taking care of the design so that it stays feasible and practicable		R/P
Fixing the fee's	R/P	
Formulating selection criteria & procedures for the participants (in consultation with the Steering Committee and the design manager)	R/P	
Monitoring whether the design meets the building regulations or not		R/P
Informing the Steering Committee about changes in the points of departure or starting points of the project	R/P	
INITIAL & PROJECT DEFINITION STAGE	PROJECT MANAGER	DESIGN MANAGER
Analysing the accommodation needs	n.a.	n.a.
Participating in feasibility studies (together with the internal officer, building users and technical expert = special team)		P
Formulating the brief		P
Making inventories about the expectations concerning the construction		R/P
Making the organizational set-up	R/P	
Defining the responsibilities and liabilities	R/P	
Fixing a design phasing		R/P
Fixing the (expected) result for every stage		R/P
Making a Work Breakdown Structure for every stage	R	P
Making a Process Breakdown Structure for every stage	R	P

Making a capacity plan		R/P
Making a design plan		R/P
Formulating and implementing design information plan		R/P
Determining decision-making and changing procedures	R	P
Formulating risk analysis (executed by the special team)		P
Actualising risk analysis	R	P
PRELIMINARY DESIGN STAGE	PROJECT MANAGER	DESIGN MANAGER
Making a description of the design coordination		R/P
Formulating and monitoring detail plan for this stage		R/P
Consulting the brief with the Steering Committee	R/P	P
Controlling the exchange of design information		R/P
Organising coordination meetings with other design parties (consultants)	P	R/P
Making preliminary cost estimate		R/P
Estimating investment cost	R/P	
Controlling the cost estimate on the budget	R/P	
Indicating the realization time	R	P
Controlling and adjusting project plan	R/P	
Consulting the public bodies (Councillors etc.) and third parties	R	P
Fixing the needs for monument permit		R/P
Applying for the monument permit	R	P
Evaluating the preliminary design (with the participation of the Steering Committee & building users)		R/P
Formulating the stage plan		R/P
Reporting the stage plan		R/P
Fixing the stage plan	R/P	
Changing or adjusting the brief	R	P
FINAL DESIGN STAGE	PROJECT MANAGER	DESIGN MANAGER
Making a description of the design coordination		R/P
Formulating and monitoring detail plan for this stage		R/P
Consulting the brief with the Steering Committee	R/P	P
Controlling the exchange of design information		R/P
Organising coordination meetings with other design parties (consultants)	P	R/P
Making cost estimate		R/P
Analysing the realization time	R	P
Controlling and adjusting project plan	R/P	P
Controlling the cost estimate on the budget	R/P	
Fixing investment cost	R/P	
Analysing the feasibility of the completion time	R/P	P
Applying for the building permit	R/P	
Consulting the public bodies (Councillors etc.) and third parties	R	P
Evaluating the final design (with the participation of the Steering Committee & building users)		R/P
Formulating the stage plan		R/P
Reporting the stage plan		R/P
Fixing the stage plan	R/P	
Changing or adjusting the brief	R	P

BUILDING SPECIFICATION STAGE	PROJECT MANAGER	DESIGN MANAGER
Making a description of the design coordination		R/P
Formulating and monitoring detail plan for this stage		R/P
Consulting the brief with the Steering Committee	R/P	P
Controlling the exchange of design information		R/P
Organising coordination meetings with other design parties (consultants)	P	R/P
Definitive financial decisions	R/P	
Making cost estimate		R/P
Controlling the cost estimate on the budget	R/P	
Controlling and adjusting project plan	R/P	
Organising meeting about conceptual description of the building specification	R	P
Fixing the total construction time	R/P	
Evaluating the building specification (with the participation of the Steering Committee & building users)		R/P
Formulating the stage plan		R/P
Reporting the stage plan		R/P
Fixing the stage plan	R/P	
Determining which specifications still need to be completed (if any)		R/P
TENDER STAGE	PROJECT MANAGER	DESIGN MANAGER
Monitoring the total cost and supervise the spending	R/P	
Giving advices about the tendering method	R/P	
Making preparation of the tender: preparing announcement and preparing the tender documents		R/P
Announcing the tender	R/P	
Sending the tender documents		R/P
Giving information and instructions to the bidders		R/P
Making the notes/procès-verbal		R/P
Selecting the bidders	R	P
Inviting the selected bidders		R/P
Consulting these bidders and processing the possible changes	R/P	P
Negotiating the price with the contractor	R/P	
Bringing out awarding advices	R	P
Evaluating the incoming bids and the possible design changes caused by these bids	R/P	P
Evaluating product facilities of prospective suppliers and making reports about this subject	R	P
Preparing contract documents	R/P	

Responsibilities

The design manager is responsible for two things: formulating optimal design conditions and organizing an optimal design process. The first responsibility concerns executing feasibility studies and translating the users demands and expectations in the brief properly. The second responsibility concerns managing the design process according to the CROTIQ (GROTIK) aspects.

Profile for a suitable design manager

A person who has organization and management insights in the design process is necessary for this position. Communicative and managerial skills are considered crucial. These include the ability to understand different parties during design and construction and having insights in cost, time and quality managements. Besides architectural and managerial backgrounds, practical experience(s) should also be included.

Source: Al Hassan, F. et al, Design Management: een onderzoek naar de positie van de design- en projectmanager, 1999.

Appendix 10 Results interviews Credo and Ritzen (process)

Table VIII Results interviews

Project	RIVA Den Bosch
Office names	project development: Credo architecture: Ritzen
CROTIQ	
money management	Cost-benefit summary made by Credo during each phase An open estimate is made by the contractor Until the final design the contractor is given much freedom, after final design there must be no rumours about contract variations (extra work) Early in the process there was certainty about the building price
risk management	There are no risk analyses made (these are only made when there is uncertainty about the tenant). Different scenario's are made for a complete area that is being developed, not for one building. Only the risks of missing of the second tenant and to start building without a building licence have been studied. These can't be called risks analyses.
organisation	Credo was responsible for making the plan, sell or rent the building and realise the plan. Building team; early involvement of the contractor and the sub-contractors Five parties in the building team: contractor, architect, structural engineer, services engineers and the building physicist
time management	Phases: initiative, sketch design, preliminary design, final design, building preparation and realisation. During each phase there are four primary activities: programme (what has to be made?), synthesis (designing, the creative process), analysis (check the design with the requirements), evaluation (decision go/no go) A planning hasn't been made, the client asked to go as fast as possible.

	<p>Only the finish data for the preliminary design, the final design and the building licence were known.</p>
<p>information management</p>	<p>The most important documents were: PROM, drawings, cost-benefit summaries and the notes of the building team meetings. Important documents (for example the cost benefit summaries and information about the tenants) were also sent to the client. The documents were sent by post, by fax or provided at the meetings.</p>
<p>quality control</p>	<p>The quality was recorded in the PROM. The PROM doesn't give exact descriptions but gives performances. It is important to find a balance between quality and a building that is in conformity with the market. To find this balance it is important that the realisation of the design is a responsibility of the entire building team.</p>

Appendix 11 AMPK-model

Table IX Checklist AMPK during initiative, design and detail design

	Initiative	Design	Detail design
Start document and phase results	no information	The phase document made in the previous phase. The phase document consists of the design, the cost-benefit summary and a check of the feasibility. There is no information on what the phase document lays down as has to be done in the phase.	The phase document made in the previous phase. The phase document consists of the design, the cost-benefit summary and a check of the feasibility. There is no information on what the phase document lays down as has to be done in the phase.
Organisation structure	no information	building team	building team
Matrix of responsibilities	not done	not done	not done
Selection criteria	Former experiences were important, further no information	Former experiences were important, no information	Former experiences were important, no information
Feasibility study	BAR (Bruto Aanvangst Rendement), this is the gross starting return. See Appendix 12 for an explanation of the BAR	X	X
Program of requirements		PROM (for the contents of the PROM see Appendix 13)	PROM (for the contents of the PROM see Appendix 13)
Risk analysis	no information	no information	no information
Time planning	not done	not done	not done
Information	The media used for sending information were: fax, post. Documents were also given at the beginning of the meetings.	The media used for sending information were: fax, post. Documents were also given at the beginning of the meetings.	The media used for sending information were: fax, post. Documents were also given at the beginning of the meetings.
Meetings	no information	Building team meetings (three weekly). Participants: contractor, architect, structural engineer, property developer, services engineers and the building physicist. Format of minutes: opening, last minutes, municipality and authorities, design, PROM, construction, time planning, technical installations, next meeting	Building team meetings (three weekly). Participants: contractor, architect, structural engineer, property developer, services engineers and the building physicist. Format of minutes: opening, last minutes, municipality and authorities, design, PROM, construction, time planning, technical installations, next meeting

Document management	no information	no information	no information
Budget	no information	No information about the budget. Important aspects for cost management were the open estimate made by the building contractor and the cost-benefit summary.	No information about the budget. Important aspects for cost management were the open estimate made by the building contractor and the cost-benefit summary.
	Initiative	Design	Detail design
Start document and phase results	no information	The phase document made in the previous phase. The phase document consists of the design, the cost-benefit summary and the a check of the feasibility. There is no information about what the phase document lays down what has to be done in the phase.	The phase document made in the previous phase. The phase document consists of the design, the cost-benefit summary and the a check of the feasibility. There is no information about what the phase document lays down what has to be done in the phase.
Organisation structure	no information	building team	building team
Matrix of responsibilities	not done	not done	not done
Selection criteria	Formerly experiences were important, further no information	Formerly experiences were important, no information	Formerly experiences were important, no information
Feasibility study	BAR (Bruto Aanvangst Rendement), this is the gross starting returns. See Appendix 12 for an explanation of the BAR	X	X
Program of requirements		PROM (for the contents of the PROM see Appendix 13)	PROM (for the contents of the PROM see Appendix 13)
Risk analysis	no information	no information	no information
Time planning	not done	not done	not done
Information	The media used for sending information were: fax, post. Documents were also given at the beginning of the meetings.	The media used for sending information were: fax, post. Documents were also given at the beginning of the meetings.	The media used for sending information were: fax, post. Documents were also given at the beginning of the meetings.
Meetings	no information	Building team meetings (once in the three weeks). Participants: contractor, architect, structural engineer, property developer, services engineers and the physicist. Fornat minutes: opening, last minutes, municipality and authorities, design, PROM, construction, time planning, technical installations, next meeting	Building team meetings (once in the three weeks). Participants: contractor, architect, structural engineer, property developer, services engineers and the physicist. Format minutes: opening, last minutes, municipality and authorities, design, PROM, construction, time planning, technical installations, next meeting

Document management	no information	no information	no information
Budget	no information	No information about the budget. Important aspects for cost management were the open estimate made by the building contractor and the cost-benefit summary.	No information about the budget. Important aspects for cost management were the open estimate made by the building contractor and the cost-benefit summary.

Appendix 12 Bruto Aanvangs Rendement (gross starting return)

In the real estate practice several methods are available to determine the value of real estate. The "Bruto Aanvangs Rendement" (BAR) is a well-known method. Credo has used this method, however, in the book *Bouwkostenmanagement* (Keyner and Van Rosmalen, 2001) it is mentioned that many professional property developers and investors use more advanced calculation methods.

The most used definition of the BAR is the ratio of the gross yearly theoretical cash flow and the total initial investment. The gross theoretical cash flow is the same as the gross rent proceeds, when the building is completely rented in the first year.

$$\text{BAR} = \frac{\text{Gross rent proceeds (completely rented in the first year)}}{\text{Total initial investment}}$$

The calculated BAR has a restricted relation with the real return of an investment. The real return of an investment is, for example, determined by the problem of unoccupied new buildings.

The averages of the BAR's used by investors are yearly published by the real estate office DTZ Zadelhoff.

Table X Gross starting returns in the Netherlands (in percentages)

	1997	1998	1999	2000
Offices in the Randstad	7.00-8.00	6.75-7.25	6.40-7.00	6.75-7.25
Offices outside the Randstad	8.00-9.00	7.25-8.25	7.00-7.75	7.40-8.40
Industrial buildings in the Randstad	9.00-10.00	8.00-9.00	7.75-8.50	7.75-8.50
Industrial buildings outside the Randstad	9.75-10.25	9.00-9.50	8.50-9.00	8.00-9.00
Shops in the Randstad	7.50-8.50	6.75-7.75	6.75-7.75	6.75-7.25
Shops outside the Randstad	8.00-8.75	7.25-8.00	7.00-8.00	6.75-7.25

The information in this appendix is derived from dossier 24 of the book *Bouwkostenmanagement* (Keyner and Van Rosmalen, 2001).

Appendix 13 Contents of PROM

1. Introduction
 - 1.1. Goal of the PROM
 - 1.2. Scheme and structure
2. General plan description
 - 2.1. Urban
 - 2.2. Architectural
 - 2.3. Functional
 - 2.4. Cost centre determination
3. Performance requirements
 - 3.1. Legal regulations
 - 3.2. Energy use
 - 3.3. Building climate
 - 3.4. Building physics
 - 3.5. Flexibility
 - 3.6. Security
 - 3.7. Cleaning maintenance
 - 3.8. Technical maintenance
 - 3.9. Environment
 - 3.10. Extension possibilities
 - 3.11. Changes
 - 3.12. Guarantees
4. Constructional facilities
 - 4.1. Foundation
 - 4.2. External walls
 - 4.3. Columns and beams
 - 4.4. Concrete walls
 - 4.5. Internal walls
 - 4.6. Floors
 - 4.7. Stairs
 - 4.8. Roofs
 - 4.9. Ceiling finishing
 - 4.10. Other finishing
5. Technical facilities
 - 5.1. Heating system
 - 5.2. Ventilation system and air handling
 - 5.3. Gas facilities
 - 5.4. Water facilities
 - 5.5. Electrical engineering
 - 5.6. Data and telephone infrastructure
 - 5.7. Communication facilities
 - 5.8. Transport facilities
 - 5.9. Security installations

- 6. Furnishing
 - 6.1. Entrance hall
 - 6.2. Sanitary facilities
 - 6.3. Pantry's
 - 6.4. Restaurant
 - 6.5. Basement
- 7. Additional inventory
 - 7.1. Signposting
- 8. Terrain
 - 8.1. Basement deck
 - 8.2. Parking facilities
 - 8.3. Entrance parking basement
 - 8.4. Fencing
 - 8.5. Lighting
 - 8.6. Sewerage
 - 8.7. Landscaping

Appendix 14 Phases of the design process

Table XI Phases and activities

Phase	Activities
Initiative	<ul style="list-style-type: none"> ▪ No information what is done in this phase ▪ An assumption is that a feasibility study * and a schedule of requirements are made. So a the goal of the project is known (the budget and the quantity of square metres)
Sketch design	<ul style="list-style-type: none"> ▪ Selection of the architect ▪ Mass study ▪ Rough layout drawing ▪ Opening up
Preliminary design	<ul style="list-style-type: none"> ▪ Selection of the contractor, the services and the structural engineer, the building physicist. ▪ Front view drawings and façade cladding ▪ Exact dimensioning of the building ▪ Functional floor plan ▪ First Open estimate made by the contractor ▪ Check the open estimate (Credo and architect)
Final design	<ul style="list-style-type: none"> ▪ Working details ▪ Elaboration of the façade and the floor plans as a result of structural standards, technical services standard and building physics standards ▪ Control the open estimate made by the contractor and check the desired quality level (by the building team)
Building licence	<ul style="list-style-type: none"> ▪ Building licence drawings ▪ Process the rules in the plan in favour of the building licence request (among other things national building decree, "DUBO" (sustainable building) list, "V&G" (safety and health) plan, "EPN" (energy performance standard) calculation ▪ Final materials list and final working details
Working drawings	<ul style="list-style-type: none"> ▪ All necessary drawings in favour of the execution of the building project and exact dimensioning ▪ Complementary detail drawings and elevations in favour of a good building preparation
Phase	Activities
Initiative	<ul style="list-style-type: none"> ▪ No information what is done in this phase ▪ An assumption is that a feasibility study * and a schedule of requirements are made. So a the goal of the project is known (the budget and the quantity of square metres)

Sketch design	<ul style="list-style-type: none"> ▪ Selection of the architect ▪ Mass study ▪ Rough layout drawing ▪ Opening up
Preliminary design	<ul style="list-style-type: none"> ▪ Selection of the contractor, the installers, the structural engineer, the building physicist. ▪ Front view drawings and façade cladding ▪ Exact dimensioning of the building ▪ Functional floor plan ▪ First Open estimate made by the contractor ▪ Check the open estimate (Credo and architect)
Final design	<ul style="list-style-type: none"> ▪ Working details ▪ Elaboration of the façade and the floor plans as a result of structural standards, installation technical standard and building physical standards ▪ Control the open estimate made by the contractor and check the desired quality level (by the building team)
Building licence	<ul style="list-style-type: none"> ▪ Building licence drawings ▪ Process the rules in the plan in favour of the building licence request (among other things national building decree, "DUBO" (sustainable building) list, "V&G" (safety and health) plan, "EPN" (energy performance standard) calculation ▪ Final material list and final working details
Working drawings	<ul style="list-style-type: none"> ▪ All necessary drawings in favour of the execution of the building project and exact dimensioning ▪ Complementary detail drawings and elevations in favour of a good building preparation

*: A feasibility study can contain (Keyner, Van Rosmalen, 2001):

- Global schedule of requirements
- Location investigation
- Accommodation check
- Alternatives study
- Investment estimate
- Exploitation estimate
- First time schedule
- Financing

Appendix 15 Results interview Ritzen (design office)

Table XII Results interview Mr Ritzen

Office name	Ritzen architecture and town planning
Number of personnel	7
Yearly turnaround	€ 500.000-600.000
Type of projects	functional architecture and housing
Excellence	speed and flexibility
Strategy	To remain active and to profile in the fields of architecture and town planning for housing and functional architecture. S. Ritzen doesn't want to specialise in one of those.
Ambitions	To become an organisation with 10-15 employees (within a period of five years) To find a partner to guarantee continuity (within a period of ten years)
External contacts	-
In-house skills	Making urban planning designs and architectural designs Making mass study's Quick arrangement of presentations Participate in complex processes with different interests and participants Smooth transition between design and digital information (drawings) Interior designer is present Make digital drawings for all the phases recognised in the SR
Hired skills	Making specifications and estimates
Office wide meetings	Two-weekly
Quality control	No quality handbook (is in the head of S. Ritzen)
Risk analysis	No information
Training	Attending courses is a secondary term of employment. After the course the person has to give a presentation for the other persons in the office and he/she has to make a summary.
Overtime	No information
Personnel events	Once in the month a drink on Friday after five o'clock Christmas activity Yearly architecture trip

7 S	
structure	<p>Chef de bureau: S. Ritzen (acquisition, personnel manager, supervisor of the drawing room)</p> <p>Secretary's office (secretary work, book-keeping, general management support)</p> <p>Drawing room (horizontally organized, for each project a project leader is appointed)</p>
style	<p>S. Ritzen knows that he has to delegate responsibilities, but often he has to pull the emergency brake in order to work fast and efficient. He stimulates people to do this by themselves.</p> <p>S. Ritzen is establishing a project administration. With this system it will be possible to estimate each phase during the project.</p> <p>S. Ritzen determines the goals and orientates on the environment. He is the one who manages the processes efficiently and stimulates the employees.</p>
strategy	See above
system	<p>Verbal communication in the office and post boxes at the secretary office are used. Now and then there are mailings</p> <p>The office isn't ISO-certificated; this is not necessary, the client doesn't ask for it.</p>
staff	<p>Following courses is stimulated. See above</p> <p>Important in employing people is that the office has to remain in balance.</p>
skills	<p>Strong points see above</p> <p>Improvements: the office has to become less dependent of S.Ritzen</p>
shared values	<p>Ideas of employees are received in a positive way.</p> <p>A personal challenge for S.Ritzen is to design an opera or another public building. A challenge for the office is to grow to a pleasant working team of 10-15 persons.</p>
CAS Management	
organisation type	type (2) scarcely threaten adapted, small (SAS) organisation. The type 2 organisation is characterised by a simple organisation and a stable environment.
Office profile	Strong service
Strategy Safari schools	See Appendix 17

Appendix 16 Office profiles

These sheets are a presentation of D. Spekkink.

Strong idea firms

- "Innovative creativity in order to make progressive designs for unique projects"
- 'Magazine architecture'
- MVRDV, OMA,
Wiel Arets, Bert Dierikx



Strong service firms

- Added value: reliability and experience, especially in complex tasks
- Service is geared to characteristics of the question and the desires of the client
- Architectural designs generally less progressive
- Strongly directed towards functionality
- EGM, Wiegerinck Architecten,
INBO



Strong delivery

- Added value: efficient service for routine assignments
- Repeating of solutions that have proved to be good before
- Support at reducing risks (quality and money)
- Talked-about architecture is not the main objective
- Emphasis on technical and functional quality



Appendix 17 Mintzberg's ten Safari Schools (2)

There are ten different views of strategy. These different views can be represented in ten schools of thought (Mintzberg et al, 2001).

In the matrix below it is analysed with which schools Ritzen can be represented.

Table XIII Matrix Strategy Safari

	1	2	3	4	5	6	7	8	9	10	Remarks
Base discipline	X										No base discipline (compare with architecture)
Leadership											
Aspired message				X							Ritzen has a clear vision
Actual message											
Motto						X					If you don't succeed the first time, try again.
Keywords						X			X		Step by step improvement, gradually developing strategy, adaptation, uncertainty, complexity
Strategy				X							Personal, unique perspective
Basic process	X										Rational, simple and informal, judging, considered
Change	X										Now and then, abruptly
Lead actor	X			X							Chief executive (as architect), leader
Organisation				X							Pliable, simple
Management	X										Dominant, judging
Environment	X										Fitly (source of threats and opportunities)
Situation				x							Dynamic, but simple
Organisation type				x							Enterprising (simple, centralised)
Stage				x							Starting company

Explanation of the table:

1: Design school	6: Learning school
2: Planning school	7: Politics school
3: Positioning school	8: Culture school
4: Entrepreneur school	9: Environment school
5: Cognition school	10: Configuration school

Appendix 18 Aspect matrix

By means of the aspect matrices the characteristics of a building can be described in great detail. Three aspect matrices can be identified:

1. a matrix which describes the social aspects;
2. a matrix which describes the urban development aspects and the constructional aspects;
3. a matrix which describes the building technology aspects.

In each matrix different levels are identified. In the matrices some examples are given.

Table XIV Social aspects

Social aspects				
Levels	Social/economical/historical	Judicial	Financial	Imaginary
Government	History		Grants	
Owner			Profits	
User				
Third parties				
Future owner	Who?		Wishes, possibilities	
Future user	Who?		Wishes	

Table XV Urban development and constructional aspects

Urban development and constructional aspects				
Levels	History	Morphology	Spatial/functional	Use
Area		Characteristics, qualities	Location, infrastructure	Traffic, parking, public transport
Location		Characteristics, qualities	Opening up of the site	Traffic, parking, delivery and removal of goods
Site			Entrance, windows, emergency exits	
Building (exterior)			Use space, incidence of light	
Building (interior)				Main arrangement
Rooms				Detailed description of all rooms

Table XVI Building technology

Building technology				
Levels	Social/economical/historical	Judicial	Financial	Imaginary
Government				
Owner				
User				
Third parties				
Future owner				
Future user				

Appendix 19 Tasks and responsibilities during the design phases of the Speed Shopper

Table XVII Tasks and responsibilities

Phase	Main activities	Actors	Responsibility
Initiative		KVWS, Credo, DHV	KVWS
Feasibility study	Technical feasibility	Credo, DHV	Credo
	Global schedule of requirements	Credo	Credo
	Location examination	Credo, KVWS, council of Eindhoven (GEM)	Credo
	Investment estimate	Credo	Credo
	First time schedule	Credo	Credo
	Financing	Credo, KVWS	KVWS
	Buying Veemgebouw and ground	KVWS, council, Philips	KVWS
	Change of the zoning scheme	KVWS, Credo, council, local authorities	Council
	Risk analysis	Credo	Credo
Project definition	Set up a schedule of requirements	Credo	Credo
	Set up the budget	Credo	Credo
	Choose the project organisation form	Credo	Credo
	Contract the design parties	Credo	Credo
	Set up PID	Credo	Credo
Preliminary design (activities according to the SR)	A three-dimensional representation of the project.	Credo, architect, structural engineer, consultants (electrical engineer, HVAC and sanitary engineer), contractor	Architect
	Main plan and global dimensioning of the structural design and orientation in the foundation principles.		Structural engineer
	Main plan electrical equipment and water equipment including a capacity definition and global ductwork, main plan transport systems		Consultants
	Cost estimate.		Contractor
	Permits.		Credo, architect
	Analysis feasibility final acceptance date.		Credo
Energy performance standard, safety and health, etc.	Architect		
Final design (activities according to the SR)	A three-dimensional representation of the project.	Credo, architect, structural engineer, consultants (electrical engineer, HVAC and sanitary engineer), contractor	Architect
	Dimensioning and typical details of foundation and structural design.		Structural engineer
	Dimensioning and capacity definition of the electrical equipment and water equipment, ductwork, dimensioning transport systems.		Consultants
	Cost estimate.		Contractor
	Permits.		Credo, architect
	Analysis feasibility final acceptance date.		Credo
Energy performance standard, safety and health, etc.	Architect		

Permits		Credo, architect, council of Eindhoven	Credo
Building preparation	Working drawings	Credo, architect, structural engineer, consultants (services and logistic), contractor	Contractor
Phase	Main activities	Actors	Responsibility
Initiative		KVWS, Credo, DHV	KVWS
Feasibility study	Technical feasibility	Credo, DHV	Credo
	Global schedule of requirements Location examination	Credo Credo, KVWS, council of Eindhoven (GEM)	Credo Credo
	Investment estimate	Credo	Credo
	First time schedule	Credo	Credo
	Financing	Credo, KVWS	KVWS
	Buying Veemgebouw and ground	KVWS, council, Philips	KVWS
	Change of the zoning scheme	KVWS, Credo, council, local authorities	Council
	Risk analysis	Credo	Credo
Project definition	Set up a schedule of requirements	Credo	Credo
	Set up the budget	Credo	Credo
	Choose the project organisation form	Credo	Credo
	Contract the design parties	Credo	Credo
	Set up PID	Credo	Credo
Preliminary design (activities according to the SR)	A three-dimensional representation of the project.	Credo, architect, structural engineer, consultants (electrical engineer, HVAC and sanitary engineer), contractor	Architect
	Main plan en global dimensioning of the structural design and orientation in the foundation principles.		Structural engineer
	Main plan electrical equipment and water equipment including a capacity definition and global ductwork, main plan transport systems		Consultants
	Cost estimate. Permissions.		Contractor Credo, architect
	Analysis feasibility final acceptance date. Energy performance standard, safety and health, etc.		Credo
Final design (activities according to the SR)	A three-dimensional representation of the project.	Credo, architect, structural engineer, consultants (electrical engineer, HVAC and sanitary engineer), contractor	Architect
	Dimensioning and typical details of foundation and structural design.		Structural engineer
	Dimensioning and capacity definition of the electrical equipment and water equipment, ductwork, dimensioning transport systems.		Consultants
	Cost estimate. Permissions.		Contractor Credo, architect
	Analysis feasibility final acceptance date. Energy performance standard, safety and health, etc.		Credo
Permits		Credo, architect, council of Eindhoven	Credo

Building preparation	Working drawings	Credo, architect, structural engineer, consultants (installation and logistic), contractor	Contractor
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