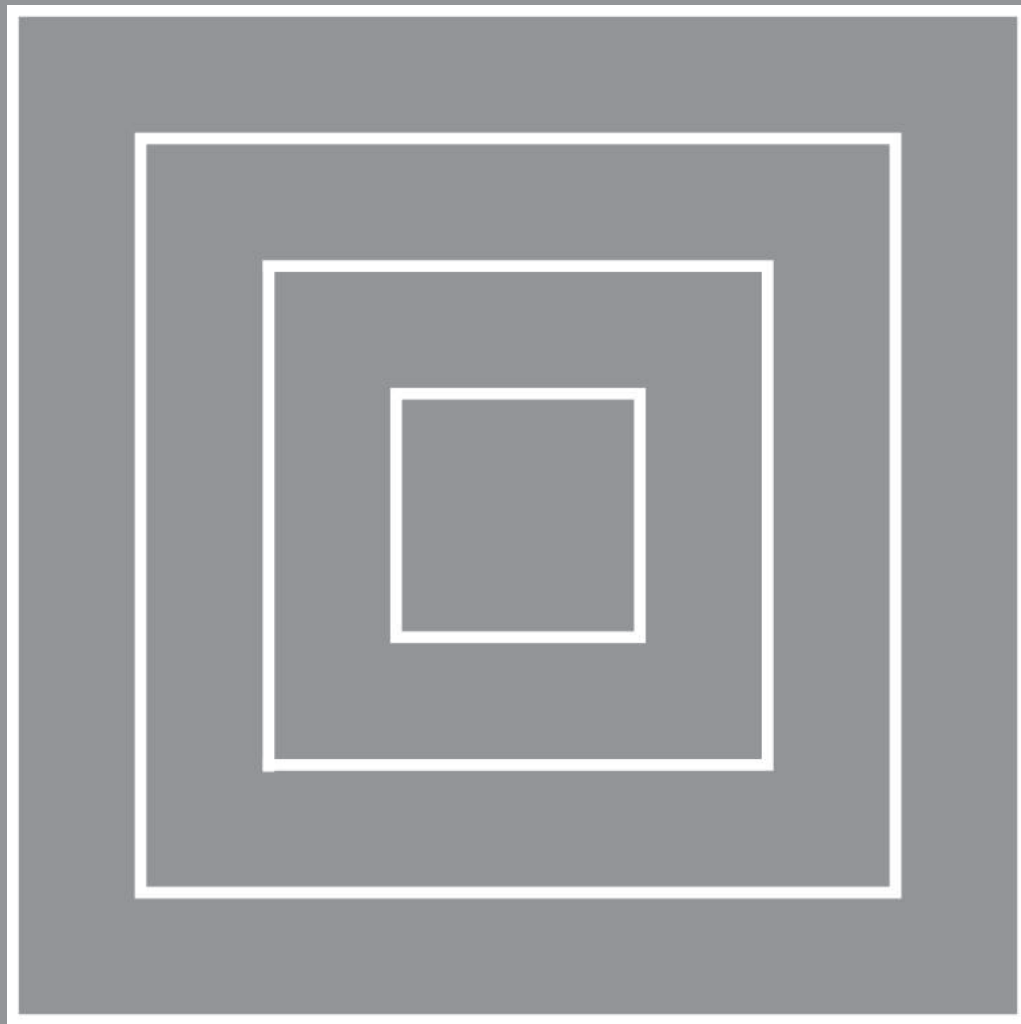# STUDY BY DESIGN

H STUDY BY DESIGN

Design research as discussed in Chapter 10 concerns determined designed objects within determined historical contexts. Design study in the preceding section considers the actual context, the location and the commission for the time being determined as well, but the object is variable because it has to be designed.

But, as we all know, context is always differing, changing and could even be object of design as well on a higher level of scale. Research on different locations and historical periods produces types (Typological research as discussed in Chapter 12) as long as we find object constancies. Sometimes we do not. Considerable experience has been gained in forms of study where the object or context is fixed by typological research or design study. If both context and object are variable (study by design), an alteration of typological research and design study can be resorted to. In this the object and the context are alternately varied. However, it is not inconceivable that this research can hold its own unaided by these two research methods.

Types of study by design
Van der Voordt and De Jong try to find some classifications of study by design. They do not choose but give some examples to find a scientific direction at last.

Designing Naturalis in a changing context
When the location changes during the design process, as happened designing Naturalis by Verheijen (see page 459), the type of building and even the programme of requirements may change as well. How do we study a variable object in a variable managerial, cultural, economical, technical, ecological and mass-space-time context? That means also, that goals out of that context are shifting. The study becomes more means-orientated and less determined by assumed goals.

488 Changing the location of Naturalis from downtown Leiden into the edge of the old city

Designing a building for art and culture
Röling, Van Eldijk and Van Kan describe the design process of an experienced and socially involved architect with great sensitivity for changing contexts

Contemplations for Copenhagen
Van den Bergh describes the development of a design without a programme of requirements. That brings him back to the very roots of the discipline of design, the ancient sources of our culture.

Learning from The Bridge project
The Faculty of Architecture TU Delft three times bore witness to an experiment, organised by Breen arousing scientific discussion by exhibiting the results of the last two in the main hall of the Institute. With a very strict, but limited programme of requirements in 1993 he asked approximately three hundred students to make a high quality model of a table at scale 1:5. In 1996 he did it again requiring a bench and in 1999 a footbridge at scale 1:20. Three beautiful publications describe the experiments and publish a selection of the results. The scientific community became increasingly fascinated by the combinatory explosion of solutions within a strict, but limited programme of requirements, culminating in the bridge exposition. The programme of requirements and the exhibition did not contain contextual data. The visitors to the exhibition had to imagine different contexts themselves when observing each bridge. So, object and context both varied, meeting the definition of 'study by design' in

this book. In the Chapter '*Learning from the bridge project*' Breen describes his own perception of the experiment.

Creating non-orthogonal architecture and design in strategy

Vollers' and Frieling's study are the first indications of systematic study by design. Vollers proceeds from the desing resources opened up by the use of CAD to give form to potential objects and applicable contexts. Frieling's basic premise is a dynamic public deliberation between projects on a small scale (objects), and perspectives on a large scale (contexts) in connection with the decision-making on the Delta Metropolis.

Conclusion

Graduation projects, in which the students are allowed to determine context and object themselves, present an archive of more and less successful experiments in the field of study by design. However, this archive is not yet sufficiently documented and updated, or accessible for scientific study (http://iaai.bk.tudelft.nl). Such an effort is necessary to find enough comparable examples for design research. Design research supports our most challenging effort, to bring study by design on a scientific level.

50 TYPES OF STUDY BY DESIGN

THEO VAN DER VOORDT
TAEKE DE JONG

50.1   TYPOLOGY OF STUDY BY DESIGN

In this book study by design – also called research by or through design – is defined as the development of knowledge by designing, studying the effects of this design, changing the design itself or its context, and studying the effects of the transformations. The 'TOTE-model' from systems analysis may be recognised in this : Test → Operate → Test → Exit. Methodologically this should be preceded by a pre-design study, particularly in order to ascertain which requirements should be met by the design; although a design does not need to be goal-directed by definition.

'Means-orientated designing' is rather a journey of exploration, in search for unknown design solutions for goals yet unknown when the goal-generating context changes. In it the figure *'homo ludens'* fits, trying out things by playing. Means-orientated study by design in its pure form will occur rather infrequently. Who searches, always searches for something catering for a need. So there is minimally a latent idea of the results aimed at, for instance a higher experiential value, lower cost or better insight into the potentials of an existing area. An example is the doctoral study of Vollers (see Chapter 55) where, whilst designing, new and exciting forms of building façades have been developed. Means-orientated as well as goal-orientated study by design tries to generate insight into the relation between goals and means of design.

Next to the distinction in goal-orientated and means-orientated study by design, study by design may be cassified according to the degree in which object and context (in space, time, programme and boundary conditions) are constant or variable.

a. The object varies and the context follows. This is the case when a design intervention is made (under constant circumstances otherwise) in order to study its consequences on, for example, perceptual qualities, aesthetics and context, like in the design studies for the *'Kop van Zuid'* in Rotterdam, in order to introduce the programmatic and formal potential of that area.
b. The context varies and the object follows. An example is the positioning of the same design on a different location, in order to study the effects of the urban architectural or cultural context on the design and vice-versa (see for instance Röling's contribution, Chapter 52). Another example is provided by the changing of the requirements a design should meet, or of the weight given to the individual requirements. The subject of study is then which interventions in the design are desirable in order to acknowledge these new requirements.
c. The object as well as the context are manipulated, by changing an existing design and study the effects in different contexts.
d. A variant is that also the actors in the context vary. This applies, for instance, when a designer takes a design from another designer for point of departure and explores new possibilities by transformations in this design, generating different effects.

Another variable to classify study by design is the factor time (figure 489). Designing followed by research may take place chronologically (transformations in the design and analyses of effects on the context take over from one another) as well as synchronously (during the same period different design variants are subjected tot comparative analysis). Put differently: design variants may be developed sequentially or in parallel fashion. An example of the latter is an analysis of the contributions to a design contest. It also happens that the analysis of design variants occurs only after a sequence of design variants in the course of time. This way Frieden[a] studied a sequence of designs for Horton Plaza in San Diego, California. Due to
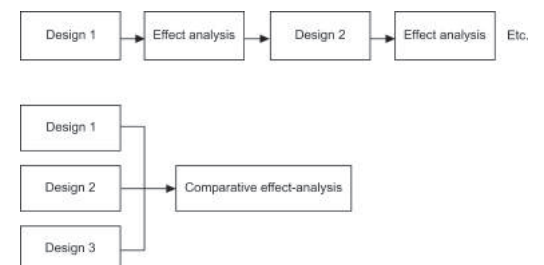
489 Chronological versus synchronous study by design

a   Frieden, B.J. (2000) *Changing plans in midstream, a strategy for design innovation*, p. 109.

a lot of causes the plan preparation resulted in significant delay. Between the initiative and inauguration some 11 years passed into history. Since the requirements and the boundary conditions changed several times markedly (different norms for parking, different opinions about retail centres) nine different designs were made in the course of time. The comparative plan-analysis of Frieden is strictly speaking to be classified as design study. But, analysing the step-by-step changes in design and negotiations about design revisions comes close to 'study by design'.

A final variable to be mentioned, in which studies by design distinguish themselves mutually, is the kind of effect analysis. Design variants may be studied 'on paper', as well as in reality, by studying the effects in a full-scale mock-up or following realisation of the design.

Summarising study by design can be classified as to orientation on goal, or means; and the degree in which the following factors are constant or variable:

- the object (design);
- the context apart from actors (location, performance criteria, pre-requisites, legislation);
- actors involved (designer, client, researcher);
- time (moment of designing and effect analysis);
- way of testing (theoretical, experimental, Post-Occupancy Evaluation).

When study by design is orientated primarily on generating knowledge and insight we can rightfully speak about a study. If optimising a spatial solution is the first aim, it is a case, actually, of product development.

50.2   PROTOTYPE DESIGN

The development of prototypes involves both elements of study by design and product development. It includes a sequence of designing – testing – re-designing - and so on, until an optimal solution has been achieved. However, contrary to mass-production of consumer goods, a prototype design of a school, a health centre or whatever can not be reproduced regardless of its context. Most often the urban context, client's preferences and the number and characteristics of the users will differ from place to place. Still a prototype design may be used as a model needing only slight adaptations to local circumstances. As such, lessons learned from ex post evaluation may be used in continuous design improvement. For examples of prototype design including ex ante and ex post design research we refer to Chapter 20.

50.3   EXPERIMENTAL DESIGN

In order to conduct a technical experiment that aims at context-independent results, a test object (model) must be designed that meets certain specifications. A test model, however, does not have to meet the context-linked schedule of demands that it would actually be exposed to in reality, though the context of the experiment has its own requirements (experimental design). A good example of this kind of study by design is a wind-tunnel study that has to cover various constellations of a neighbourhood in order to expose the parameters that determine how energy is lost as a result of wind in various contexts.[a] The required local designs were re-created in circular models of three metres in diametre and tested in the wind tunnel.

50.4   DESIGN RE-CONSTRUCTION

Sometimes design research calls for a design re-construction in order to be able to compare a certain design with others. Thus 25 various plans for the Randstad were compared.[b] The basic materials could not be compared due to different planning horizons, different residential capacities, and different ways of creating the legend. The designs were then redrawn using the same legend.

This phase encompassed "interpretation" of the plans. The design of the legend formed a separate problem, since a legend in which the lions' share of the plans can be expressed by

a   Jong, T.M. de (1978) *Wind Weren*.
b   Jong, T.M. de and J. Achterberg (1996) *25 plannen voor de Randstad*.

some of the plans was insufficient. A continuous adjustment of this legend (in order for it to also include the plans) again demanded a re-interpretation of plans already interpreted in the old legend, only now in the new one. When all plans had finally been included in a single legend, the interpretation was presented to the designers.

The adaptation of the legend led to a reduction that did not satisfy all designers. In many plans, key details were omitted so that the 'soul' of the plan was considered lost. This had not only to do with omitted topographical, context-linked details, but also with solutions essentially useable in the other plans as well, in another context. These details were thus not important for the comparison of the plans on the scale that the comparison involved.

After the interpretation came interpolation and extrapolation of the plans. One plan was made with 5 million people in mind, while the other had taken into account only 0.2 million people. Each plan with a capacity too small for the comparison therefore had to be expanded into a plan that would theoretically include 1 million people. For the plans with large capacity, a theoretical phasing-down was made in order to compare the plans' phases at which the plan capacity for 1 million was reached. Both treatments of the plans are forms of study by design in regard to plan comparison (design research).

50.5 SCENARIO DESIGN

A scenario does not only contain the extension of empirically established probable developments perspective, but also the unexpected policy interventions and possible spatial interventions. When developing scenarios so as to have different conceivable contexts at hand for the decision-making process, these possible spatial compositions need to be designed. In preparation for the Netherlands' Fifth National Policy Document on Spatial Planning, four such 'perspectives' were made:[a] Palette, Stream Land, Park Land and Urban Land. These scenarios each contain, aside from different forms of policy and empirical pre-suppositions, a spatial image as well (possible design).

50.6 LEAVING OUT PRE-SUPPOSITIONS

At the Faculty of Architecture in Delft, Zwarts presented a constructive design assignment for a steel building *in* a hall. Thus there was no need to take into account the climate, which meant that radically deviant details and additions could be made to the exterior surface. In this process, the influence of the climate on traditional detailing became clear.

Weeber did something similar by formulating an assignment for a building for a border crossing on a site where it was always a rainy 28ºC.[c] The people on one side of the border were also twice as big as those on the other side. Hertzberger calls for 'impossible assignments' in education as well, such as a house without any view atop a flat building.[d] With these kinds of assignments, the student is forced to abandon 'self-evident pre-suppositions'; a condition for creativity. Culture is the accumulation of unspoken pre-suppositions in the process of communication. Thus in early-classical Greece, mythical pre-suppositions regarding the creation and the working of the world were of course part of the explanation. Trade confronted the Greeks with other cultures. Thales of Milete was the first person to relativize the mythical pre-suppositions (doubt) on the basis of what he perceived. The revival of arts and sciences in classical antiquity testifies to the value of raising unspoken pre-suppositions.

Palette

Stream Land

490 Two out of four perspectives, see also page 496.[b]

a   In this book, the word "perspective" is meant more in the sense of "probable future" than the scenario meant here as "possible future".

b   This interpretation is derived from Jong, T.M. de and M. Paasman (1998) *Een vocabulaire voor besluitvorming over de kaart van Nederland*.

c   Smienk, G. and J. Niemeijer (2000) *De hand van de Meester*.

d   Hertzberger, H. (1999) *De ruimte van de architect: lessen in architectuur 2*, p. 28. English translation: (2000) *Space and the architect: lessons in architecture 2*.

51 DESIGNING NATURALIS IN A CHANGING CONTEXT

FONS VERHEIJEN
JOB VAN ELDIJK
LENNEKE VAN KAN

51.1 INTRODUCTION

This is the report of a design process of Fons Verheijen. The report describes the design for the Naturalis Museum for natural history in the city of Leiden. Each illustration is indicating an important step in the design process.

Two things are important to me during the beginning of the design process: the programme of requirements and the context in terms of urban architecture. I do a lot of thinking about the programme of requirements; making calculations while manipulating the numbers. I want to get the programme of requirements completely in my head: numbers, relations and square metres. The context in terms of urban architecture is studied on its material and immaterial boundary conditions. In the case of Naturalis this was particularly important, since the entire area was still lacking order. The Leiden municipality had a global plan for the area, but no further detailing.

When this first ordering is ready, the second stage starts: the sketched design. The programme of requirements does not bring me far: so much is clear when I talk to the commissioner. Often, the commissioner is someone without a lot of knowledge of building; so he can not make his wishes clear in an unambiguous way. Usually, he does not know himself as yet what he really wants. He will always present concrete pictures. I consider it to be the task of the architect to watch out during an interview for immaterial things the commissioner is saying unintentionally. The architect is making the concrete pictures of the commissioner abstract and gives them then his own form. I enjoy finding oppositions, since they are leading usually to innovative solutions. In the case of Naturalis I had to do with professional commissioners.

One of the first things I do, is to make an urban model and exercise on it with the programme of requirements. Usually there are a lot of wishes, proceeded from the context in terms of urban architecture and from the interviews with the commissioner. This can all be put in a drawing, but this drawing is then much too full and too rich; but this will get alright during the next stage, the stage of reduction. Reducing is a wonderful process. It is the slow removal of all that is superfluous, while maintaining the essentials of the requirements, wishes and thoughts that have been drawn. At some moment, all of a sudden a very beautiful structure is then coming to the fore. This requires that one should be drawing shamelessly. It means drawing endlessly, without any regard for beauty. Only when you are drawing something do you see whether something is wrong somewhere.

In this project the commissioner had as yet no concept of the exhibits in the building. The design of the building and the design of the exhibition went hand in hand. Therefore, communication with the commissioner was very important. By making very many models and many simple drawings it was attempted to create as many pictures as possible on which the discussion (and so the design) could go on. I never reject a first idea totally. It is always further embroidered upon. The date on which the sketched design should be ready is fixed. On the moment you are filing it, you think your design to be the work of genius. Later you think it a mess. However, it is a necessary step in getting on; for the commissioner as well as for the architect. Usually the sketched design is, as yet, less than perfect. After a while, all of a sudden discoveries are emerging. In this project there has been a number of these clairvoyant moments giving the feeling that everything was inter-locking together. Now it is a matter of erasing and making things more simple; with occasionally a sound solution for something only your subconscious self knew to be less than perfect. At a given moment in time the final

design must be ready. In the design process as a whole this is a moment selected at random. You are working towards it; but you could have been designing much longer; or perhaps even better (what should not be the case ideally).

The final design is the 'concept'; now further work must be done on the details. These detail sketches are crucial. Bad detailing may ruin a good concept completely. Detailing is a feast. Everything ends up alright. A building will become a good building if the concept is carried into the details. So in this process there have been several 'final' designs. Also during this stage it is of great importance to try out all solutions in models and to preserve good communications with the commissioner.

Next to the commissioner there are many more people to reckon with during the process. For sticking to your building you have to talk endlessly. For bolstering your story you will be needing a lot of visuals: models of all kinds, but also things like cartoons and very simple pictures.

51.2 DESIGN PROCESS
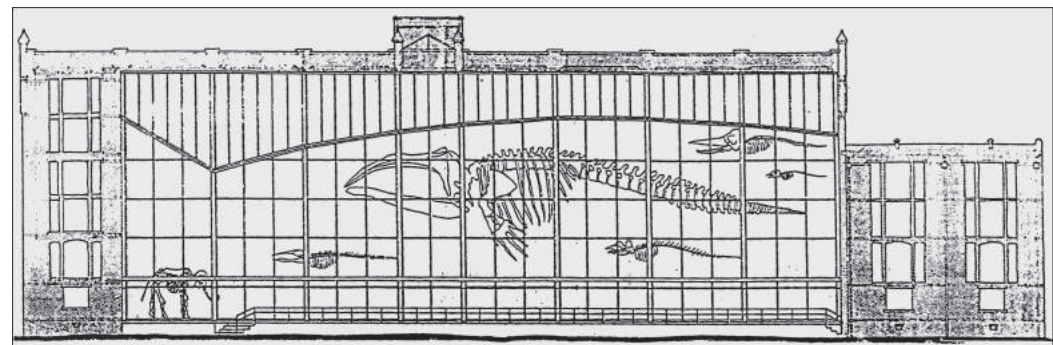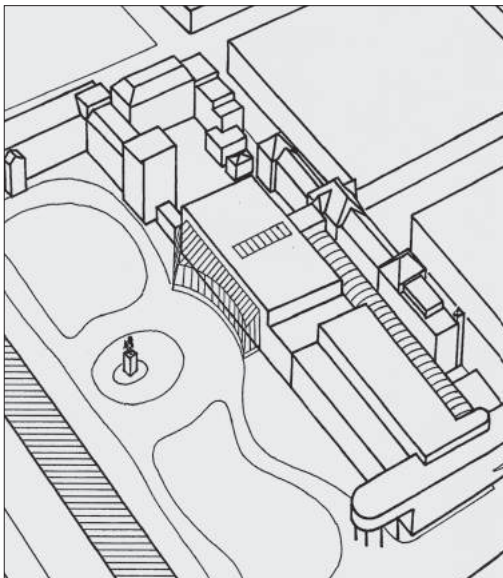
491 First idea

When I had restored and modernised the monumental *'Droge Magazijn'* (1911) of the NNM, the National Museum of Natural History in Leiden, I was given the commission of the national buildings service to make a master plan with variants for the combinations and the extension of the museum buildings. Part of it was a glasshouse for storing (and exhibiting) large skeletons.
The illustrations above are a spatial drawing of the existing building with a new glasshouse and the idea of a whale floating in the air in the glasshouse that can be seen from the Van de Werff Park in Leiden.

492 Twin-city vision for Leiden

There was no exhibition space included in this museum; it was a museum of just two functions: housing a collection of conserved animals and scientific study. The 'Plague House' in Leiden was ear-marked as the location for the new exhibition space. In olden days this Plague House was standing completely apart from the city. Now, it is starting to become totally surrounded by new buildings. For that part of Leiden no urban plan existed; there was just the idea of the twin-city. With the railway station for a centre, a new city should come into existence, next to the historical inner city. Now it was the idea to add new building to the Plague House, so that both other functions could also move to this location, transforming Naturalis into one whole.
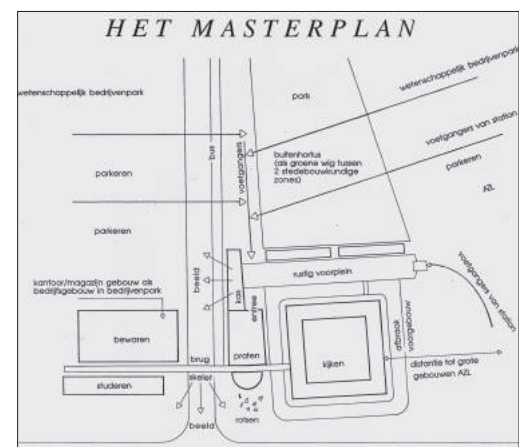
*493 Blueprint of the new building*
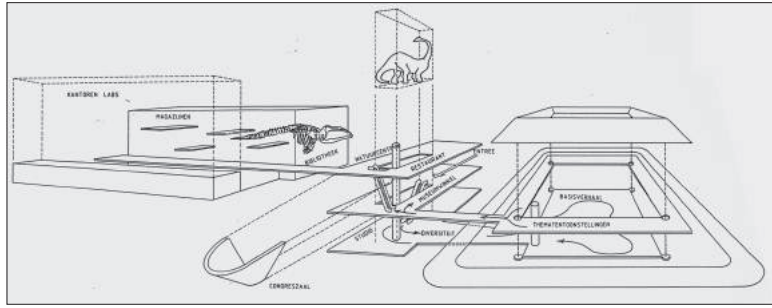
494 Spatial drawing of the new building; in it an idea for the exhibition

It was important for the new building that the new museum would get three functions: science, collection and exhibition. All three should be accommodated well in the new building. Because of conservation problems, it was decided that the old Plague House would not house collection or exhibition. Finally it was decided to go for a new building.


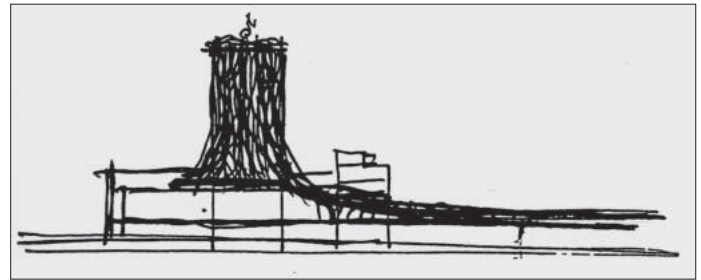*495 Workshop: all together around the model*
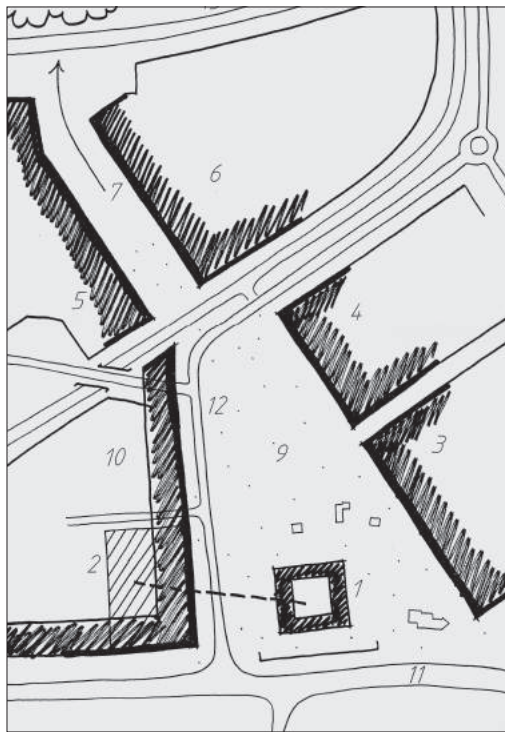
496 Urban plan

These illustrations show the plan in terms of urban architecture for leaving the Plague House area open. The museum park is also the park for the 'new city'. Form was given to this by way of a workshop with a model.

The analysis of the urban architecture resulted in the idea that the Plague House should be standing on its own with a park surrounding it. The new building would line up with the blueprint for the city.
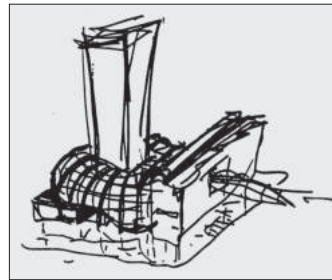

*497 Tower in the middle of the building*   *498 Through the scientific department to the collection in the tower.*

The idea emerged to house the collection in a proud tower. The workshop did also show that the Plague House would also stand out better by a tower on that spot. Spatially it looked as follows: via the scientific department one arrives at the collection in the tower. The exhibition is embracing this. I made these sketches during a holiday.
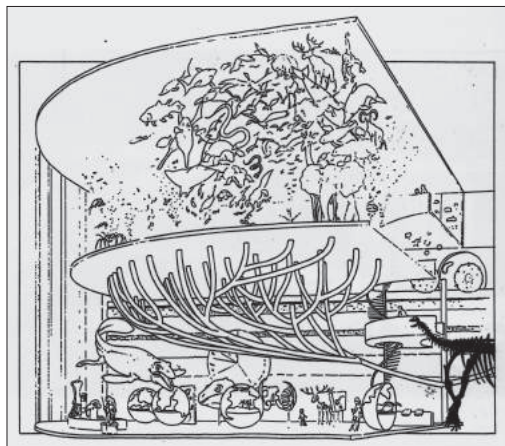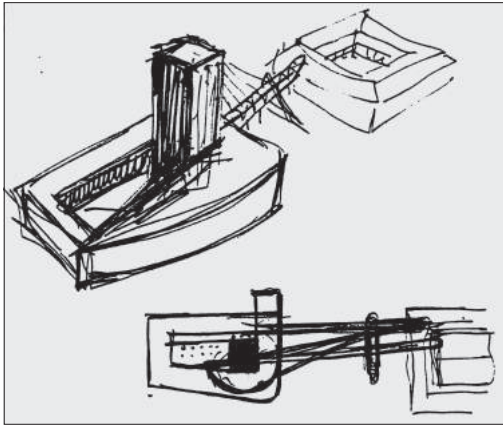

499 Exhibition concept

With the help of this picture biologists tried to explain their ideas on the exhibition.
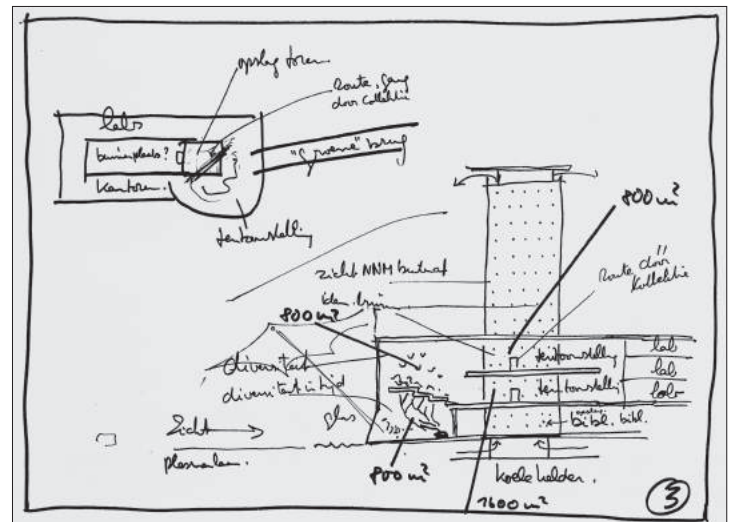
*500 Aerial view and vertical cross-section*

501 3D image and aerial view

Adaptation of the picture given by the biologists to the building thought out so far.

502 Test of form

This illustration represents the further working out of an idea. The major part of the idea survives: the passing through the scientific department and the exhibition space behind it, although the last two rooms have become square ones now.
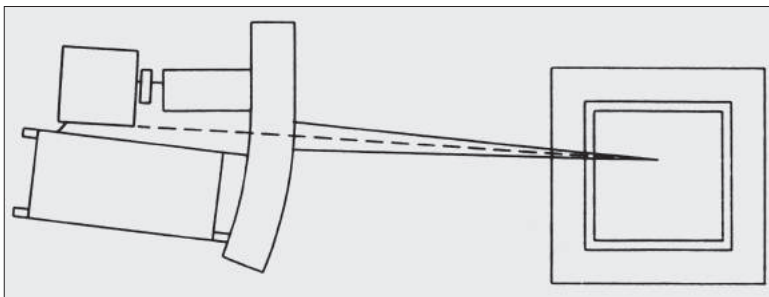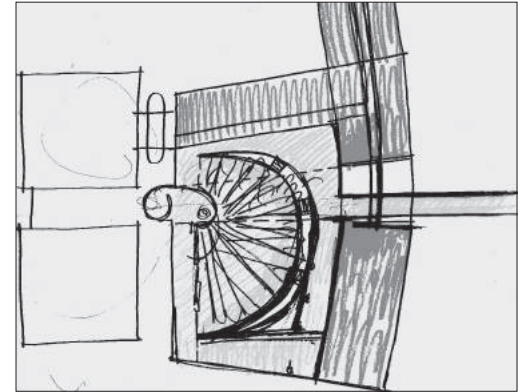
503 Blueprint

The spatial drawings indicate the spaces for the exhibition. They should be kneaded further. For the museum it now became serious to come with an exhibition concept.
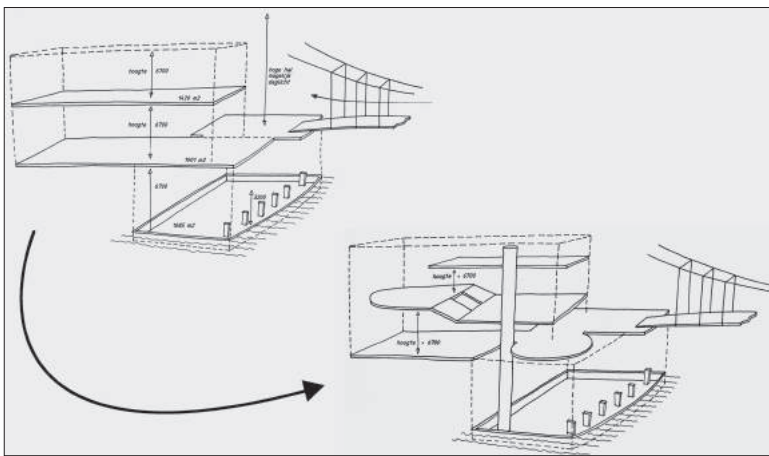
504 Blueprint from the sketched design
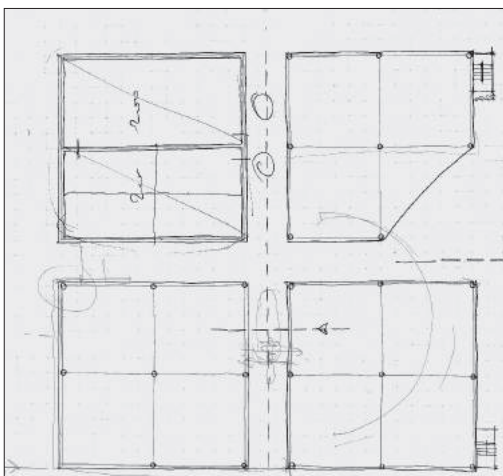
505 Timelessness

The director of the museum opposed casting the exhibition concept in stone for the building. Exhibition concepts do change in time and the building should be capable to adapt to changes like that. Finally, all wishes and ideas melted into a clear schema. The drawing represents the final stage, the last reduction: the square top-right is done simply rectangular; the diagonal is crossed out.
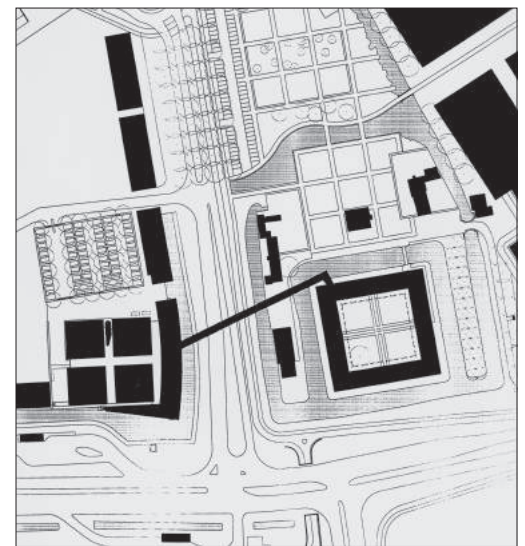
506 Urban plan
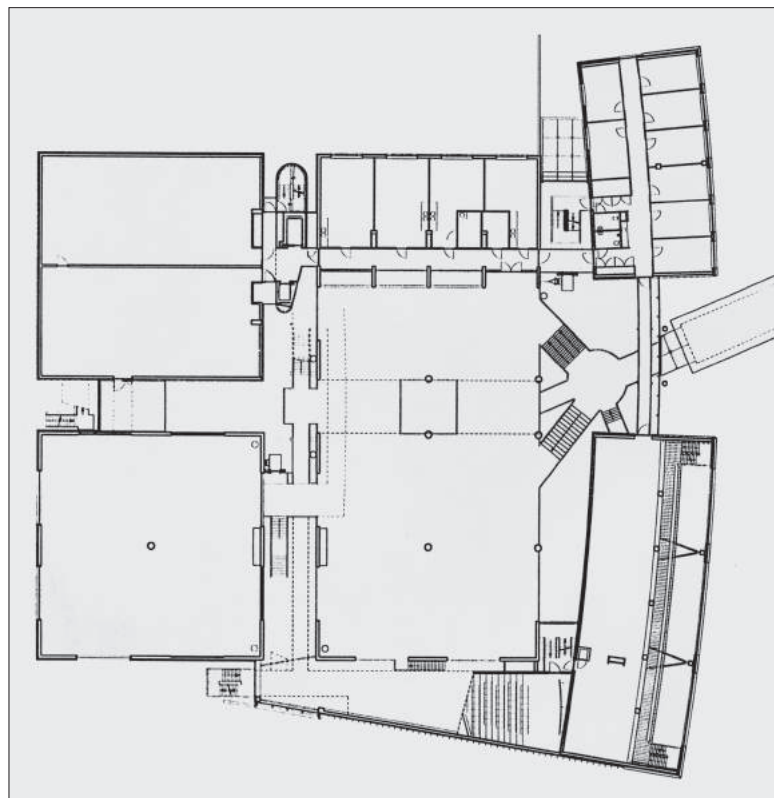
507 Blueprint final design

After quite an odyssey, the grid of four squares that emerged proved to match with the structure of the Plague House.
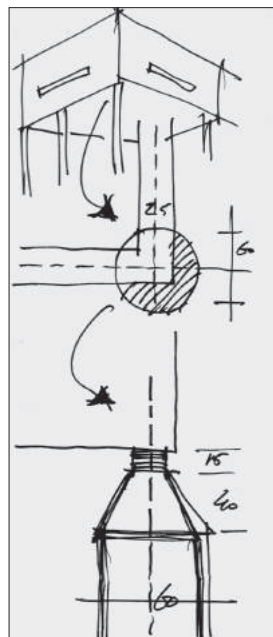
508 Design sketch of the column

509 Final result

One out of many detailing aspects: the column. The engineer calculated a column with a thickness of 60 cm. Connecting it to a wall 25 cm thick presented a problem. The solution (point of a pencil) was yielding a strengthening of the concept (floating box).

510 Photographs of the final result

The building is still standing out, but will become part of the urban landscape.

511 The image of the skeleton of the whale proves to be a constant during the design process.

51.2 LOOKING BACK

Golden moment

The simplifying of the blueprint, the way in which the zebra crossing's bridge touches the Plague House, the astronaut's suit idea for the climatic requirements within the tower and the snake's skin of the tower were the golden moments.

Impact colleagues

Particularly with connection to the models and the detailing my colleagues had significant impact on the work.

Requirement not linked to concept

A requirement not linked to the concept is that the museum is comprising three parts, not just the exhibition building. Architecturally many museums have exclusively the look of an exhibition building. In the case of Naturalis I did not want to make the elements already existing for 175 years: a scientific institute of repute and a phenomenal collection, marginal in order to glorify the exhibition department. I wanted to combine all three elements making a museum into a museum on an equal footing.

Impact of budget

The commission was characterised by high ambitions and low budgets; it was alluded to as a 'social housing museum'. However, half of the programme of requirements was earmarked for storing the collection, with a great sum budget-wise for temperature control, since the scientific collection is containing predominantly organic materials. By not conditioning the storage in the tower (20.000 m^3), but in the inner skin of the outside wall (200 m^3) a significant part of the budget could be transferred to the rest of the building.

Interface with the builders

For the tower clever constructions were devised: 2 x 4 social housing modules per floor.

Interface with the constructor

I think the architect should make the construction; the constructor is coaching and calculating. Understanding the principles of applied mechanics is giving the designer wings. Working a concept through into details may strengthen the concept unexpectedly. If one is a full sparring partner to the constructor, the construction can be managed; as in the case of the concrete beams under the scientific wing: I could halve them, with many fewer steel diagonals, by convincing the constructor of the merits of a different stability principle.

Significant transformation

The design process took its largest and highest flight during the intensive co-operation with the Director and the Faculty of Biology staff when the designing for the building went hand in hand with the exhibition concept. This design adventure resulted in the quadratic structure with the tower for one of the quadrants and in the split-level accumulation of the exhibition space: an unambiguous clear structure, in which the visitor may freely roam through the building in several ways, while keeping a birds eye view of the space as a whole without constraint.

Post scriptum

In a search process the moments of euphoria are delightful. Discussing the design with other people will sharpen one's concept. Responsibility for the design decisions; not just one's personal infatuation.

52 DESIGNING A BUILDING FOR ART AND CULTURE

WIEK RÖLING
JOB VAN ELDIJK
LENNEKE VAN KAN

This is the report of a design process of Wiek Röling. The report describes the design for a centre for arts and culture in the city of Velsen. Each illustration indicates an important step in the design process.

52.1 INTRODUCTION

The first spark for this project was struck eight years ago. Evert Jan Meijer, member of the governing board of the theatre group Amsterdam, Chairman of the *'Witte Theater'* in Velsen, and building contractor as well, asked me to build something for him. That commission came to nought, but a comparable one in Velsen resulted.

The existing theatre in Velsen is at odds with the availability of space. The building was constructed in the thirties as a home for clubs and as a cinema (REX). It was changed in 1954 by Bijvoet, who added an auditorium, and between 1988 and 1990 it was extended by the city architect of Velzen – with a lounge and a theatre house. The whole did not function as yet, but money for further improvements was lacking.

There are three more institutes in Velsen with housing problems: the *Witte Theater (the "White Theatre")*, housed in an old storage space for life-boats (the theatre wants a cinema room; furthermore the municipality has another destination for the location. Meijer saw a connection between the two); then there is a creativity centre in Velsen, an amateur academy of arts (this centre is housed in a school-building beyond its prime; in an area that will also be used for something else.); and finally there is a set-dressing workshop of set-dressing hobbyists fighting lack of space (a room free of dust is needed for painting), maintenance problems and a changed destination plan. Meijer saw that these four institutes might fit within one building: a Centre for Arts & Culture Velsen.

The four parties and their wishes itemised:

- *Theater Velsen*; wants a better lounge and a 'grand café', a restaurant and a rehearsing room.
- *Witte Theater*; is pleased with its present small auditorium, but would like to have a cinema. In addition the delivery of stage props is very good; the new situation should at least match it. The distinct identity of the theatre is sacred. It should be possible to organise pop-concerts with a lot of noise; that audience not mixing with the more sedate theatre audience.
- Creativity Centre Velsen; must move to a different site because of the destination plan. In addition the maintenance costs of the present building are too high. They are contented with the spaces they've got now, excepting some smaller adjustments.
- Set-dressing Workshop Velsen; is lacking a dust-free painting workshop. Like the Creativity Centre, the painting workshop is now occupying a spot in the city's centre for which the municipality has different plans; and there are maintenance problems as well. There is an additional requirement: storage for the collecting boxes of a national charity.

I received the commission to study the question, whether the programmes of the four institutes could be combined in one building. It is logical to select for the location the area surrounding the existing theatre. It features the largest auditorium, there are 900 parking lots available at the soccer stadium of Telstar, next to it, and it is fairly accessible by cars and public transportation.

Meijer initiated a Foundation that would act as the commissioner. The Municipality and the Province (North-Holland) should also help to finance the project. The *Witte Theater* rather wanted that this commission should go to architect Crouwel. However, the parties could not come to terms in financial conditions. I was proposed by Meijer in March of the year 2000. I got a commission for making a sketched design; a model, cross-sections and floor plans, plus an estimate of costing.

52.2 DESIGN PROCESS
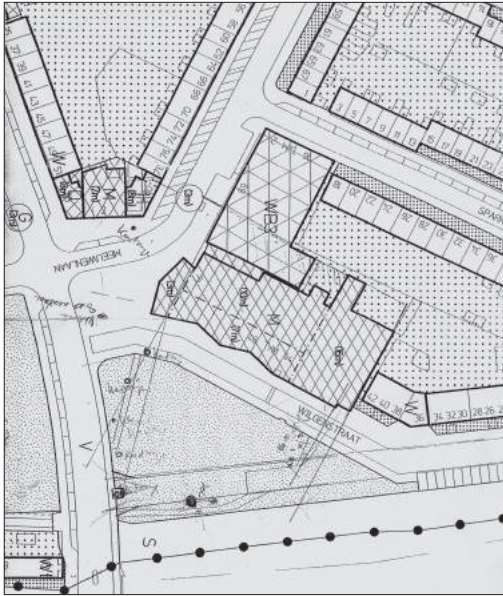
512 Visit location

As I am wont to do for each design, I visited the location first. I have been there some dozen of times. The first time I indicated on the map the positions of trees and important visual lines.
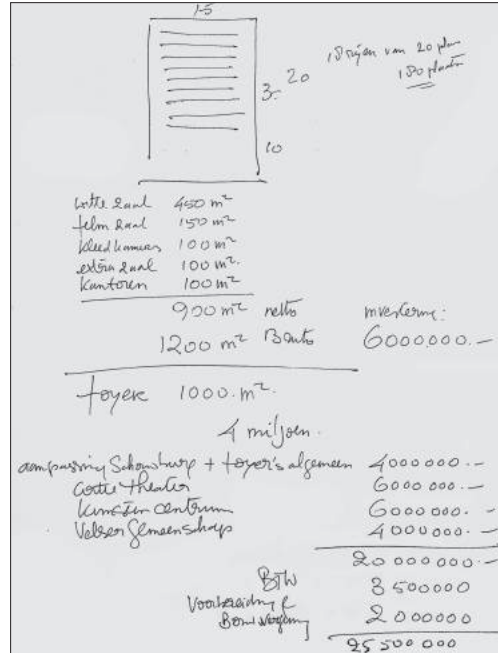
513 Costing calculation

A first global costing calculation; just to see whether it is possible to put there a new building at all.

514 Programme of Requirements

I study the programme of requirements and verify it by attending the theatre performances and visiting the workshops. In this way I am learning the programme of requirements by heart. I am making notes, small drawings (without scale, 3D, floor plan, cross-section), calculations, while conducting small studies in ordering.
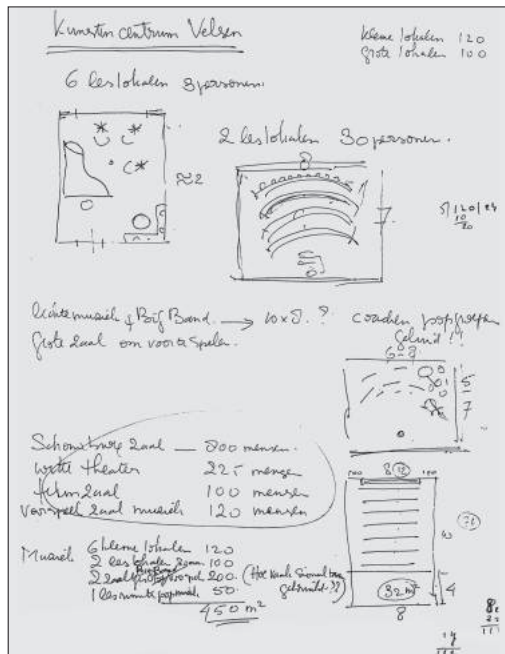
515 Interviews

I interview users and observe their behaviour in order to see whether they have been asking too little or too much in the programme of requirements. Often one is too forgetful about what is existing, while emphasising too much what is lacking. It is important 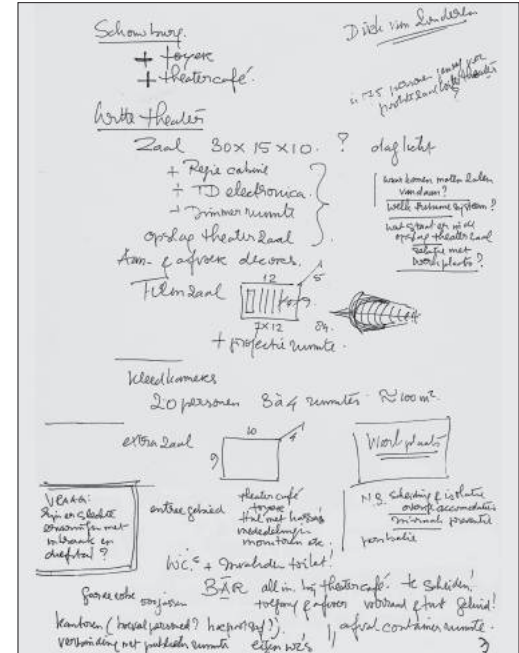that the programme of requirements should be written in accordance with function and intention, not solely in terms of surfaces.
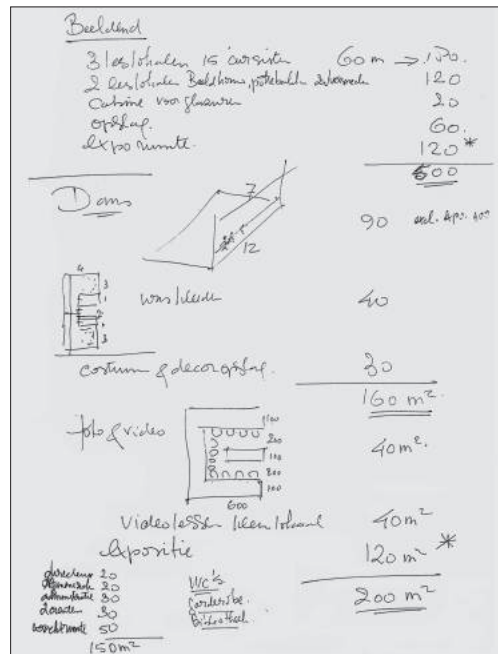
516 Experiencing

Experiencing wishes and the existing is important; if I design a house, I usually ask the principal whether I can stay over for a weekend. The design sketches are made in a fresh A4 notebook, squarely ruled, with pencil and pen, by hand.

517 Northern light

It is great luck to be able to put the set-dressing workshop and the new painting loft to the northern side of the building. Usually this side of the building is less useful, but these spaces can make good use of the favourable light from the north.

518 Surfaces

As a start I calculate the surfaces that should minimally be available.

519 Rectangles

All these spaces with minimal surfaces I draw as rectangles and fit them together in order to see, whether all wishes would fit into the situation. At the same time I make a cross-section occasionally to see which spaces might fit on top of one another.

520 Light

The beauty of walking from the shared entrance for the four institutes into the light was a point of departure. This may be realised by positioning the building within a square. However, that is not possible on the site. A light from above in the heart of the building may serve the same purpose. As soon as I had imagined this, the idea occurred of an exhibition space connecting the institutes. This is something I added myself to the programme of requirements as a connecting element between the institutes. It happened in a split second and it became the guiding motive for the design.

521 Café Warmerdam

During a guided tour in the Theatre in The Hague I saw Café Wasserman, a part of that theatre. I had great difficulty with the former residence of the caretaker of the theatre in Velsen, Mister Warmerdam; and with the lounge of the theatre. In an analogy with Café Wasserman in The Hague I invented Café Warmerdam in Velsen. The example of the theatre in The Hague was the inspiration of my design intervention.
(Wasserman was a famous actress; Warmerdam is a famous now living 'actor's family' known for their movies and house 'Orkater'. The brothers Warmerdam are the sons of the former property man (and occupant of the official residence) of 'REX'.)

522 Idea for cinema: below street level

It was an idea of Meijer (remaining from the commission of the Amsterdam Theatre Group) to build the *Witte Theater* in a sub-terranean way. However, the programme of requirements specified a wish for daylight in the auditorium. In addition this vast space was some ten metres high and it was an important requirement that loading and unloading of stage props and requisites should be done very simply.
So the idea of sub-terranean building was discarded quickly, but it seemed to be a good idea to make the entrance of the balcony on the main level and the entrance of the cinema on minus three metres. The operator room can be seen as the Cineac of Duiker in Amsterdam. In this way the wish for its own identity would also be honoured.

523 Adjustment

I adjusted the spatial and organisational structure to the context of the urban landscape and the existing theatre. The trees present were no problem; I preserved as many of them as I could and gave them space. However, the adaptation built in 1988 did pose a problem. I found out that this extension was clashing with the logic of the building. Each building has its own logic, its own consistency, its own laws. Everything I questioned in terms of functioning and fitting in the new approach proved to be a part of that adaptation.

524 Line of the façade

What I did take over, though, was the line of the façade of the new lounge. That became the basis for the orientation of the new building.
Now, that the organisation of the spaces, the traffic and the urban adjustment have been settled designing starts: the tuning of the lighting, the atrium, the expression of the mass of the building.


525 Exposition space

Up to now I am pleased with the accessibility, the organisation of the building, the connecting idea of the exposition space, lounge of the *Witte Theater*, entrance and in- and output.
I still want to give thought to the fact that the street is not accessible anymore for cars; and the volumes are still needing change.

526 Mayor & Aldermen

August 29, 2000 I visit Mayor and Aldermen with blueprint, cross-sections and façades.
I always make models in order to see whether there is a bottle-neck and how the form of the building happens to be and to improve the logic and "building" aspect of the design.
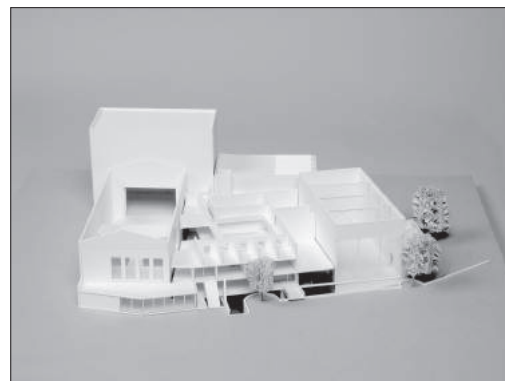
527 Photographs of the working model

51.3   LOOKING BACK

Start

Meijer has been commissioning me for years. Given previous experiences with him, it seemed appropriate not to begin before I had a commission. Nevertheless, I went immediately to the site to have a look; I always do.

Golden moment

A golden moment in this design is the intuition that for all forms of art collected in the building the visual arts can be a connecting factor. Other golden moments were the visit to the theatre in The Hague; the insight that I could use the exposition space as unifying element for the four parts; the example of Café Wasserman, seen during my tour in the theatre in The Hague, legitimising my making a suitable building in what is, after all, a true small-town environment.

Dead end

Up to now there has not been a dead end. In a flash I saw the solution. Actually, I always have that in all my projects. And I always come back to them.

Decisive constraints

I like to keep the existing building as classical as possible, I even try to give it more the looks of a classical theatre, so that it may be recognised as such. I want to give the *Witte Theater* the atmosphere of a real hall theatre (like theatres in factory halls). I want to give the four institutes their own identities with great emphasis. I do this by giving each institute its own entrance. In order to get a unity in spite of that, I want to make a central hall as well with a central box-office. In addition a space with visual art on a central spot can be a connecting principle. Another point of departure to me is that the building should be a hospitable one for 30 as well as for 2000 visitors at the same time. Finally, the façade should disclose something of what is behind it. However I want to give to the building a façade with the same handwriting.

Requirement not linked to the concept

I want to preserve as many trees as possible. I am also very happy with these trees in the design. I also want to bring the existing building closer to its original state. That means retracting from the change of 1988.

Indeterminacy in the design

I want to maintain the indeterminacy in the design as long as is possible; for instance in the height of the rooms.

Method

I do not work methodologically.

Budget

This is a study commission, based on a building costing 30 million.

Possible problems

Perhaps it is not acceptable that the road is vanishing; one of the partners may bow out; and the budget may get smaller.

Contact with commissioner

I have design meetings very regularly with the study group composed of representatives of all interested parties. I speak with people that have to do the work (stage manager, actors, cleaners etc.). Up to now I have already given six presentations. Everybody is very enthusi-

astic. That has also to do with the fact that everybody is seeing his wishes honoured. No-body had thought that four such different programmes could lead to such a consistent building.

The use of former research or research from third parties.
Of course I read a great deal. I try to follow the development in architecture by a subscription to four periodicals and I read very many books. The periodicals I read a lot are: *'Bouw', 'De Architect', 'Gezond bouwen en wonen', 'Duurzaam bouwen', 'Oase'* and foreign journals. For a specific commission one is going to read in a more directed way. For this commission I have read as an extra book: Ian Mackintosh, "*A Book on Theatre Building*". It is about history and contains advice. Of course books and magazines about acoustics make further reading. The periodical about theatre techniques especially was very interesting.

The influence of other people on my design.
In principle I strive for making every design decision myself to take care that the building receives a great consistency of thought. The influence of future users is great; beyond measurement. I keep on speaking with them until I understand what they want and make and change proposals until they are content or do not change them if I can persuade them that my proposals are better than their ideas. The installation advisor and particularly the construction advisor do have a great influence on my decisions, provided that their result pleases me. I want their advice as early as possible in the design process, so the building, not only concerning its use, but also the 'making', looks self-evident. (Logical building methods are often to be realised more easily and through that more economically.)

Iterative and more cyclic design process?
Alongside all attempts I do to rationalise my choices (analysis of the place, analysis of the methods of the making) to me the designing is an absolute intuitive, inimitable process. Very often I have a flash of the requested building at the first meeting with the commissioner. I see it, so to speak, before me and can 'walk' in it. The reality value of that image is often as unreal as buildings you dream of, in which rooms seem to lie logically near to each other. As soon as you think what the building looked like when you awake you discover that such a building can not exist at all.

During the work (finding out what the building should look like) the invented building appears continuously in my head. And, if the building is noted down and recorded, often very soon in the beginning of the design process, I continuously doubt whether this is, indeed, the best solution.

It happened to me once that I finished my design in a week, then for at least four months I tried out all kinds of alternatives, tested them to the analyses, discussed them with eventual commissioners and discovered at last that the best plan in my opinion very much resembled the plan of the first week. However, these months of wrestling with the right plan turned out to make the setting of functions and their relation to the construction more logical.

53 CONTEMPLATIONS FOR COPENHAGEN

WIM VAN DEN BERGH

The architectonic commission described here and its execution did not commence (in the usual way) with a programme, a piece of land and a budget within which an architect is asked to deliver a solution for a spatial-material problem. The problem was, that there was no 'problem'. Circumstances of a much different type applied. A commission like this makes one conscious of one's own professional conditioning.

53.1 INVITATION

In 1996 Copenhagen was declared cultural capital of Europe. Helle Juul and Flemming Frost had conceived of an opening exhibition that would be called *'Overlooking the City, Copenhagen as it is perceived'*. With this in mind, next to artists, film-directors etc. five foreign architects were invited: David Chipperfield, Enric Miralles, Thom Mayne of Morphosis, Hani Rashid of Asymptot and the author. The task we were presented with as architects was called *'The Cartography of the Pause – Architectural Visions for Copenhagen'*. There is a certain esoteric ring to this title and also the material accompanying the invitation did little to clarify the (architectonic) commission, to indicate the 'problem' or the question.

The commission as a whole however made a thoroughly professional, excellently produced and well-considered impression; sufficient to accept the invitation. The wooden cassette, built with sophistication, that contained the material, aroused already curiosity before its content could be inspected. The opening of this cassette displayed on the inside of the lid the invitation and the concept for the exhibition. The box itself contained, covered by a wooden plate engraved with numbers and lines, and perforated with sixteen quadratic holes, the following:

- a foil with UTM[a] gridlines;
- an aerial photograph of Copenhagen;
- a number of black and white maps showing the historical development of Copenhagen as a spatial-material fabric;
- and sixteen quadratic cuttings from an aerial photograph[b] with grouped around them for each cutting four photographic renderings of the respective directions of viewing from the intersection of the grid lines.
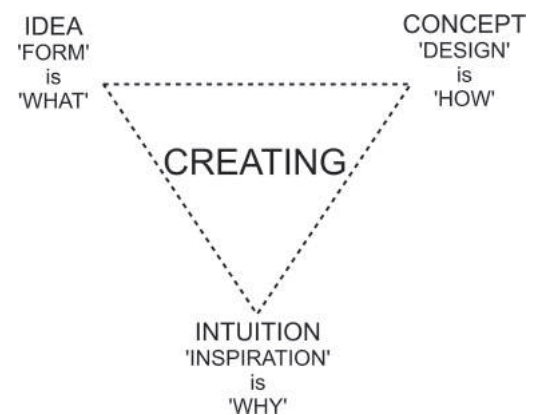
That had to suffice.

On a moment like that, one realises that – in contrast to the usual professional commission –a disciplinary commission is involved, in which architecture is interrogated as a (scholarly) discipline, as a way of thinking and acting: and by the same token of (spatial) designing.

53.2 BEGINNING

Additional scrutiny of the material also provided precious few hints to find the direction for a design. The task had to be interpreted and defined on the basis of the individual self; if something had to be designed at all. The 'problem' was the problem of creation itself, the question of the 'beginning'. The moment the 'what', 'why', and 'how' questions, fundamental to creating (or 'designing') come to the fore simultaneously.

The first choice made, the first step put into the direction of the unknown, can not be thought logically or rationally. The first step is – by definition – pre-conceptual. 'Creating' simply takes doing (and the courage needed for it): that is literally and figuratively the 'art', preceding all science and knowledge.

528 Creating

53.3   CONCRETISING FREEDOM

Creating is a form of spontaneity hovering on the edge of what is possible and what is real; on one side shunning a mode of randomness – in which everything is possible – on the other, a mode of absolute determinism; in which just one possibility finally remains. This freedom as creative imagination is therefore a form of spontaneity within structures and rules.

Merleau-Ponty terms this capability to generate a situation within which things become possible (and only because of it) 'concrete freedom'.[a] Usually it is a form of freedom emerging if one takes a certain distance to 'reality' and recognises that something like a 'playing-field' or 'space of the possible' does exist. In this case exactly the opposite applied. The 'playing-field of the possible' had to be restricted in an earlier stage in order to be able to come to the 'reality' of a design.

As in any design, the art is to design a 'game of creation'. In it, the 'act of designing' (as a process) is itself the playing of the game that creates something. Like poets are wont to, but architects as well – just think about the *oeuvre* of John Hejduk – I thus had to formulate for myself some rules (a structure) that could and should enable the 'game' of designing.

53.4   INTERPRETATION

My interpretation of the material and the title: *'The Cartography of the Pause'* boiled down to that it centred around the question to what extent the notion of place, as defined by the intersections of the U(niversal) T(ransversal) M(ercator) grid may be put into relation with the place in the urban fabric of Copenhagen.

My definition of the 'problem' (the commission) became endowing form to the relation between – on one side – a very precise abstract point – a (geometrical) 'place' as dictated by 'higher powers' 'top-down' ;and on the other side the concrete, spatio-material 'non-place': as witnessed on the projectionof this point in reality. This calls for instituting a (spatial) ordering linking the abstract (the 'higher') to the concrete (the 'earthly').

53.5   INAUGURATION

This is an old, and to architecture, fundamental 'problem', considering the two main reasons why the cultural phenomenon 'architecture' was invented at all. Architecture is on one side the predominantly physical protection against earthly 'nature'; on the other it is the pre-dominantly spiritual ordering of that same (but now a higher, so-called 'cultivated') 'nature'.

In whatever way we look at all cultural phenomena – be they architecture, language, legislation, manners and morals – they are always forms of ordering. They all order a certain kind of 'space'; or, in the perspective of Huizinga's phrasing[b], they define a 'playing-field'. In this regard this 'making into a place' of a 'non-place', this creation of an ordering of 'space' (and time) is a fundamental (architectonic) act. In antiquity it had its own (playing) field and (playing) time, its own ritual. Stonehenge, pyramids and temples, all of them (re)present a space-time ordering of this (higher) 'nature'.

It just happened I knew from Rykwert[c] the description of the ritual Etruscan and Roman priests – the 'Augurs' – performed in Antiquity in order to found a new city or temple. Founding means the making into a place of something that in space and time has no place as yet: literally 'inaugurating', instituting an order. In Rykwert's description of this ritual some points come to the fore displaying much affinity with the material I received from Copenhagen. It did not take too long for me to understand and to get the idea to introduce this ritual by way of a 'rule of the game' and to observe what it would yield towards a design.

a   Merleau-Ponty, M. (1962) *Phenomenology of perception*, p. 434-456. Originally published in French: (1945) *Phénoménologie de la perception*. Dutch translation: (1997) *Fenomenologie van de waarneming*.

b   Huizinga, J. (1952) *Homo ludens, proeve eener bepaling van het spel-element der cultuur*. English translation: (1980) *Homo ludens, a study of the play-element in culture*.

c   Rykwert, J. (1988) *The idea of a town: the anthropology of urban form in Rome, Italy and the ancient world*.

53.6   CONTEMPLATION

Transforming a 'non-place' into a 'place', commencing it to become part of the ordering of the 'space' (or the territory), as it comprises the grand total of all 'places', involved for the Romans an old and complex ritual, called *'contemplatio'*. This *contemplatio* consisted out of: the naming of 'signs', a 'circumscription' of the panorama as viewed by the Augur within

the *'templum'*, as well as contemplating, 'reading' and weighing (interpreting) the significance of the 'signs'. Our word 'temple' still refers to this concept 'templum'. Literally it stands for 'the defined open space within which the signs are read and interpreted'. The Latin *templum* goes back etymologically to the Indo-German stem *'tem'*, indicating cutting. As such it establishes a strong architectonic link to the 'cutting out' (in the sense of defining or de-termining) of a 'space' from the infinite, 'natural' space.

Much the same can be observed in the etymology of the enclosed sacred space of the Greeks of Antiquity, the so-called *'temenos'*, referring in a similar vein to the Greek verb *'temnein'*, also meaning cutting.

The temple is a cut-out space within which the signs become significant. According to Rykwert the specific elements of the ritual of this *contemplatio* were: *'conregio'*, *'conspicio'* and *'cortumio'*. In this the Augur proceeded as follows.

For the *conregio*[a] the Augur drew with his staff (the *'lituus'*) a diagram on the ground. In doing so he divided the space of the *templum* and determined as well the four main directions: east, south, west and north. At the same time he named the 'significant' elements in the landscape defining the *templum*, by way of pointing at them with his 'lituus'.

For the *conspicio*[b], conducted in parallel with the *conregio*, the Augur followed with his eyes the direction of the gestures of the other one. By looking around and gesturing he united the four separate *templa* of east, south, west and north into the whole space of the templum, defined and ordered now; subsequently he internalised them for the contemplation.

Next, he pronounced the *"legem dixit"* (the what the law says, or what the rule prescribes). This way he made a kind of covenant on the future, by indicating on what topic he made a prophetic statement and which omens or preceding 'tokens' were meaningful in this respect.

Finally the *cortumio*[c] ended the ritual of *contemplatio*, when the omens, signs or tokens were judged by the Augur according to the rules of his 'art and science'.

This ritual of the *contemplatio* got its name on the basis of the diagram, the pattern (or the 'template')[d] the Augur kept projecting on to space to order it. The (geo-metric) pattern of a square or a circle, with which he represented the defined (cut-out) space, with on top of that – starting from the middle - a cross, dividing the infinit space and as such ordering it in four directions: 'in front / east', right / south', 'behind / west' and 'left / north.

The combination and sequence of 'in front-right-behind-left' and 'east-south-west-north' I use deliberately here, since 'in front-right-behind-left' originate naturally from the upright human body; they are relative compared to 'above' and 'below'. However, the Augur – in seated position – created a 'fixed' ordering; in the largely horizontal space of the territory, by making use of the ('fixed') course of the sun, that made the space, with its 'fixed' ordering of above-below truly three-dimensional; if not four-dimensional.

53.7 CONTEMPLATIVE INTERPRETATION

Looking now to the material I received from Copenhagen, and particularly, to the cutouts taken from the aerial photograph, with the four views in the directions of the UTM grid lines, the ensemble actually embodies sixteen different *templa*.

One could say that one's task as an architect in this case may be regarded as the one of an Augur with the responsibility to 'contemplate'. To myself I regarded it in such a way that I was supposed to interpret the 'signs' that I could recognise in the several *templa* and to make a 'pronunciation' about them by way of a 'design'.

In any case, one has the feeling now to have come a bit closer to designing through this analogy with the ancient Etruscan-Roman ritual for founding a city; after all, this ritual did put on a wealth of architectonic forms,- just think of all the cities and temples built by old Etruscans and Romans.

a   The *'regio'* in *conregio* represents a direction and/ or border and refers in its turn to the Latin verb *'regere'*, meaning 'ruling, guiding, directing', as a form of movement in a straight line.

b   The *'spicio'* in *conspicio* is referring to *'spicere'*, meaning 'watching carefully' or 'observing'.

c   The *'tumio'* in *cortumio* is etymologically akin to *'tueri'*, meaning 'watching carefully', 'observing' and 'contemplating', as also heard in words such as intuition and tutor.

d   Hence the English word 'template' for a linear mould.

529 Labyrinth, after ancient Cretan coin[a]

530 Matrix

At the same time it is clear that this does not say anything as yet, because 'what' should now be designed? You just know, you could also conduct a 'conspicio' and try to read the 'signs' per place from the photographs. And also one might apply a 'conregio' by projecting on each place a directed diagram, a 'template'.

For the Augurs such a diagram usually was a square or circle, with within it a cross. I choose the diagram of the labyrinth according to the myth designed by the architect Daedalus.

53.8   LABYRINTH TEMPLATE

This labyrinth figure might be square or circular as long as it has seven tiers:[b] a labyrinth of the Cretan type. The labyrinth is not only a kind of architectonic (spatio-temporal) 'diagram', with an old fascination on me because of its many 'dimensional' aspects, but it also has a lot in common with the diagram employed by the Augurs.[c]

In addition to the *conspicio* and *conregio* it is possible to apply a *cortumio'* as well: that is to say: one may judge the 'signs' in relationship to the labyrinth diagram from one's perspective as an architect and let it accumulate in a concrete design.

The process of designing or creating may be seen as a continuing cycle between three questions: 'what?', 'why?', and 'how?'. In this case I could cover the 'why' in first instance by the ritual of the *contemplatio*. There was no need to worry as yet about the 'how' question: that is in first instance concerned with one's own confidence in oneself as a designer. Before that is put to test however, one should first know a little more about the 'what' to be designed.

So the game needs an internal logic, similar in a sense to the *legem dixit* ('the rule says') in the ritual of 'contemplatio'. The most obvious internal logic was the one of the matrix, of the 4 x 4 points themselves as prescribed by the material itself. I could make groups of four points which had to be charged next by a theme. Given the fact that not only the 4 x 4 places were numbered through horizontally, but that in the description of the concept for the exhibition four themes were also indicated - all of them associated with 'looking/seeing' - I simply used these themes, respectively 'surveying', 'watching', 'not seeing' and 'overseeing', as the vertical grouping principle of the 'matrix', in the present case perhaps better called the 'playing field'.

This also does not provide, as yet, a concrete 'what' for the various points, but resulted in more 'order and structure'.
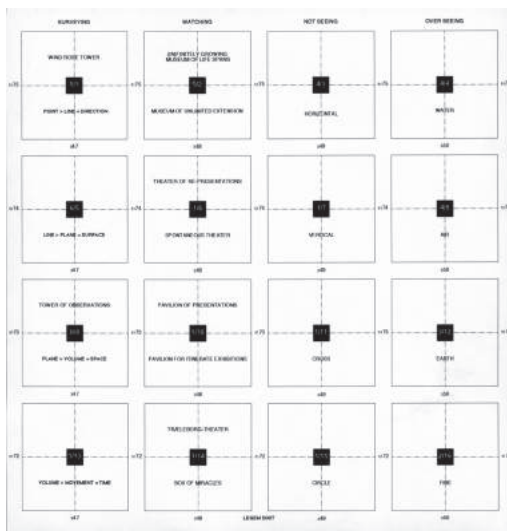
53.9   CONSPICIO

The next step was to play the 'game': that is to say to conduct the *conspicio*. And you start to understand that this has many similarities with a psychological association test. In order to get from the start many associations and so to see which 'signs' in the photographs were 'significant' (meaningful) I asked all my colaborators to write down per place and photograph some key-words; without giving it much thought, 'from the gut' as it were. I collected their reactions and looked at them together with the photographs from the perspective of the (vertical) themes in the matrix. I stood surprised by the consistency one can apply as an architect in such an ordering by some fantasy.

It is an old principle, particularly applied by writers. A fine example is Italo Calvino's *'The Castle of Crossed Destinies'*, in which he generates, with cards from the Tarot he puts out in a matrix, vertically and horizontally a number of stories.[d] These stories originate from the elements he finds on the pictures on the cards. Consider also Georges Perec's book *'Life; a users manual'*[e], in which he does something similar from a picture of a doll-house like cross-section of a 19th century apartment building.

This *conspicio*, linked to the *legem dixit* (what the 'law or rule' says about the theme), provided me with a further structuring of my 'playing field'. Now I could venture into the *conregio* and *cortumio* of actual design.

a   Source: Kern, H. (1982) *Labyrinthe, Erscheinungsformen und Deutungen 5000 Jahre Gegenwart eines Urbilds*.
b   That is to say that the labyrinth should be of the Cretan type.
c   Not to be explored further: a story in its own right.
d   Calvino, I. (1977) *The castle of crossed destinies*.
e   Perec, G. (1987) *Life: a user's manual*. Originally published in French: (1978) *La vie, mode d'emploi: romans*. Dutch translation: (2001) *Het leven, een gebruiksaanwijzing*.

53.10 SURVEYING

The vertical row of 'surveying' could, for instance, rather easily be read from a geometrical point of view of surveying as land measuring.

On the first location the wealth of lines was apparent, for instance, on the second the squared planes of the pavement, on the third the enclosure at four sides of the inner court in a building block and on the fourth the railway cars on a platform of exchange:

point → line = direction
line → plane = surface
plane → volume = space
volume → movement = time

This resulted then – while continuing to imagine and associate – in an ordering of the kind we know from a drawing by Paul Klee, in which he tried to clarify by arrows the various geometrical dimensions.

From the point (dimension zero) the line (first dimension) grows via an arrow of movement. On its turn this line transforms through arrows of movement to a plane (second dimension), then to a volume (third dimension, space).This volume may then be imagined as a representation of the fourth dimension, time; again, through an arrow of movement.

53.11 WATCHING

The second vertical row, with 'watching' for its theme, proved programmatically to be the easiest one, since I could associate in this row 'watching' via the 'signs' per location with the unity of the four elements occurring continuously in the oeuvre of Le Corbusier as a kind of *'Gesamtkunstwerk for watching'*. The architectonic work of Le Corbusier as a whole is pervaded by a kind of obsession for the eye and for watching.

Every time when he projects in his many urban plans a *'Musée à Croissance Elimitée'* again, this is accompanied by a *'Boîte à Miracles'*, a *'Théâtre Spontanée'* and a *'Pavillon des Expositions Temporaires'*. Obviously these designs do already have a programme.

In my case the 'Museum of Unlimited Extension', situated qua *templum* on a churchyard, became an '(In)finitely growing Museum of Life-spans'.

The 'Spontaneous Theatre', situated in the park of the Palace, became a 'Pavilion of Representation'.

The 'pavilion for Itinerate Exhibition', situated opposite the building of Parliament, became a 'Pavilion of Presentations'.

The 'Box of Miracles', situated qua *templum*, opposite of the old ramparts, became a 'Traeleborg Theatre'; more on that later.

53.12 RESULT

The remaining two rows will not be dealt with, since there was not space enough within the concept of the exhibition for more designs. I made designs for six locations: two from the first and four from the second row. Per row I formulated some playing rules, such as the material used and the technique for the making of the models (perspex for the first, wood for the second row).

With the rather strict exhibition regimen in view, dictated by an exhibition piece of furniture with three large, upright double glass-plates, I presented each design as a model, scale 1/ 100 in a perspex cube of 30 cm and a quadratic perspective drawing of 60 cm in pencil. This was drawn in such a way that the 'outside' of the design at one side of the transparent paper was visible in the 'inside' of the design, rendered at the other side. In addition there were per design one or two quadratic computer drawings of 30 cm, with plans, sections, elevations and an explanatory text.

So what was presented on the exhibition in Copenhagen were six 'contemplations', six designs for six different locations, all based on the same two-dimensional labyrinth dia-
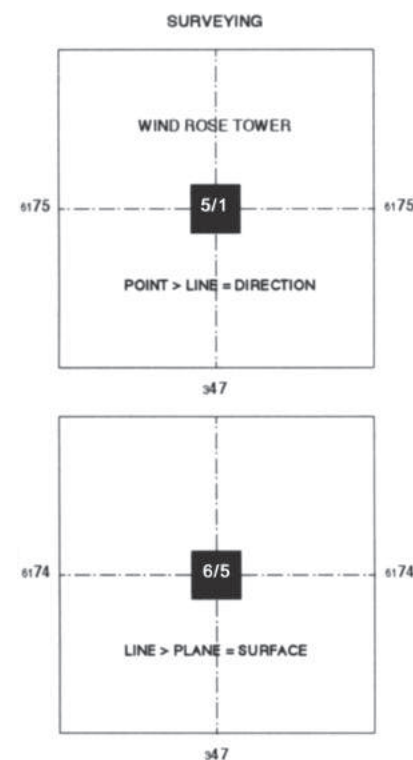
531 Surveying

532 Paul Klee, *Traumstadt*, 'Dream City' (1921) Watercolor and oil, 18 7/8 x 12 1/4" ; Private collection.

gram (one circular and five rectangular, in terms of basic pattern and measure all identical). Seen from above, the intersections of the UTM grid lines would thus be marked by the same two-dimensional emblem of the labyrinth (circular or square), while in reality they would represent as three- and four-dimensional architectures each of them a different spatial experience and 'function'.

53.13 INTUITION

As a piece of study by design this project clarifies what happens often subconsciously as intuition in the process of creating. Intuition is the knowledge and capability embodied in the person of the designer that operates on a level between the un-conscious and the conscious. Intuition, or in-sight[a], plays an important rôle in the design process, because one has to be able to follow as an architect, designer and generator of form (and within the design process of course also as an evaluator) a rapid route on the edge between what is possible and what is real.

It is a narrow road. On one side the 'scientific and objectivistic' monster of absolute determinism is lurking; on the other the 'artistic and subjectivistic' monster of gratuitous randomness. One operates in an in-between area that one has become to embody insight through embodied experience.

Deliberately, the word 'embody' is used. Still, all too often, it is attempted to ascribe insight in Cartesian sense to a so-called 'pure' spirit, severed from the body. A morality claiming descent from Plato further sees to it that we extol in our western culture thinking above acting. The work of the hand is still regarded as subservient to the work of the mind. However, Plato was a 'thinker' by profession, and lived in a culture where slavery was normal.

It takes one's entire somatic reality to experience and to learn; and I mean by 'embody' exactly the unity of 'body and mind' as one meets with in Waldenfels[b] or Johnson[c]. In the same way one arrives at one's own experiences physically – and to a high degree unconsciously – this 'area in between', the area of the 'imagination' (one's powers to imagine and to (re)present) as an architect is not explored exclusively by thinking, but (particularly) also by doing.

Just 'thinking a design' resembles trying to learn to ride a bike theoretically. In the first instance certain things are learned by doing; and it often helps not to think at the same time, but to postpone it to later. In the case of 'designing' we could talk about an 'art' in the fundamental meaning of that word, knowledge and capability linked to insight and vision.

During designing these embodied kinds of knowledge (science) and capability (art), manifest this 'experience' (physical) by insight, or intuition. The concept 'intuition' comprises next to insight also the aspect 'vision', that is so important to designing.

53.14 CREATING

As we use it in our discipline, the concept 'designing' puts too much emphasis on just one aspect of creating: thinking. That is the reason why I use the word 'creating' here. By creating I intend to indicate at one side the 'making', the rather 'profane' form of creating that should always be serious, and on the other 'creation', the rather 'divine' form of creating that can and should be occasionally frivolous and idiosyncratic. When we try to understand how creating goes about its business, we should first inspect the mindsets in which creating as a philosophical category is viewed in western culture in past and present.

Within Greek philosophy (and its predecessor, mythology) we discern largely three modes of creating: *'poièsis'*, the rather abstract, spiritual way to create (think of the semantically inclined figure op the 'poet'); *'technè'*, the rather concrete, physical way to create (think of the rather syntactically inclined figure of the engineer, the 'technician'); and *'praxis'*, the creating that originates from using, from executing and performing (think of the rather pragmatically inclined figure of the virtuoso).
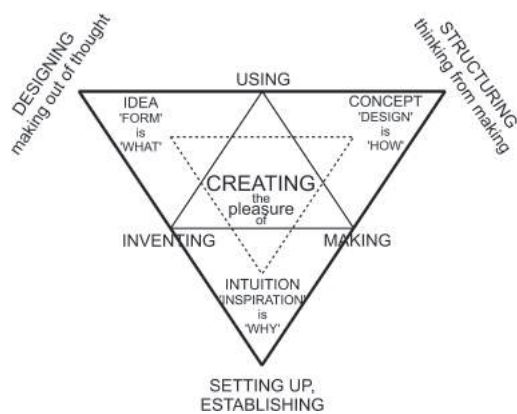
533 The Pleasure of Inventing and Making
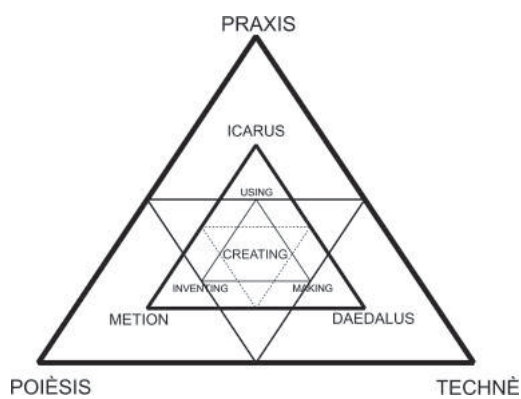
534 Setting in Classical Philosophy

a Intuition is derived from Latin '*intuèrì*', meaning 'looking at', 'contemplating'.
b Waldenfels, B. (2000) *Das leibliche Selbst, Vorlesungen zur Phänomenologie des Leibes*.
c Johnson, M. (1992) *The body in the mind: the bodily basis of meaning, imagination, and reason*.

Creating as the human mode of the 'divine game' of creating may be seen as the pleasure and satisfaction in the 'game of thinking out (inventing), making and using'.

The three faces of creating: very schematically and coarsely expressed in *poièsis*, inventing, *technè*, making, and *praxis*, using (and evaluating) can admittedly be distinguished from one another, but do remain a tripartite unity, enabling the game only as a closed form. This tripartite unity is reflected in the predecessor of philosophy, mythology. The unity is presented as a family relationship between mythological figures representative for ('human') creating. The best-known figure is Daedalus, the mythical architect-engineer-artist-inventor, the 'Maker', representing *technè*. His name is derived from the Greek *'daidal'*, meaning something like 'cunningly crafted'. His son, Icarus, the 'User' of the wings made by his father represents as the first test-pilot *praxis*. Daedalus' father Metion, less well-known, is the 'Thinker'. His name is derived from the Greek *'metis'*, meaning not only spirit, but thinking as well. He represents *poièsis*.

The idea of triple unity and trinity also exists in the Christian version of the 'Creating' (divine) Trinity in the figures of God the Father, Creator of the world, Christ the Son, descending into the world to try it, and the Holy Spirit, surveying the ensemble from up above.

However, the most important aspect for 'creative disciplines' in general and for architecture in particular is the joy one should experience as 'designer / creator' or 'architect / artificer'. One experiences it in the trinity of inventing, making and using, or of what one designs (invents), endows with form (makes) and applies (uses, tests and evaluates).

'Designing as planning' stands for 'making by thinking', 'designing as giving form' for 'thinking by making' and 'applying/ evaluating' for 'the evolution of what has been thought and made, by re-thinking and re-making again and again'.
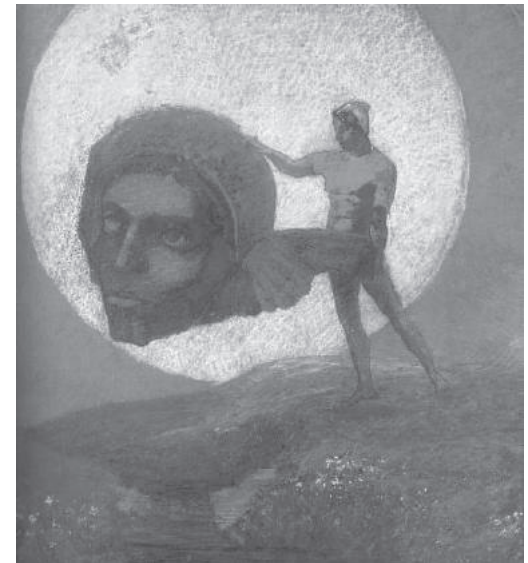
53.15 THE TRAELEBORG-THEATRE

How this continuous cycle of 'what', 'why', and 'how' questions are expressed in the design within the design process can only be shared and expressed, given the continuous considerations the cyclical process of 'inventing/ thinking', 'making/ doing' and 'applying/ evaluating' entails, in the designs themselves.

For an example I take the only circular design, since it shows how one can transform the two-dimensional pattern of the labyrinth (read as a figure of movement) into a spatial-programmatic architecture.

535 Odilon Redon, *The fall of Icarus* (1900) pastel, The Rothschild Art Foundation.

CONSPICIO: the reading of the signs within the 'Templum' represented by the four views and the aereal photograph.

536 The areal photograph

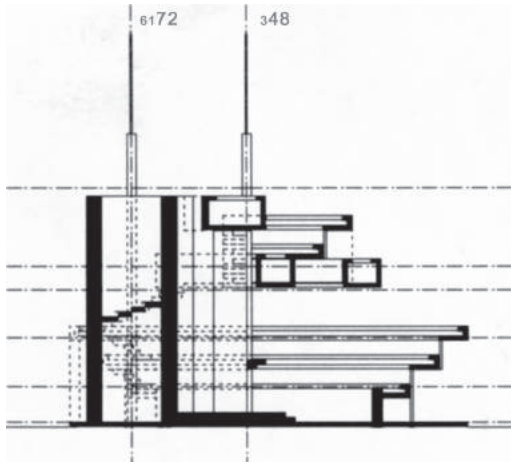Boulevard: a wide city street, often tree-lined and landscaped. French, from Old French *'boloard'*, *'belouard'*, rampart, promenade converted from an old rampart, from Middle Dutch *'bolwerc'*, bulwark. Bulwark: a wall-like structure raised as a defensive fortification, a rampart. A boulevard missing its bulwark? A field, a landscape not landscaped? A platform with traces of former buildings and columns, a tower not a tower.

LEGEM DIXIT: the 'theme' for this specific *Templum*.
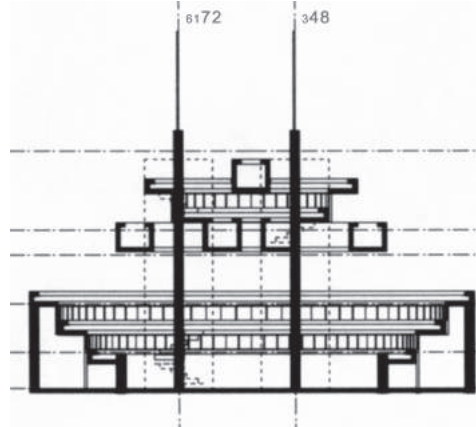
Box of Miracles.

CONREGIO: the laying out of the 'Template' of the labyrinth and its directions.

The construction of a labyrinth-diagram on to the location and the determination of its exact placement and directions according to the UTM Grid point takes place as follows.
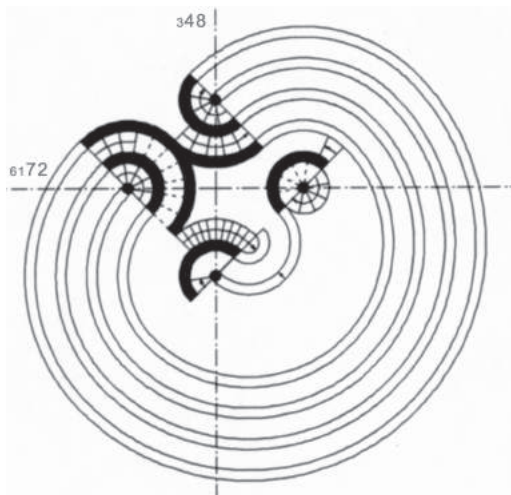
The UTM Grid point is projected to be the centre of a cross laid out in the directions of the UTM Grid, this cross is marked by four points in such a way that these points form a square of 4.80 x 4.80 m.
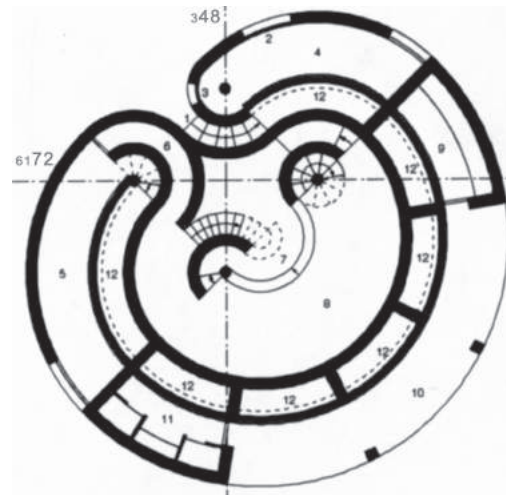

537 A tower that is not a tower

538 Box of miracles

539 Corner-points

After that the entrance of the labyrinth is determined by choosing a point on the square between two of the quarter-circles. This also defines the end-point since it will be situated on the line that leads from the entrance point via the UTM Grid point to the square. The entrance will be the centre from which the old city in the direction of boulevard and bridge. The end-point will be the centre from which construction of the labyrinth-diagram starts.

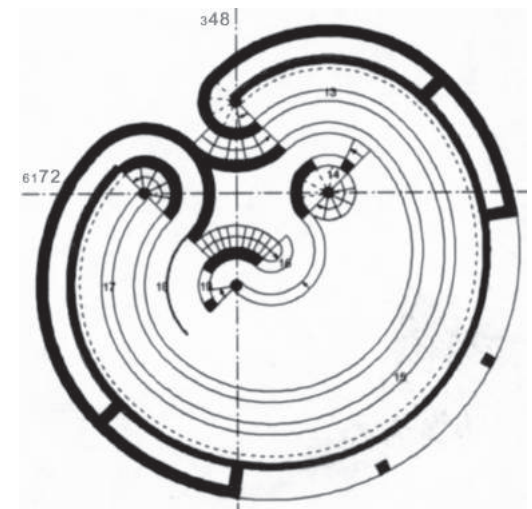CORTUMIO: assessing the signs by the rules of the inaugurators's science: the proposal of a design.

The Trealeborg-theater or Box of Miracles is a collection of different theatres within one volume, an Arena, an Amphi-theatre, a Puppet-theatre, a Projection-theatre, a Panorama-theatre and a Speakers-theatre.

Within this square these corner-points are then used as the centres of fourquarter-circles with a radius 1/2 x 4.80 = 2.40 m. and fourquarter-circles with a radius of 1/2x 2.40 = 1.20 m.

540 Fourquarter-circles

541 Entrance of the labyrinth

1 spectators entrance	7 stage
2 ticket-booth	8 arena
3 ticket control	9 cafe
4 office	10 terras
5 performers dressing room	11 toilets
6 performers stage-entry	12 storage

542 Collection of theatres

13 puppet-theatre	17 projection-theatre
14 puppet-stage	18 projection-screen
15 amphitheatre	19 projection-stage
16 stage balcony	

VERBA CONCEPTE   What could an offensive bulwark be, what an offensive fortification? A theatre? Traelleborg, Trøjborg: was the Danish labyrinth a fortification?

53.16 MAKING A MODEL

Making a model needs improvising creativity as well as experimental study. The curves, for instance, have been made by winding 1 mm thick plywood on pvc tubes with different diametres, while simultaneously gluing the sheets of plywood together. Obviously, curves produced that way at first do not have the exact size , because standard tubes never have exactly the right diametre; and when you cut open the winded triplex circle, after the glue has dried, you will see that the wooden arch produced veers a little back because of the tension in the wood.

This implies that you have to make each arch several times, while thickening the tube with tape, meanwhile observing how far the arch opens up after cutting, until you have produced the arch that is right for that part of the model.

53.17 LABYRINTH CONSTRUCTION

Constructing such a labyrinth diagram (the *conregio*) is relatively easy as long as you know how to do it.[a] In principle one always departs from a square with its four corners marked. These are the four endpoints of the four lines that are going to establish the labyrinth pattern. This square defined by its corner points is divided by means of a cross into four smaller equally sized squares. The centre of this cross / square is the starting point of the four lines that are going to establish the labyrinth pattern. In the case of a labyrinth of the Cretan type – one with seven tiers – one should sub-divide these four squares one more time still by means of hooks in equal distances.

Next the 'weaving' of the labyrinth pattern starts, by connecting one of the endpoint of the cross with the nearest point of one of the hooks (left or right), next by going to the nearest following point and connecting that in the opposite direction again with the first free point at the other side of the cross and so forth, until one has connected, by means of equally distant lines, all points. In this project the basic gauge between the lines of the labyrinth pattern was invariably 1,2 metre.

For the figure I used for the circular labyrinth, I went one step further still and replaced the cross with four quarter circles. This results in a smoother route (without straight lines) as well as in the possibility to project the entire (round) pattern this way perfectly and on real size on the 'site' quite simply with a couple of sticks and a piece of rope.

Opting for the circular, by the way, had to do with a complex of factors resulting from the *cortumio*, the interpretation of the 'text', generated by the *conspicio*, the reading of the 'signs'. In its turn this should be seen in the light of the *legem dixit*, the playing rule that prescribed that as a programme this should become a *Boîte à Miracles*.

Le Corbusier's *Boîte à Miracles* was a kind of multipurpose theatre, normally a large box with at one side a gigantic sliding gate, so that the actor's space could be orientated and used in different ways (inwardly or outwardly) and directed towards different spectator areas (inside and outside).

53.18 THEMES

The *conspicio* provided two aspects ('signs') that could be connected – via etymology – one to another: the 'boulevard', along of which this *templum* was positioned and the view (from our so-called 'non-place') on one of the old bulwarks of the city at the opposite side of the boulevard.

Etymologically the concept 'boulevard' is derived from the medieval *bulwark*, the earthen works of defending constructed in such a way – often with their star-shaped structure of protruding elements – that all parts of the defensive works could be surveyed and that, if necessary, the attacker could be shot in his back.

a See 'Constructie van een Labyrint', derived from: Kern, H. (1982) *Labyrinthe, Erscheinungsformen und Deutungen 5000 Jahre Gegenwart eines Urbilds.*

The (vertical) theme was 'watching' and the programme a kind of multi-theatre where watching is revisited etymologically. We had a bulwark in which, just as in the theatre, watching plays such an important spatially shaping rôle.

In my personal surrealistic mind, added to that was a fascination for the now suddenly strange Dutch word *'schouwburg'*: literally translated into English a 'fortress to watch from'; a neologism coined by our national poet Joost van den Vondel. The parallel is obvious: the theatre itself seen as on offensive.

From *'burg'* , *'burcht'* and *'borrow'* it is then not far anymore to the concept 'Troyburg', closely associated with the figure of the labyrinth[a], particularly in its relation to Denmark – and Scandinavia as a whole – where there are still many traces of earthen labyrinths, and city names related to them, which are called then 'Traelleborg' or Trojborg'. With a little fantasy it does not take much to put the 'poetics' of such a *cortumio* together.

53.19 DESIGNING

What remains is the actual architectonic design. But, that is also not so difficult if one considers that the essence is to develop from a two-dimensional diagram a three-dimensional space with the potential to comprise a specific programme.

It is readily admitted that it takes some trying out, but in this specific case I could conclude before too long; since the figure of the labyrinth is also a very specific figure of movement inviting use in a vertical direction in order to make out of a two-dimensional diagram a three-dimensional space. By the same token, I had to introduce, via (literally and figuratively spiralling) stairs, verticality. I situated them as a form generating 'rule of the game' in the armpits of the movement around the four endpoints of the 'walls'. The 'walls' are the black lines of the pattern defining the movement, 'Ariadne's thread': they are the spatial elements restricting one's movement in one sense, but guide them in the 'right' course in the other; as such these 'walls' could also be slits.

If I ordained for the 'walls' a thickness from 30 to 40 cm, they would make for excellent seats, while leaving another 90 to 80 cm to go around and about.

This meant I got a *Boîte à Miracles*, featuring: an amphitheatre, an arena for normal theatre performances with a roofed space for the actors, amongst other applications; two small theatres in the shape of a quarter circle; one puppet theatre and a projection theatre; a panoramic theatre where one may survey the environment; and a speaker's theatre, where the speaker in a kind of pulpit (the endpoint of the route through the labyrinth) is elevated above his audience in order to address it. Under the seating area the ticket office and ticket control could be located, plus the dressing rooms for actors, sanitary facilities, a bar and a small covered terrace. Constructing the Traeleborg theatre did not cause truly big problems. Looking back at it, a design like this just seems a child's play.

a   See a.o. Kern, H. (1982) *Labyrinthe, Erscheinungsformen und Deutungen 5000 Jahre Gegenwart eines Urbilds*.

54 LEARNING FROM THE BRIDGE PROJECT

JACK BREEN

In February 1999 the exhibition The Bridge (*De Brug*) was held at the faculty of Architecture in Delft.[a] A presentation consisting of some three hundred models of student designs for a pedestrian bridge. A vast and varied collection of objects, many of them arranged along a monumental 'canal' axis spanning a large part of the faculty's main hall. This extensive collection of work was the result of an exercise offered by the staff of the Form Studies department, as part of a second year educational block entitled 'Imaging and Materialisation'. The exhibition was the third of its kind, two previous activities being 'The Table', 1993 and 'The Bench', 1996.[b]

The theme of the original Form Studies exercise was 'The Footbridge'. Students were asked to develop a pedestrian bridge for a given – imaginary - site: a relatively modest canal with a width of just five metres and identical walled embankments on either side. The students had to 'realise' their ideas in the form of a presentation model scale 1 : 20, plus a design portfolio. Ten selected designs were eventually worked out scale 1 : 5, forming the visual 'centrepiece' of the exhibit.

The ambition of the exercise was to confront students with design themes like functionality, form and proportion, but also with specific qualities and possible combinations of materials, logical and expressive detailing and the consequences of 'making'. The idea was that students should continue refining their designs in the 'realisation' phase (in this case model making). For many students, this was an experience approaching 'realising' a first project (although reduced in scope and scale).

Despite constraints (or perhaps precisely because of them) a considerable number of students managed to come up with interesting propositions, often realistic, carefully detailed pieces of work, whilst a small group of students proved to be able to tackle the design task with such ambition and inventiveness that their designs can be said arguably to throw new light on the familiar phenomenon of the (foot)bridge

a   The exhibition – designed and organised by Jeroen van de Laar - was documented in the Faculty of Architecture's yearbook: Breen, J.L.H. (2000) *The Bridge*.
b   For an article on the exhibition 'The Bench': see Form Studies Staff (1998) *The Bench*.

The exhibition generated a wealth of responses and interpretations. Some faculty members even regarded the initiative as a kind of prototype for new forms of *study by design*. Why

543 The Bridge exhibition (some photo-graphs of the exhibit at the Architecture faculty)

was this? What might be learned from the project? In which ways may design activities like this one lead to – or even be considered forms *of* study?

Firstly, it became apparent that a presentation like this tends to activate to 'private study' amongst visitors; may be because there was a clearly recognisable 'format' that allowed – and indeed stimulated – comparison. At the same time, the *diversity* of the solutions proved to be a source of fascination. There was a tendency amongst *all* kinds of visitors (from professor to window cleaner) to identify *favourites* and to communicate one's opinions concerning the *qualities* (in a positive *and* negative sense) of specific designs. Such qualities might vary from the *originality* of the solution, the expression of *form* and the *technical* translation of the concept (even on a model level), to name but a few aspects.

Possibly researchers who recognised a 'study by design' potential in the exhibition discovered something for themselves. It might be they were to some extent able to 're-construct' the process of designerly enquiry underlying different design solutions, fuelled by a spontaneous, personal process of comparison and selection. Naturally, this response generated by the exhibition ought not to be considered a merit on *research* level, but it might be possible to learn something from the project's approach…

544 A comparison of characteristic design aspects
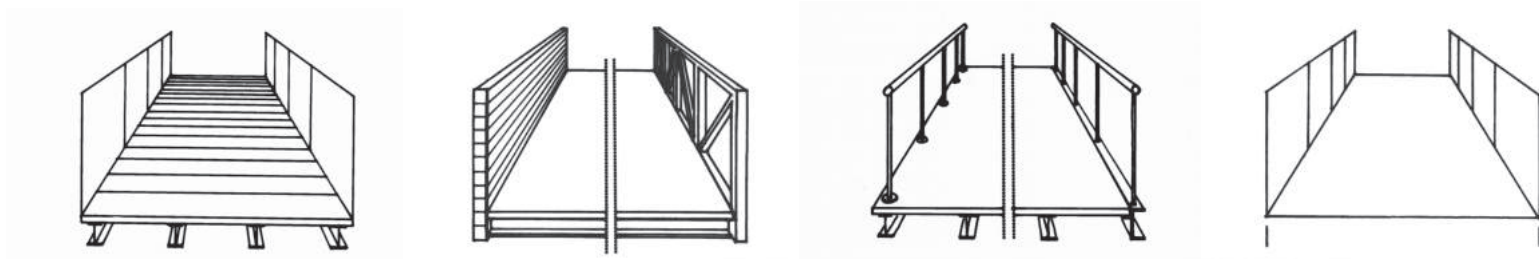
Apparently, the simultaneous confrontation with of a diverse, but thematically consistent collection of objects stimulates focused scrutiny and consequently selection and identification of qualities. Clearly, the *binding* theme - with an underlying set of design constraints - meant that the results could in principle be compared and analysed, initially in an intuitive way but potentially also in a relatively systematic way. The individual selection processes mentioned may also have been stimulated by the organisation - the *design* - of the exhibition: a clear overall spatial concept with a (seemingly) random placement of the artefacts. The emphasis on variety rather than on thematic or typological clustering may have offered a 'puzzle' to the viewers, who were thereby stimulated to seek out some measure of *order*, to recognise *themes* and to identify objects for which one felt a particular kind of *appreciation*, possibly even affection.

Secondly, the exhibition was not the only product of the Footbridge exercise. As with the previous projects, The Table and The Bench, a publication was prepared to co-incide with the manifestation.[a] Besides offering a generous overview of results, the articles in the book attempted to probe the bridge as a *phenomenon* and to reflect on the project as a whole. In this case the theme of the educational exercise was taken as a *starting point* for research activity.

Drawing from a wide range of sources and precedents, issues like the bridge as symbol, development of structural systems and impact of bridges in (sub)urban landscapes were addressed. In addition, an attempt was made to identify recurring design themes (see illustration). Such themes can be considered as - fundamental - design options, contributing to determining the manifest form of the bridge *as a whole*, as well as creating occasion for individual designerly *variation* of material and structural detailing.

In the book a selection of the students' work was presented in seven thematic clusters.[b] Rather than suggesting thematic order by choosing a potentially rigid organisation in *types*, a group of compositional categories was developed, intended to stimulate visual interpretation by the reader. In addition, a selection of ten 'laureates' was discussed in-depth, focusing on individual design themes and specific aspects of 'concretisation' of the designs. In this way the 'catalogue' to the exhibition was used as an intellectual exercise, exploring both formal characteristics and cultural connotations.

In retrospect, The Bridge experience might to be appreciated on different, inter-related, levels:

- As a design *laboratory* with the primary aim that students should acquire new insights, by designing and 'doing'.
- As a quest of *discovery* for students as well as teachers, allowing interpretation and comparison on a design studio level, as well as overall.
- As a collective, *thematic* form of enquiry, whereby the energy and open-mindedness of students were made instrumental for developing and identifying relevant design options that could be evaluated more or less systematically afterwards by a wider audience.
- As *design driven* research, firmly embedded in an *educational* context.

a   Breen, J.L.H. and B. Olsthoorn (1999) *De Brug / The Bridge*.

b   The themes were: The bridge as a piece of sculpture; The bridge as a play of lines; The bridge as a spatial object; Proportion and rhythm; Curved and folded; The dynamic form; The bridge as a device.
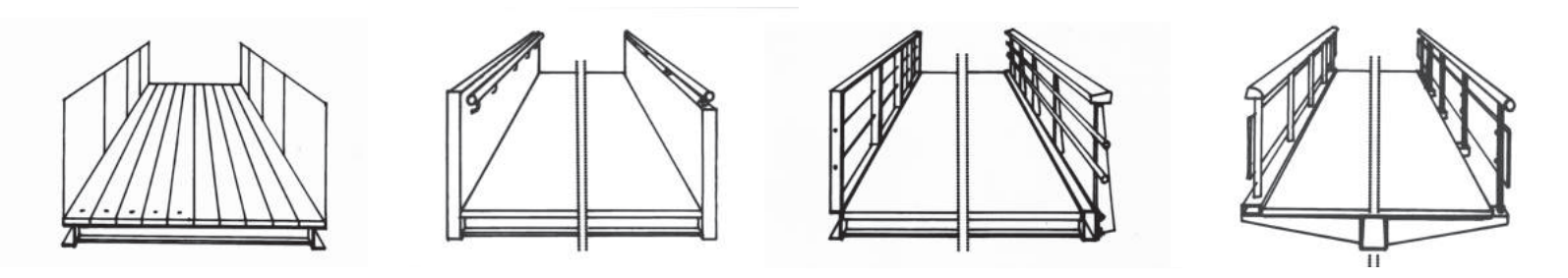
55 CREATING NON-ORTHOGONAL ARCHITECTURE

KAREL VOLLERS

The application of curved lines and surfaces in architecture, with their characteristic associative qualities, is receiving more and more attention. To realise these shapes at a reasonable price, one must make use of the newest techniques and stimulate innovation. This requires knowledge of the relation between function, form, means of materialising and structure of the market.

55.1   TWISTED SURFACES

In order to realise double-curved surfaces in their pure geometrical shape, various problems related to complex shaping were dealt with in phases, in a series of surfaces with an increasing degree of plasticity and complexity. This Chapter focuses on twisted surfaces. As they consist of straight lines, they are to be placed between the freely double-curved surfaces and the unfoldable surfaces, like single-curved surfaces and cones.

This kind of surface can be described by moving a straight line along a curved path. 'Ruled surface's' are twisted surfaces, constructed by moving a straight line and additionally rotating it. 'Curve surfaces' (a new kind of surface) are twisted surfaces too, but are constructed by moving and rotating a curve. Characteristic for twisted surfaces is that they always have a component of the rotation perpendicular to the movement vector. Twisted and double-curved surfaces have many similarities in their geometry and way of producing. The latter are, because of the different curvatures of neighbouring lines, more complex.

Twisted surfaces are archetypal forms, important to designers because they imply a great increase of the available semiotic vocabulary inherent to the use of shapes in architecture. Linked with the degree of transforming, the connotations of twisting range from associations with strangling, getting caught in a tight situation when the degree of twisting is big, to that of a romantic desire to break out of it, when the surface is twisted only slightly.

The different kinds of surfaces have specific names. Similarly it is useful to differentiate the various kinds of building volumes. In the sequence of volumes of increasing geometrical complexity, the following names may be included:

- Ortho's, shaped orthogonal
- Rotaters, rotated shapes: Cylinders, Domes, Globes, Cones, etc.
- Twisters, twisted volumes with a straight rotation axis
- Tordo's, with at least one twisted surface connecting with its rules to an orthogonal superstructure
- Blobs, freely double-curved surfaces

Many more specific names may be included, like Pyramids, Cubes, Morphers, etc. This Chapter is restricted to twisted shapes. Parallel to developing a scheme to organise the various twisted surfaces and volumes, their use in architecture was studied, and a building system developed to materialise them.

If twisted surfaces are to connect to an orthogonal built structure, the structure may be represented by a cube showing the starting position of the rule (red) that is manipulated to construct the surface, with icons depicting the vector of movement and direction of rotation. Additional directions of rotation may be added. They imply that the surface will no longer connect with straight lines to horizontal surfaces (floors) or parallel vertical surfaces in which columns or walls usually lie.
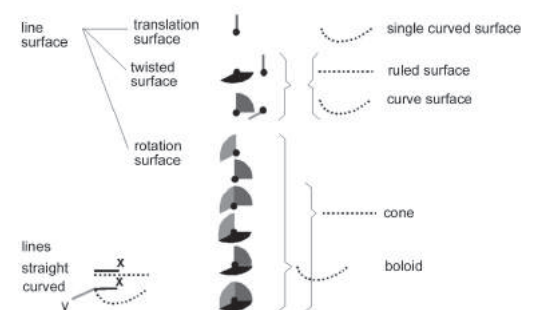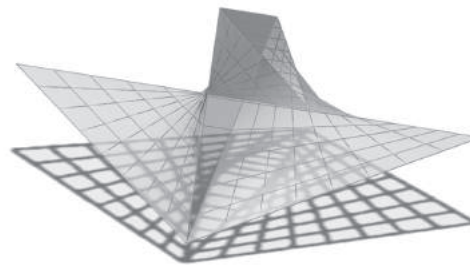

545 New scheme to differentiate between shapes

R1 R2 R3 R4
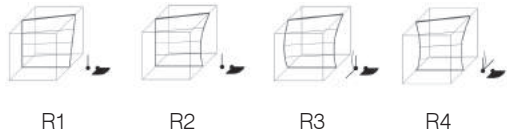
546 Four basic types of twisting

Four basic types of twisting can be defined when moving along a straight line:

R1 Two straight sidelines (a hyperparaboloid)
R2 One straight and 1 single-curved sideline
R3 2 sidelines curving in opposite directions
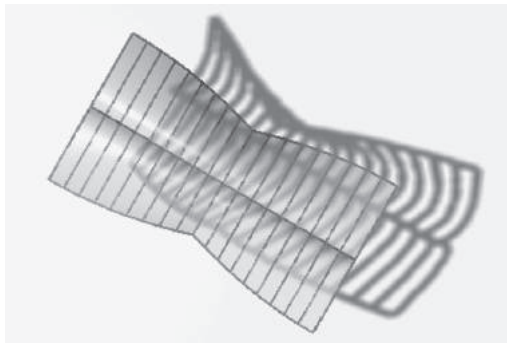R4 2 sidelines curving in the same direction

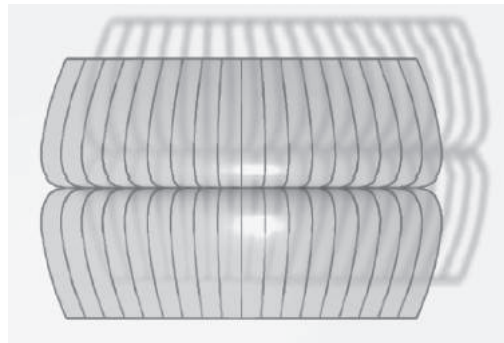547 Example of a combination of two ruled surfaces type R1

548 Five basic curve surfaces

Similar way to ruled surfaces, curve surfaces can be described with icons, instead of mathematical formulas.
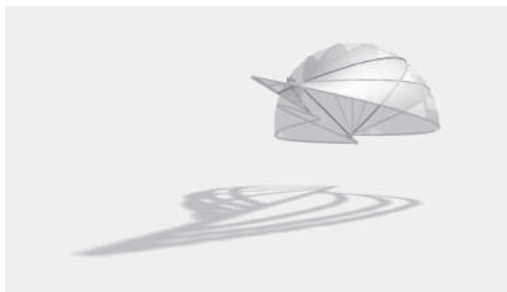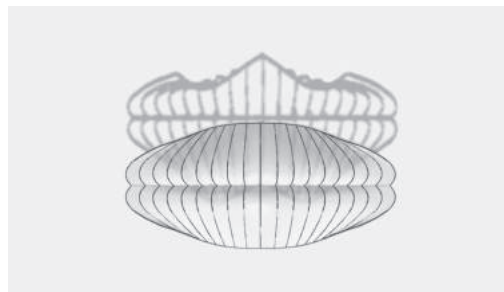

549 Curve surface K1


550 Curve surface K2

551 Curve surface K3

552 Curve surface K4

553 Curve surface K5

55.2 EXAMPLES OF TWISTED SURFACES IN ARCHITECTURE

This high-rise 'tordo' with twisted (and flat) façades, with floors and walls meeting under straight angles, is relatively easy to materialise, due to the straight lines in the twisting surface connecting to the superstructure. The façades at the front and backside of the model are a ruled and a curve surface.
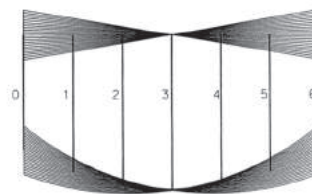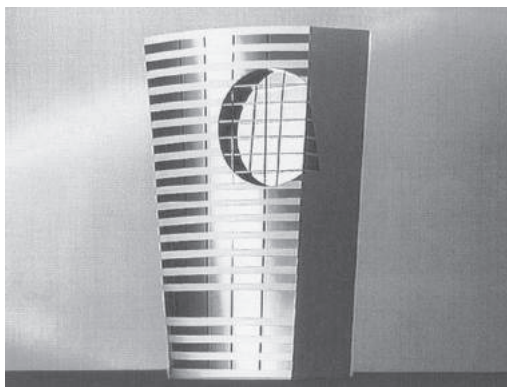

554 Tordo 1
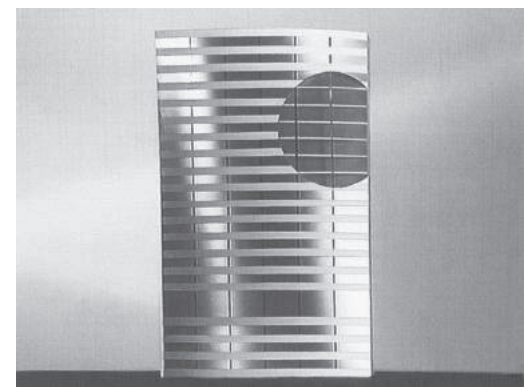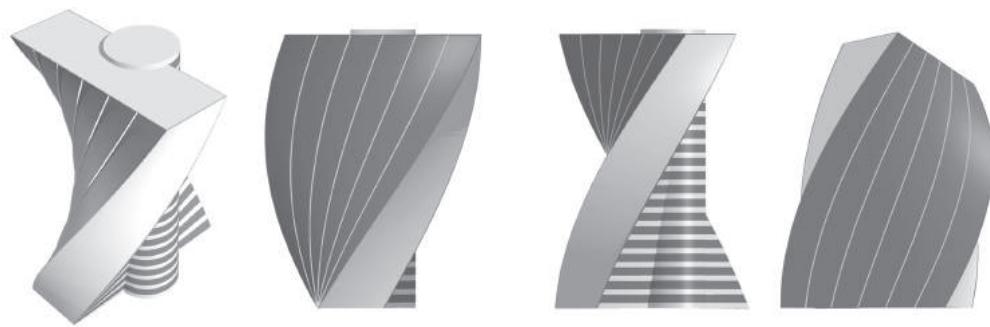
A 'twister' has floors positioned around a vertical axis; in this 20 floor high model the twisted volume has been combined with a cylinder. In the core some building components (like elevators) rise vertically, while other components (like sanitary units and stairs) rotate in conjunction with the officewings. The varying positioning of the components results in a different plan in the core on each floor.

555 Twister 2
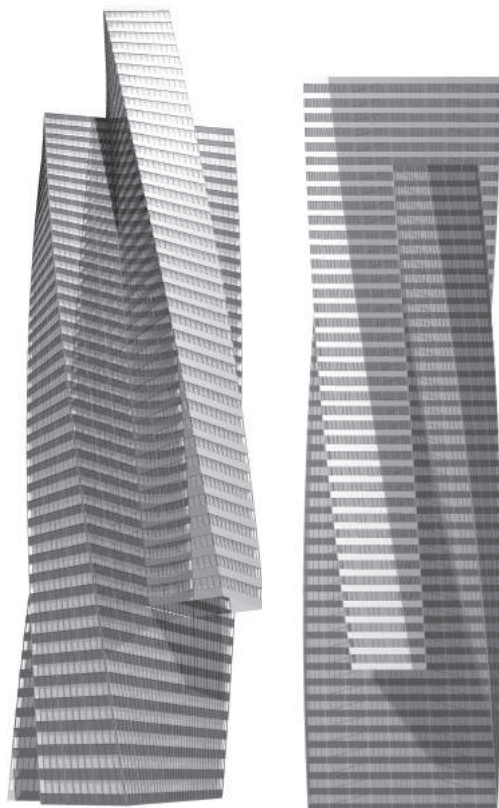
The two perpendicularly inter-secting volumes of this 150m high twister, offer a playful contrast of façade finishing. The building is conventional in use; as a result of the only slight twisting of 0,5' per m1, the façades hardly incline. The volume as a whole looks spectacular, with the many slightly twisted elements, adding up to the considerable twist of 70'. There is an enormous repetition of parts. The structural design was made by ABT Engineers.
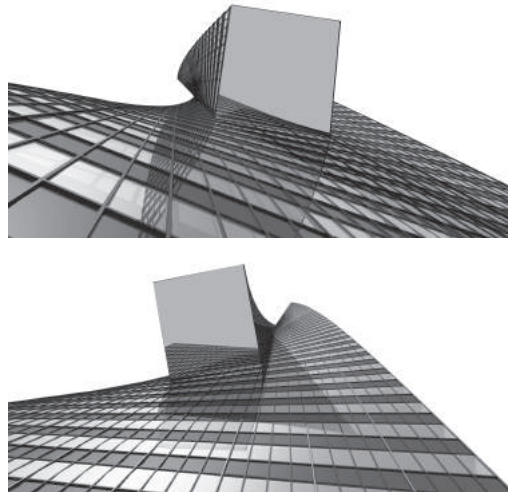
556 Twister 3
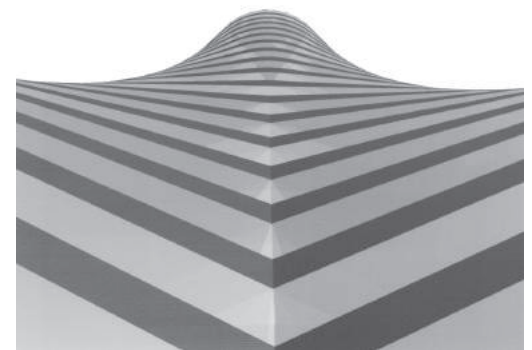
To study an alternative for the superstructure, this symmetrical composed 60m high twister was designed. Two wings rotate in opposite directions around a cylindrical core. Because of the contrary rotation of the wings, the floor plans in the core vary on each floor. The concrete core is essential for the stability. The reflection of a twisted façade in a twisted façade, results in unexpected images.

557 Twister 4
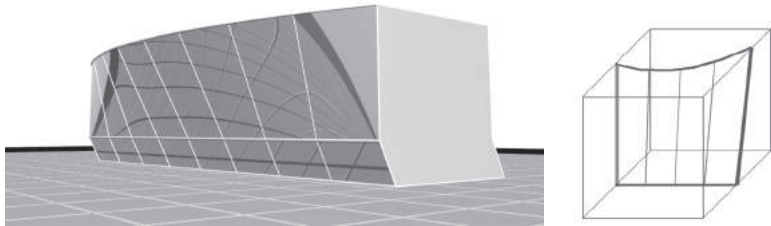
558 Low-rise tordo 2a

This is a low-rise tordo, with a ruled surface façade type R2. The moving reflections of cars, or pedestrians, will distort and slow down or accelerate.
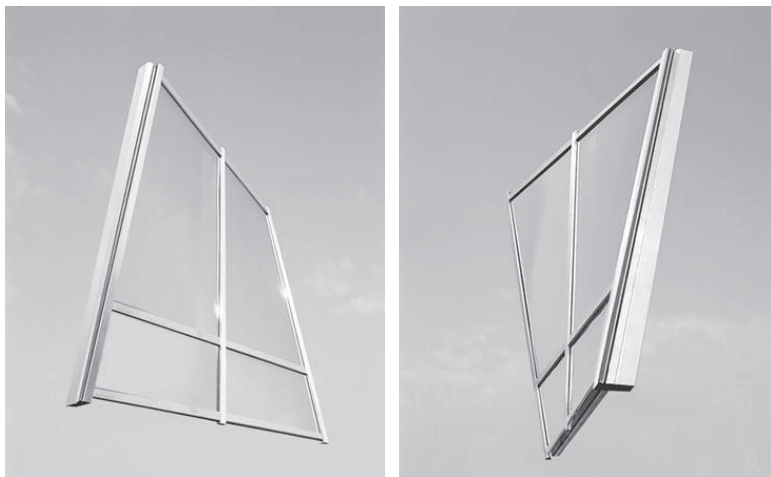
An industrially produced framing system for twisted façades was designed, with warm bent twisted glass (both a world-wide first). The frame combines a stiff backing profile (for example positioned everywhere parallel to floor and wall), with a glazing profile parallel to the glass surface (twisting or if preferred freely-doublecurved). The system was developed in collaboration with:

Reynolds Architectuursystemen, Reynolds Special Products and Van Dool Constructies.
Van Tetterode Glasatelier, Eijkelkamp and Glaverned.
Hellevoort Visuals
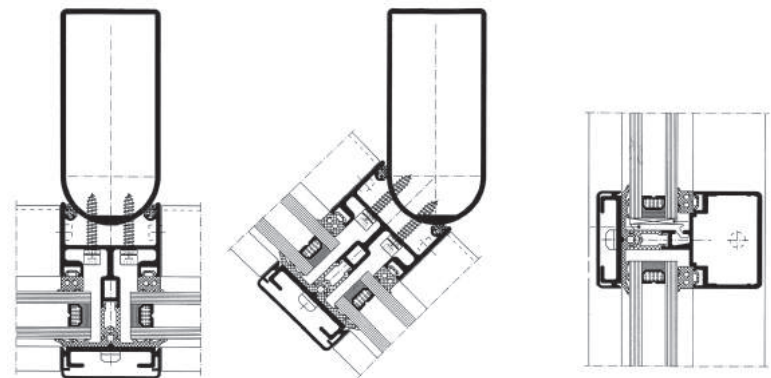
559 The reyno twist window frame-system

56 DESIGN IN STRATEGY

DIRK FRIELING

All planning is rooted in the belief-system that people are free agents that by conscious actions may influence the course of events in the way they deem fit. Designs are means to enlarge awareness of potential consequences of specific actions. For that reason, plans are instrumental in improving human ability to organise society and to shape the world according to attitudes to life and images of society present in the human mind.

Conceived this way, planning is a human activity implying considerable responsibility: one reason to oppose planning. The most effective way to escape this responsibility is to deny the possibility of planning: *'it is not up to human beings to shape the future'*. Devout as this may seem, it opposes the essences of Christianity and humanism alike, both focusing on freedom of the individual and responsibility of that person to act accordingly. For practical reasons too, this kind of opposition to planning is not to be taken seriously. Human society, and especially the city, by far the most impressive human achievement, just would fall apart if people stopped planning.

A second reason to oppose planning is that is encroaches on personal liberty. Evident as this may seem, it is true only, if one leaves planning to others and does not take personal responsibility by participating in the planning process oneself. On a deeper level, the tension between individual and collective liberty can be seen as tension between a concept of freedom as something in the nature of things, that everybody is entitled to as a consumer, and a concept of freedom as a potential of human beings, that every single person has to develop as a producer.

For both reasons, this kind of opposition to planning should be taken quite seriously. To overcome the encroachment argument, planners must participate or fail. To overcome the consumers approach to liberty, planners are wise to show how small, frail and unstable human freedom is and how only joint effort may sustain, strengthen and enlarge it.

Planning is concerned with future action under future conditions in a future situation: a heap of uncertainties to be considered. As most people do not like to live with uncertainties, planning can be seen as a way to reduce uncertainties. The main characteristic of the future is that it is not yet there, it exists only in the human mind, it is by definition a virtual reality.

56.1 FOUR WAYS TO FACE THE FUTURE

To find out what may come, one can follow several methods. This article distinguishes four of them. One is rooted in the idea that everything embodies a spiritual existence or energy; aeternal, beyond time and space. To find out what may come, contemplate that existence or energy and articulate what comes up in your mind: the way of art, the alpha way.

Another one is rooted in the idea that everything is organised according to rules inherent in energy, time and space. To find out what may come, try to discover them by analysing the evolution of systems. Knowing the rules, we may predict their future course: the way of natural sciences, the betha way.

A third one focuses on people as the main source of human events. If we can discover the driving forces of their actions we may influence their behaviour in the future. The rules of the game here are as important as in the natural sciences, the difference being that they are manmade and open to human influence: the way of social sciences, the gamma way.

The last method distinguished here considers everything as ongoing recreation. The focus is on emergence of the present not from the past but from the potential of the future. In it the present is not caused by the past, but conditioned by it. The past does not push the

present; the future attracts the present. This is the way of designers and engineers, people inventing things: the delta way.

In day to day reality, of course, all these methods continually intertwine. But, in University, these methods have to be dis-entangled to clarify them by ongoing research and to test and improve them for educational purposes. As this book is written for designers and engineers the focus is on design, the delta way.

First of all, the rôle of design in strategic planning will be explained in theory. After that, the case history of the emergence of the concept Deltametropolis[a] will be used to demonstrate the rôle of design in practice. It will be elaborated by three examples: design as a method to clarify political options[b], the contribution of design to investment strategies and design as a method to forge social alliances. The concept 'Deltametropolis' was not there from the beginning. There was no hidden agenda. Nevertheless, it emerged from several more or less independent design exercises.[c] The hidden order of Deltametropolis was exposed by inter-action of discoveries and inventions, generated by an intermittent process of design[d] that started in the middle of the eighties and is still going on.[e]

56.2 THE RÔLE OF DESIGN IN STRATEGIC PLANNING

Strategic planning starts with acknowledging that there are all sorts of futures to reckon with.[f] As far as people want to influence the future they do this by setting aims and allocating means.

When aims and means are both undefined, we find ourselves in the realm of potential futures; the domain of inventors, designers and engineers. Design is mainly conceptual.

When aims are defined, but means are undefined, we are in the realm of desirable futures, the domain of all kinds of private associations, interest groups and political parties. Design is programmatic, functional and system orientated.

When, the other way round, means are defined unlike aims, we enter the realm of probable futures; the domain of traditional research. Design is aimed at process, not product: design is to conceive rules regulating the course of events.

When aims and means both are defined, we can call them necessary futures. Strictly speaking, the word 'necessary' is logically not allowed, because aims and means are defined by arbitrary human decisions. However, for this typology of futures within a framework of strategic planning, the word 'necessary' is clear enough.

Designing has several dimensions that will be referred to with four different adjectives: formal, functional, technical and analytical. In the same way the four dimensions of time-space generate undivided experience, these four dimensions of design are included in undivided action. They are continuously present in the hand and mind of the designer. But, the force of their presence changes with evolution of the design and with the different rôles of it and of the designer in that evolution.
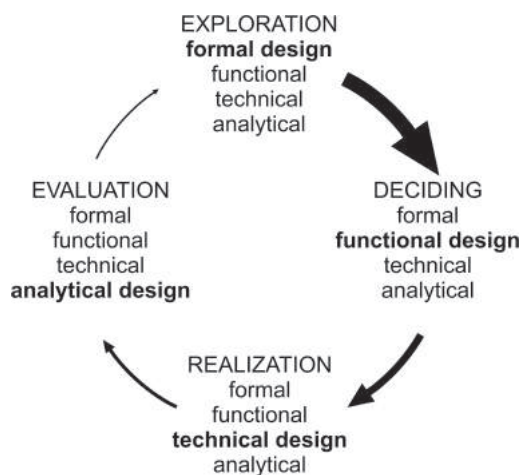
In the phase of exploration, when aims and means both are indefinite and undefined there is nothing more to design than form, formal composition and formal relations. Via these forms I explore my environment in search of viable combinations of placebound situations and timebound activity patterns. Because of this, designs in this phase of exploration often have a rather formal and schematic character.

In the phase of deciding there will be requirements to meet. They may become dominant as soon as a client has to decide on a design, having to take all kinds of political and financial risks. The functional dimension of design will grow in importance as form and function have to harmonize.

In the phase of realisation the aim is always to find the optimum solution for a wide array of conflicting requirements. There technical design is needed, the invention of the most effective and efficient combination of mutually contradictory demands.

MEANS \ AIMS	undefined	defined
undefined	potential futures	desirable futures
defined	probable futures	necessary futures

560 Typology of futures

EXPLORATION
formal design
functional
technical
analytical

DECIDING
formal
functional design
technical
analytical

REALIZATION
formal
functional
technical design
analytical

EVALUATION
formal
functional
technical
analytical design

561 The rôle of design in different phases of a development process

a   Frieling, D.H. (1995) *Het metropolitane concept.*
b   Frieling, D.H. (1997) *Verstedelijking als politieke opgave.*
c   Frieling, D.H. (1996) *Het metropolitane debat;* Frieling, D.H., W. Mitchell et al. (1996) *The future of design and research.*
d   Frieling, D.H., W. Reh et al. (1998) *Onderzoekateliers Bouwkunde Onderzoek Deltametropool Atelier Stad.*
e   Frieling, D.H. (1998) *Het metropolitane debat.*
f   WRR (1977) *Nederland over 25 jaar;* WRR (1981) *Beleidsgerichte toekomstverkenningen;* WRR (1983) *Poging tot uitlokking.*

In the phase of evaluation – whether ex ante or ex post – designing will become deconstruction, an analysis aimed at exposure of the inter-action between an object and its environment, as well as its use and users.

56.3 EXPLORATION

To clarify the specific rôle of design in the phase of exploration we must further analyse the specific contribution of formal design. Since one explores the future by design, and both aims and means are undefined, one may fear to wander aimlessly in the dark.

Any object in any context, designed for a specific programme of requirements in a specific situation for a specific client, at a specific moment by a specific designer is, because of all that, considered to be unique. However, in strategic planning, objects and contexts have to be used for typical reasons, as well as for reasons of unique fit to situation or vice versa.

This double identity of design, being both singular and a type, can be clarified by the scheme shown distinguishing between defined and undefined objects and contexts. When both object and context are defined, we can evaluate like in a case, analysing properties, internal inter-action and other characteristics. This is what we may call design research.

Exploration by design starts when one or both of these components are kept undefined. By liberating an object of its context, and projecting it in all kinds of contexts, we can analyse its transformations and discover its continuous properties, that is: its type. By liberating a context of its object and projecting all kinds of objects in this context, we can analyse its continuous influence on these objects, that is: its identity or *'genius loci'*.

Both forms of exploration by design are useful by themselves. They also serve to explore areas where both object and context are undefined. There and then design is used to discover an agenda.

One may think this scheme does not work for inventions or discoveries: there is no case to start from. Experience shows that the creative mind in this situation does not work in empty space, groping in the dark. It is trying an endless series of examples that might serve as an analogy. This may explain why designers often speak in metaphors. They have to use these analogies to explain what they are looking for. The 'Deltametropolis' is a perfect example of this. By choosing this name, two directions of exploration are introduced: connectedness and inter-action between people to explore the type of metropolis the people living there may become; and connectedness and inter-action between watersystems to explore the identity of the delta that is the breeding ground of this metropolis.

To conclude this short introduction to the theory of the rôle of design in strategic planning a simple scheme may help (figure 563) to improve awareness of design as a social process. This awareness is important in organising participators in planning and in keeping in mind that good planning enlarges liberty and does not diminish it.

The design as a material object is the product of the inter-action between a territorial situation and a programme of requirements, generated by an activity pattern. This inter-action is personified by respectively landowners and people using the land. The design as an intervention is the product of the inter-action between change and continuity, personified respectively by initiators of change (developers) and people in charge of certainty, safety and continuity (government). In a more abstract way the design can be conceived as the transformator of four interacting forces: use of space and spending time transform under pressure of opportunities and threats that work to generate change but interact with rules and regulations to maintain the status quo.
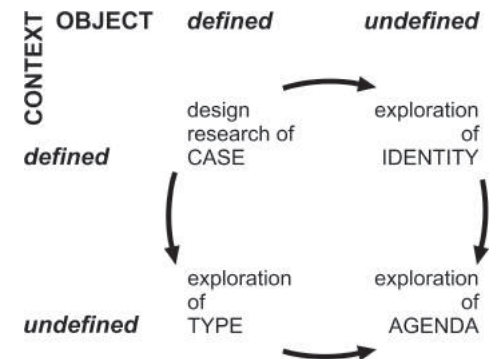
562 Exploration by design
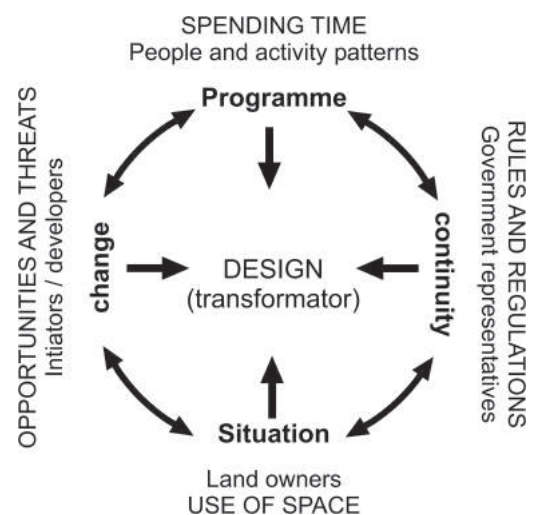
563 Design as a social process

56.4 DESIGN TO CLARIFY POLITICAL OPTIONS

In the seventies the Netherlands were influenced rather greatly by co-incidence of the Club of Rome report on 'limits to growth' and the first energy crisis, triggered by OPEC-countries. A few years later, even planning for the future became politically incorrect. This standstill in planning triggered an initiative by the Foundation Architectural Museum (presently the Netherlands Institute of Architecture, NAi) called *'The Netherlands Now As Design, the rules of growth'*. The idea: to organise an exposition on the Netherlands in 2050.

The initiators[a] took two policy- orientated explorations of the future by the Scientific Council on Government Policy as a starting point for their exercises in design. They decided to make four designs for 2050. The social-democratic design is called 'Critical', the conservative design 'Dynamic'. The christian-democratic design 'Careful'. And a future based on technological and political breakthroughs 'Relaxed'. With the exposition on the Netherlands in 2050 they aim to kill three birds with one stone: regain attention for planning, explore future transformations of the Netherlands under different sets of rules for growth and, in the wake of the Scientific Council, to revitalise politics. The Foundation NNAO (1984 – 1989) organised the support of government departments, universities and private research organisations, collected four million guilders and engaged the 'fine fleur' of the design profession. A three – year design programme followed with more than 200 professionals participating, meeting every three months to discuss designs and progress.

The exposition of these four political perspectives was opened by the Prime Minister in Amsterdam in 1987; a second viewing organised in Rotterdam in 1988. The State Printing Office published a two-volume catalogue: one with all the designs, the other with background research. Exposition and books were widely discussed in the press and covered by television.

In the course of this design exercise the organizers developed a method to make political options comparable, by conceiving the spatial system of the Netherlands as consisting of four sub-systems: water system, rural system, transportation system, urban system. They conceived landuse policy as a multi-level system of planning offering a choice between concentration and deconcentration on each planning level. And they conceived the governance of this landuse policy to be influenced by the value systems of different political parties as generated by their respective images of society. Figure 564 shows the frame of reference as developed by NNAO, each party programme containing positive statements on the different spatial sub-systems and each proposing a different option of settlement patterns.

The Scientific Council was helpful in commissioning Rob van Engelsdorp Gastelaars and Leo de Klerk from the University of Amsterdam to write the political scenarios for the Critical, The Dynamic and the Careful future. The Foundation commissioned Taeke de Jong, from Delft University to write the Relaxed scenario. All four perspectives are similar in their attention to the rôle of the water system, the decline of agriculture, the importance of international connections and the transformation of patterns of independent cities into multicentred network systems, urban constellations.

These four scenarios result in four different landuse programs shown in figure 565.

Searching for a sustainable balance in these matters, the four perspectives follow a different policy, resulting in different directions of development. The planners and designers show that quite different attractive and consistent futures can be invented and developed: four perspectives that overlap in many ways, differ according to the political priorities attached to economic growth, social equity, environmental sustainability and cultural identity.

The Careful perspective shows the Netherlands as part of Europe, leaving out state boundaries. This European orientation gives the eastern and southern parts of the country a more central position, whereas the western part is becoming more peripheral. The network of roads and railroads is transformed from the present starlike shape, radiating from the west,

Radius	DISPERSION							
100 km	Deconcentration						Concentration	
30 km	Deconc		Conc		Deconc		Conc	
10 km	D	C	D	C	D	C	D	C
LANDUSE		Careful	Critical	Dynamic				Relaxed
Urban system		+	**+**	+				+
Transport system		+	+	**+**				+
Rural system		**+**	+	+				+
Water system		+	+	+				**+**

564 The Netherlands as a choice of policy options

	1986	Careful	Critical	Dynamic	Relaxed
Water	9	9	16	10	10
Nature	14	22	29	35	30
Agriculture	65	51	39	34	46
Infrastr.Industry	5	7	8	6	9
Urban areas	7	11	8	15	5

565 Landuse in % of total area of the Netherlands

into a grid connecting all parts of the country to each other and to neighbouring European countries. The water system is re-designed to enable natural watercourses to retain more water. Agriculture and nature are integrated, farmers cultivating both. Cities, towns and villages grow independently, maintaining a nice provincial air in the urban system while the country becomes ever and ever more densely populated. *Eindhoven* – pride of the south – is chosen as subject of regional design.

The Critical perspective is designed for a society that changed radically in three ways: energy systems are based on sunlight, wind and biomass, working hours are reduced to three days per week and all urban regions are connected to the European network of high speed transport. Combination of less work and better connections extend the job market to Hamburg, Berlin, Frankfurt, Brussels, Paris and London. The western part of the country is transformed into an ecological balance area. The former Green Heart is changed into a huge water-realm and cities and wetlands are integrated into one ecological system. Elsewhere also large areas are transformed into wetlands and nature reserves. Agriculture for the international market is concentrated in the clay areas in the north, middle and south-west. *East-Groningen* – at present one of the poorest parts of the country – is chosen as subject of regional design.

The Dynamic perspective is based on a market-orientated scenario. The western constellation of cities is strengthened via three interventions in the transport system: a new international combined seaport / airport in the sea, high speed railway connections with the rest of Europe and a new circle line to inter-connect the main cities in the west. The country as a whole is in a way considered as a 100 Mile City, still having its CBD in the west and living areas on higher and drier grounds in south and east. The lower parts of the country are transformed into large scale wetlands for water-management. Farming has become large scale factory farming. *Amsterdam* – international trade centre – is chosen as subject of regional design.

The Relaxed perspective combines all technological and political breakthroughs one can think of. The essence of this perspective is that all these breakthroughs put together will not lead to ongoing urban dispersal but just the other way round, to a new period of urban concentration. This is exactly the same conclusion Manuel Castells drew in his book on the Informational City[a] and Saskia Sassen in 1991 in her book on the Global City.[b] The central technological breakthrough will be the availability of cheap energy by nuclear fusion and by harvesting sunlight, for which 2000 SqKM are allocated. Energy being no problem anymore, speed of transport can be multiplied. The political breakthrough (envisaged a few years before the fall of the Berlin Wall) is that technology of communication will be the driving force to break through old world political boundaries. This will have geo-political influence and change the traditional political decision process into interactive policy development. In this perspective of a full energy economy and trans-continental magnetic train systems, *Rotterdam* is the region to concentrate on. It will no longer serve only as a mainport for Germany, but also for Central Europe and Russia.

56.5 MAJOR IMPACTS OF THE EXERCISE

The impact of this exercise in using spatial design as a method to explore the future may show on different levels. One of them will be assessed here: its usefulness to clarify political options and its impact on everyday politics. The contribution to strategic planning and the influence on design methods has been treated already in the theoretical introduction to this case history.

The political events of the day are that a year after the exposition *'Netherlands 2050'* the fourth policy document on spatial planning appeared in 1988. Central government in the Netherlands is legally obliged to produce such a policy document every ten years.

A year later again, in 1989, the foundation Netherlands Now As Design published an investment strategy[c], based on this policy document, financed by the main pension funds and

a   Castells, M. (1989) *The Informational city.*
b   Sassen, S. (1991) *The global city: New York, London, Tokyo.*
c   NNAO (1989) *Nieuw Nederland, proeve van een investeringsstrategie.*NNAO (1989)

life insurance companies. This investment strategy originated a public-private committee on spatial investments chaired by a former minister of Housing, Planning and Environment and consisting of departments, burgomasters of Amsterdam, Rotterdam, The Hague and Utrecht and representatives of private sectors.

The arguments for metropolitan development are quite pronounced in the Dynamic, Critical and Relaxed perspectives, although for different reasons: economical in the Dynamic worldview, ecological in the Critical, the outcome of technological breakthroughs in the Relaxed perspective. The designers mis-interpreted the Labour priorities however. Labour allied with the Christian-Democrats in an anti-metropolitan policy. This became clear by the difference between the fourth policy document on spatial planning[a] and a fourth policy document 'extra'.[b] The original report, issued by a conservative minister of planning, had as its main issue metropolitan development in the west. Three years and a cabinet crisis later, a socialist minister issued an extra report in which the three main cities in the west are replaced by thirteen cities all over the country. That minister now is the Queen's Commissioner in Groningen.

The committee on spatial investments commissioned a study on a high speed / high frequency transport service between the main cities in the West and Schiphol Airport. By reducing travel-time the separate cities would be integrated into one urban system that would improve overall efficiency and hence its earning capacity. By the time the report was published in 1992, the tide of metropolitan development was out already. The four perspectives all had been orientated on Europe. In political reality however, not the international future, but the provincial present did win the day.

Summing up these experiences one may conclude that the political impact of the project has been pretty thin as far as direct influence on landuse policy is concerned. On a deeper level however, design has been discovered as a method to explore the future. Many political issues on top of the political agenda today, like water-management of the delta, decline of agriculture and the need to rethink the transport system were imagined fifteen years ago. The designs made all sorts of expectations visible, publicly debatable and subject to planning and decisions on investment priorities. But to change potential into practice, the focus of research has to be directed to the decision processes themselves.

56.6   DESIGN TO DECIDE ON INVESTMENT STRATEGIES

The research project that followed the line set by *The Netherlands Now As Design* and preceded the Deltametropolis declaration[c] originated in the Faculty of Architecture of the Delft University of Technology. For years it had been clear to professional planners that the loose pattern of urban centres in the west was rapidly transforming to a collection of cities with overlapping spheres of influence causing interference, competition and a general loss of competence to promote common interest. For that reason research was done to find means to generate a next transformation, in which this collection of separate cities would integrate into an urban system, an inter-connected constellation of urban centres, a multi-centered metropolis.

At a Faculty of Architecture, research is mainly study by design. To be able to focus on decision processes, partners were found in the University of Amsterdam and the National Institute of Planning and Housing, a private association of planners and local politicians. With financial support of the main cities in the west and several departments, a foundation was created: The Metropolitan Debate. The aim of this foundation is to experiment with new methods of decisionmaking to get better decisions quicker. The idea is that metropoli distinguish themselves from other urban concentrations by being able to do just that: take better decisions quicker. The method conceived to improve the decision process on planning policy distinguishes between perspectives, projects and strategies.

Perspectives are general and integrated long-term policy statements illustrated by designs to indicate different directions of development.

566 Two out of four perspectives, see also page 457.

a   VROM (1988) *Vierde nota over de ruimtelijke ordening.*
b   VROM (1992) *Vierde nota over de ruimtelijke ordening Extra.*
c   Amsterdam, Den Haag, Rotterdam and Utrecht (1998) *Verklaring Deltametropool.*

Projects are direct interventions in existing situations. Strategies are a combination of one perspective with a portfolio of projects that will contribute to realisation of that perspective.

The decision process addresses participants in three rôles: as individuals deciding on their own place of residence, as agents in initiating and realising projects and as citizens in defining and selecting perspectives.

The decision process itself consists of decisions in a series of four steps, starting at home where everybody cherishes his or her own opinions. The next step is to study available perspectives and projects and to decide on personal preferences, eventually preparing an individual strategy. The third step is confronting all these personal preferences in a dealing room, facilitating transactions and trade-offs between participants. This will lead to a hybrid strategy combining features of several perspectives and a mix of projects. The fourth step is evaluation of the results of the dealing room by parliament. Their decision will then trigger a new series of decisions by private citizens either to move or to stay.

The method was first tried out in 1997, sponsored by the four main cities and a government research programme managed by the Interdepartmental Commission on Economic Structure (ICES). Later that year a second try-out was held on a regional level, sponsored by four cities in the eastern part of the country. In 1998 the Minister of Housing, Planning and Environment commissioned the foundation with organising a debate on a recent department study called 'The Netherlands in 2030'[a] Four metropolitan debates were organised, for the north, east, south and west of the Netherlands respectively. Later in the same year the Minister of Agriculture, Nature Reserves and Fisheries commissioned the foundation with a debate on the future of rural Netherlands. In slightly more than twelve months the new method was tested seven times. To be sure, all these were laboratory tests. Perspectives were more or less realistic, in the debate on The Netherlands in 2030 even formally so, but no real projects and investments were involved.

56.7 MAJOR IMPACTS OF THE EXERCISE

Since the testing of the method did not involve real perspectives and projects and participants did not represent all actors participating in reality, the direct impact on political reality has been zero. The aim of the foundation is to develop a method that parliament might use in deciding on the fifth policy document on spatial planning that had to appear in the report "People desire dwelling, dwelling in the 21st century".[b] The tests did show two weak spots in the method. The most important one: there is no decision support system available that can evaluate perspectives and projects with the same speed participants need to support their decisions. The second weak spot: projects tend to be too detailed and complicated when nearby in time, or too vague and superficial when far off. A format specific enough to make real decisions, and general enough to be useful in strategic planning was developed at the last moment for the debate on the rural system of the Netherlands.

Politically there were also reasons not to engage in experiments of this kind. First of all, a new Minister of Housing, Planning and Environment postponed the fifth policy document on spatial planning. Second, parliament decided they would prepare for the debate on the fifth policy document by evaluating the experiences with and results of the fourth policy document first. Third, the planning institutes of central government for the environment (RIVM), the economy (CPB), society and culture (SCPB), traffic (AVV) and spatial planning (RPD), commissioned by the ICES to develop an ex ante evaluation system for major public investments, did not come up yet with an operational method to be used publicly.

So the proposal of the foundation to organise for a change in parliamentary exploration of the future, after several parliamentary enquirements of the past, has to wait.
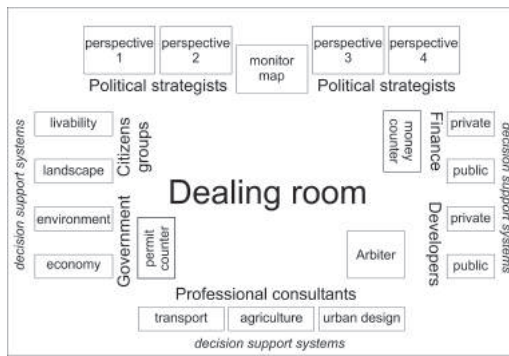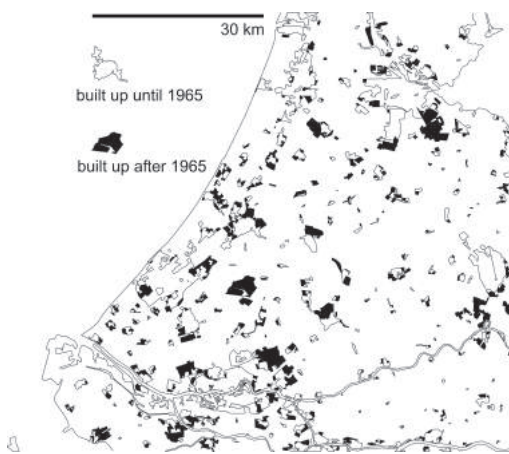

567 Projects
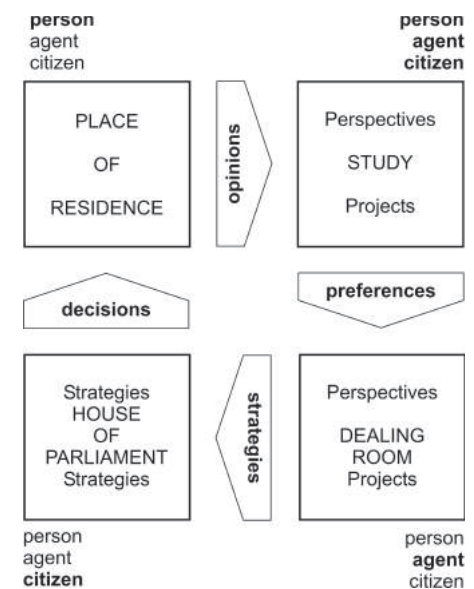
568 Decision process on planning policy

a   VROM (1998) *Nederland 2030, Discussienota Verkenning Ruimtelijke Perspectieven*.
b   VROM (2000) *Mensen wensen wonen, wonen in de 21e eeuw*.

569 Lay-out of dealing room

570 Dispersal

The contribution to strategic planning of this exercise in improving decision procedures can be summed up in a lay-out of the dealing room used in testing the method, the centrepiece between the private study for personal positioning and the assembly hall for collective evaluation. The influence on the design methods have been described (see figure 561, 562 and 564).

56.7   DESIGN TO FORGE SOCIAL ALLIANCES

To analyse the difference in perspectives you need a uniform legenda. This legenda has been developed by Taeke de Jong of the Delft Faculty of Architecture.[a] It consists of four main units (water networks, transport networks, rural and urban fields) differentiated according to size, with quantum leaps in land surfaces of 10. With this tool he analysed 25 perspectives of different public authorities and private associations, published in 1995 and 1996.[b] He then could show that indeed all of them were planning ongoing dispersal on a national scale (R=100km), in line with the fourth policy document on spatial planning report extra of 1991.

This analysis convinced Aldermen responsible for the municipal planning policy of Amsterdam, Rotterdam, The Hague and Utrecht that if they wanted to reverse this policy of dispersal, they had to join forces.

The first thing you do if you want to reverse a policy that was followed successfully for forty years is to change the concept on which it is based. The politically 'correct' concept is that there are independent cities developing independently. The reality is that the fields of influence of these cities in the west overlap and interfere and that this mutual interference weakens them because they spend energy in irritation in stead of saving energy by co-operation. Joining forces is the answer. Another politically 'correct' concept is that the Netherlands is the most densely populated country of the world and that the western part is the most densely populated part of this high density country. So the Aldermen said: "stop thinking of the delta as high density land and start looking at it as a low density city."

Starting from there, a period of a year and a half has been used to develop a perspective on the transformation of the loose collection of independent cities into an integrated urban system, to be called deltametropolis. The four Aldermen commissioned the University of Amsterdam to write them a scenario and to organise a two week combined design studio of their best designers, commission the ING-bank with a research of concentration by integration, invited David Rusk from Washington D.C. to advise them on metropolitan development strategies and spend a series of eight sessions to formulate the declaration Deltametropolis. This declaration states in 21 articles that in a European perspective the need arises to transform the cities in the delta into a deltametropolis. This declaration was issued just before municipal and parliamentary elections in 1998.

A few months later, after being re-elected, these four people – three men and a woman – convened to decide on further action, to wit: to broaden the political base; to start a research and design programme to convince the supporters of the dispersal policy that in a European field of action concentration may be more desirable and maybe even necessary; to be active in public discussion as well as in everyday negotiations on policies and projects. In February 2000, the Association Deltametropolis was formally established. The association has institutional members only. At the moment this Chapter is being written, the Association has thirty-three members: twelve cities with more than a 100.000 inhabitants, five chambers of commerce, six waterboards, four 'green' members (two farmers' associations, the Associations for Monuments of Nature and the National Recreational Association), four housing corporations, The Employers Association of Holland and a transport company. The idea is that the Association creates the opportunity to discover and invent together how this metropolitan transformation may be realised.

a   Jong, T.M. de and M. Paasman (1998) *Een vocabulaire voor besluitvorming over de kaart van Nederland.*
b   Jong, T.M. de and J. Achterberg (1996) *25 plannen voor de Randstad.*

The research and design programme concentrates on seven issues:

1. improving the water system of the delta that is now being used up to and beyond its capacity;
2. re-thinking the transport system to overcome the negative influence of low density and dispersed urbanisation on the efficiency of the transportsystem;
3. urban diversity, to use the opportunities of metropolitan development to widen the range of urban environments the delta has to offer;
4. economical synergy, analysing which clusters of economical activity establish themselves where and why, to be able to improve conditions for their earning capacity.
5. defining urban growth boundaries to conserve the water realm in the centre of the Deltametropolis and to guarantee its ongoing agricultural use;
6. the development of Leiden, of strategic importance as a node in the metropolitan transport system and
7. scanning cultural facilities and events to assess the cultural production of the Deltametropolis and its quality level.

Several reports have been published;[a] seminars on the results are held with a frequency of two per year. Findings of the studies on the water and the transport system are finding their way in research and design of others, just as the Association also uses knowledge and ideas from elsewhere.

56.9 MAJOR IMPACTS OF THE EXERCISE

The Association has been unexpectedly successful in its everyday political action on policy matters. Policy documents of the Minister of Transport and Water Management and of the Minster of Agriculture state explicity that they agree with the concept of Deltametropolis. The Minister of Housing, Planning and Environment has adopted Deltametropolis as a main issue of his fifth report on planning.[b]

The proof of the pudding will be if he accepts that in this low density and rather dispersed deltametropolis, motorways and railways have to be connected to raise the efficiency of the transport system. A political preference for railway systems may lead to a policy that pays lipservice to the Deltametropolis but stays fixed on traditional notions of public transport by rail as if the Deltametropolis had the density of Paris or London.

The Association Deltametropolis aims at reducing travel time within the metropolitan area to a maximum of one hour. This norm is only attainable if cars and public road transport with taxi's, vans and buses take a fair share in total mobility.

The contribution to strategic planning of the Deltametropolis Association has been quite impressive, keeping in mind its relatively short time of existence. From the start, 1996/97, the initiators knew they should be very selective in their choice of strategic projects, leaving the bulk of decisions where they traditionally belong. There are three criteria to select strategic projects:

- The project directly supports the main aim of the strategy: to improve integration of the metropolitan system and enlarge synergy.
- The project is conditional to many other projects and for that reason certainty should be attained about its realisation.
- The project is directly related to the metropolitan level and this level is the only right one to conceive, design and realise the project.

The first criterion refers to the importance of a strategic project, the second to the urgency of it, the third to the opportunity to take action.

In 1996 it was decided that the water-system and the transportation system should be considered strategic projects. The water system is chosen not only because of its existential
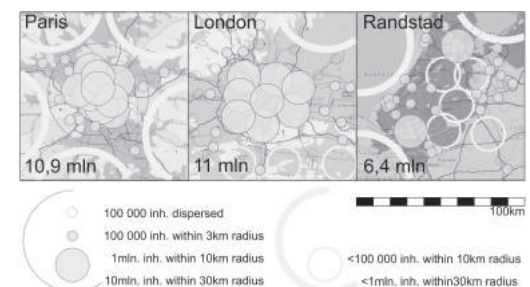
571 Density of Paris. London and Deltametropolis

a   Deltametropool, Vereniging (1999) *Personenvervoer in de Deltametropool; –* (1999) *Planning Metropolis, urban growth and social patterns; –* (2000) *Wonen in de Deltametropool; –* (2001) *Waterrijk Deltametropool.*
b   VROM (2000) *Mensen wensen wonen, wonen in de 21e eeuw.*

importance for the Deltametropolis, but also because the water system is considered to be the main structural component of the delta landscape and the cities in the delta. The water system expresses identity and image of the Deltametropolis. This identity and image is internationally recognised.

The transportation system is chosen for its direct contribution to improved integration of the metropolitan system, the need to organise the system on metropolitan level and the urgency of a major system improvement by integrating the roadsystem and railsystem that are still rather segregated.

The influence on design methods is not yet clear. The fact that the Deltametropolis Association offers a platform for informal policy discussion on perspectives has made it into a refuge for representatives of political and public and private bodies to discuss openly about quality criteria and to comment on explorative designs of transport systems and landscape transformations. By and by exploration by design is being accepted as a method to articulate an agenda for the future.

56.10 CONCLUSION

Where does the Netherlands stand today and what difference does the Deltametropolis concept make? The most important change, needless to say, is emergence of the European Union. With state boundaries having lost their rôle as economical boundaries, competition is no longer between countries, but between city-regions. Deltametropolis first and foremost is an answer to that new market-situation. The dependence of the Dutch economy on trade, transport and finance is a strength in an economy where wealth is based on worldwide exchange of material goods and Dutchmen happen to be gatekeepers of the main entrance to the European continent. Hoewever, in an economy based on information and services, the game has changed. If you are not an original source of information and if your service level is not up to world standard, you have got a problem.

Deltametropolis is a strategy to tackle this problem. The Dutch ideal of tolerance, solidarity and egalitarianism is dear of course to Dutch hearts. We should like to maintain this cultural identity as a characteristic of the European Union. The Deltametropolis declaration explicitly states that growth in size or wealth is not our biggest problem, nor foremost concern. It states that the city is an emancipation machine, a method of adding value and a school of civic culture. The Association Deltametropolis can serve as an example of this civic culture. It is an example of broad institutional participation in planning Deltametropolis; a serious endeavour to join forces to sustain, strengthen and enlarge the freedom of choice for those who live here.