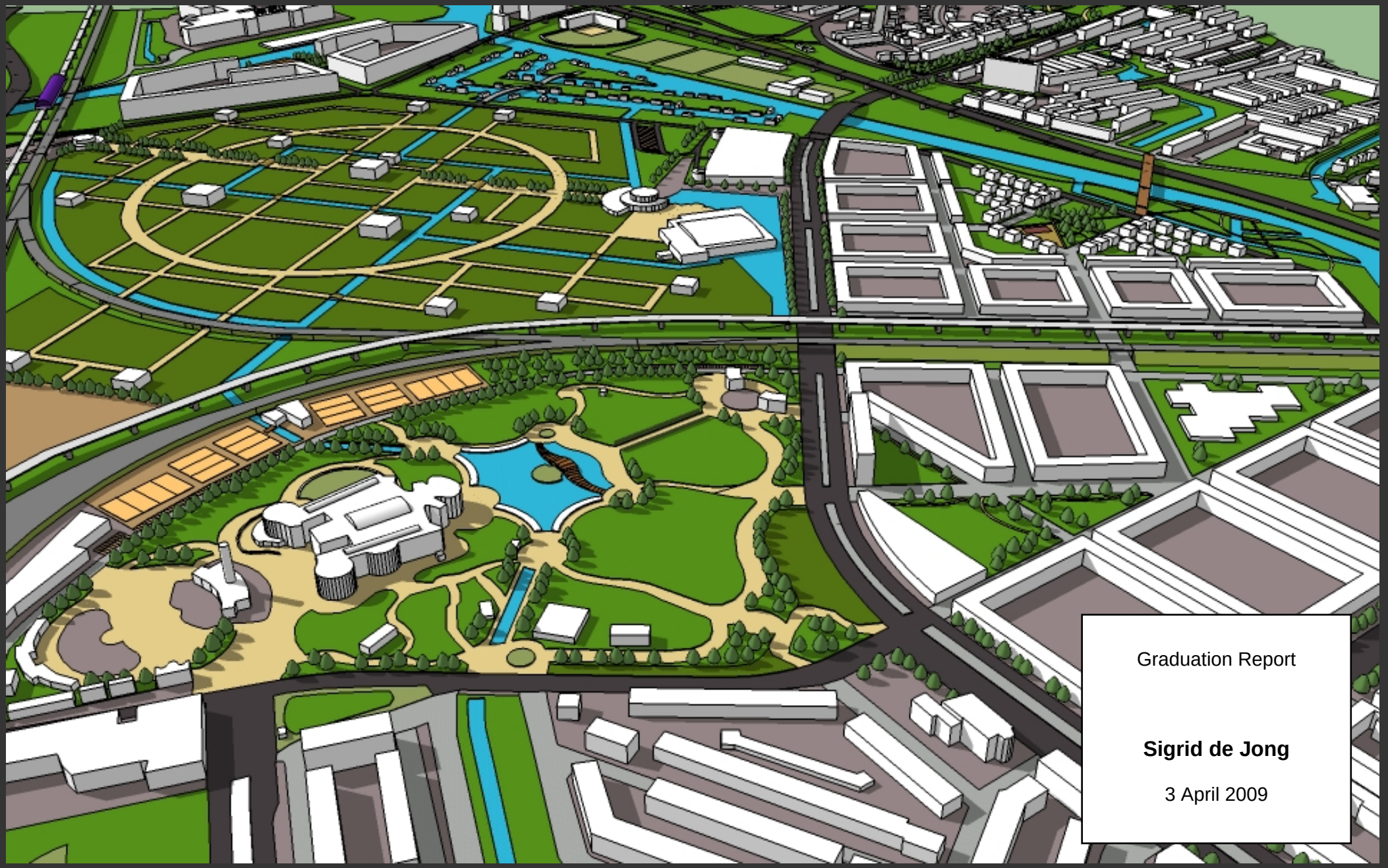
“The Clover-leaf of Blijdorp: Connecting a disconnected part of Rotterdam”

Research and design about: The revaluation of the clover-leaf of Rotterdam into an urban environment that counts!



Graduation Report

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3 April 2009

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Colofon

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Sigrid de Jong
Graduation Report for Urbanism, Faculty of Architecture, Technical University of Delft

March 2009

Mentors:
Ir. John Westrik (main mentor), Urban Compositions
Prof.Ir. Eric Luiten, Cultural History and Spatial Design
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Preface

This is the final report for my graduation project at the Faculty of Architecture, TU Delft. In February 2008, I started in the graduation lab of Urbanism and I have been working on my graduation project: “The Clover-leaf of Blijdorp: Connecting a disconnected part of Rotterdam”.

This report consists of several parts.

First of all, the ’Thesis plan’ of my graduation project:
This thesis plan describes the context of the problem field, the research and design questions, aims and methods, the theoretical framework of the project, the research and design location with a provisional functional analysis and concept, the relevance of the project, the planning in relation to the in-between and end products and an explanation of the involved disciplines of urbanism with the mentors who will supervise the graduation process.
The content of this thesis plan is the starting point for the whole graduation project, and has been used as a steppingstone to revert to, during the past 14 months.

The second part is the ‘Theoretical Paper’, which zooms in at the theory about re-use and re-allocation of monumental buildings. This subject has been researched because of the presence of a number of monumental buildings in the design area (in Blijdorp Zoo).

The third part of the report is about the research and design for the clover-leaf area in Rotterdam Blijdorp. This part has a chronological division: it tells the story from the P2 (when the thesis plan was finished) until now, and the chapters alternate between analysis and (preliminary and final) design.

During the project I have been working under supervision of Ir. John Westrik, Prof.Ir. Eric Luiten and Ir. Maurice Harteveld. I want to thank them for all the time they spent in my project and for the source of inspiration that they have been for me.

Furthermore, I want to thank Ron and my parents for stimulating me to finish my education and to start with this graduation project.
Also thanks to architectural firm ‘Moen en van Oosten’ in Rotterdam, for providing me information about plans they made in 1990 for moving Blijdorp Zoo to another location in Rotterdam. Thanks to Danny van Muster and Mr. Broekroelofs of ‘NS Poort Ontwikkeling’ for information about the railroad tracks in the direct neighbourhood of my design location. And last but not least: thanks to all my colleagues, friends, family and other interested people who supported me during my graduation period.

Sigrid de Jong,
Capelle aan den IJssel, March 2009

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1. Problem field

1.1 Introduction: the clover-leaf of Blijdorp

In the northwest of Rotterdam, there is a district called Blijdorp. On the one hand an area with popular thirties housing (the east part of Blijdorp), on the other hand an area which mainly accommodates recreational functions in different landscapes (the west part of Blijdorp). Several times, this western part is being intersected by infrastructure. Through that, the area is divided in 5 smaller parts, in the shape of a four-leaved clover (quadrant A, B, C and D) with a flower-stalk (E). Figure 1 shows the location of this clover-leaf and figure 2 shows the translation of the area into a scheme with the 5 parts.

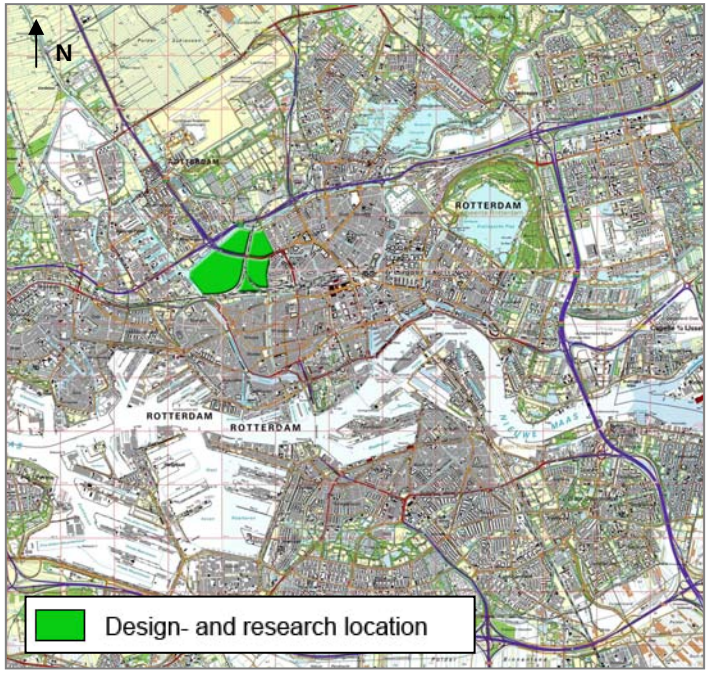

Fig. 1 | Map of Rotterdam, with the clover-leaf of Blijdorp

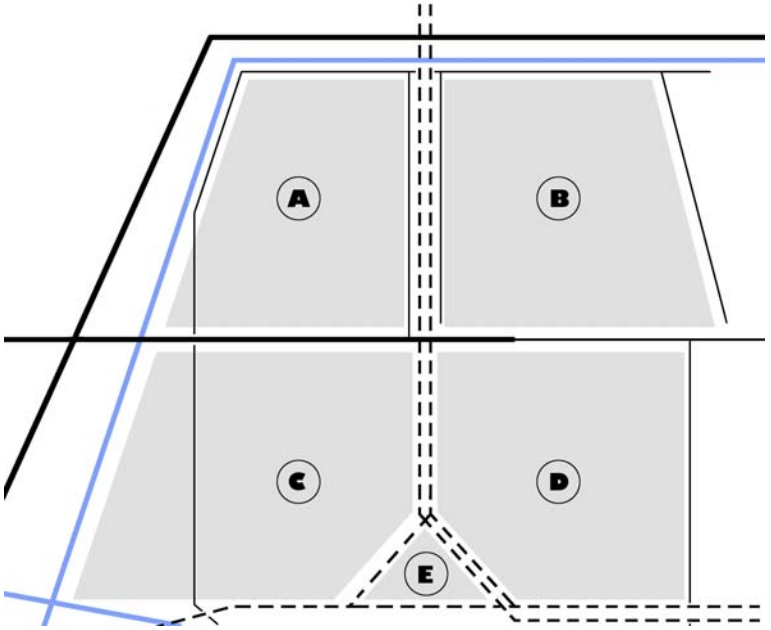

Fig. 2 | Translation of the research- and design-location into a scheme: 4 quadrants and 1 triangle

On this moment, the four quadrants (clover-leafs) and the smaller triangle are a union in a figurative way, because they share several activities. For example, spread over all 'leafs' there are two tennis courts, two parks, two areas with allotment gardens and two areas with mixed sports activities like football-grounds, a baseball stadium and a running track for athletics. The zoo of Rotterdam, Diergaarde Blijdorp, is also divided over two different quadrants. So, spread over the total clover there are a lot of similarities, which makes it on first sight an imaginary unity; you will find the same sphere on more spots.
On the contrary, in a literally way there is absolutely no unity because of the many intersections by big lines of infrastructure (highways, railroads and a canal). The four quadrants and the triangle are functioning completely independent of each other. Besides, there is hardly any visual contact possible between the different quadrants. This lack of unity between the different parts of the clover is the **first problem** of this area, defined as 'the internal lack of unity and connections' (figure 3).

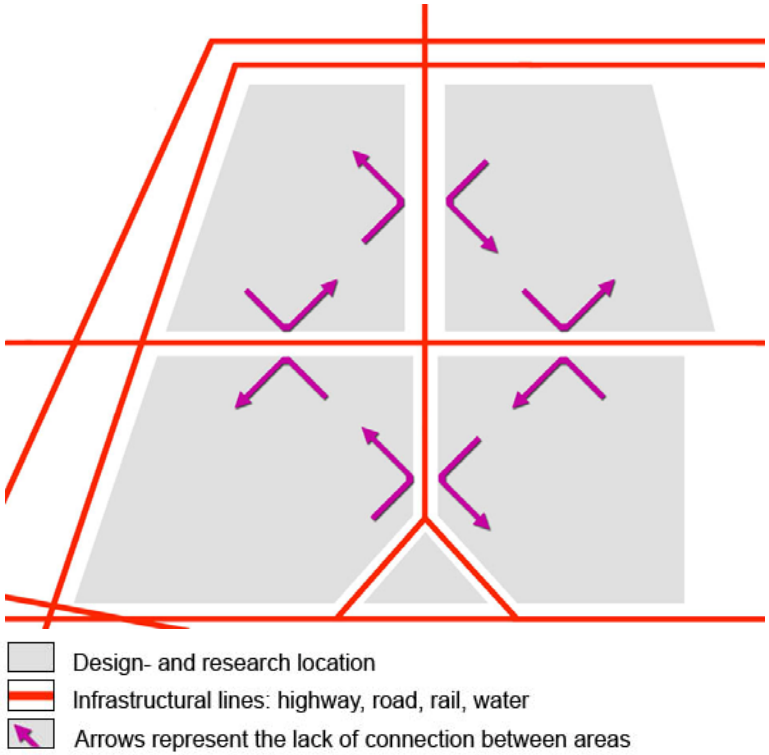

Fig. 3 | Scheme of the internal lack of unity and connections among the leafs of the clover

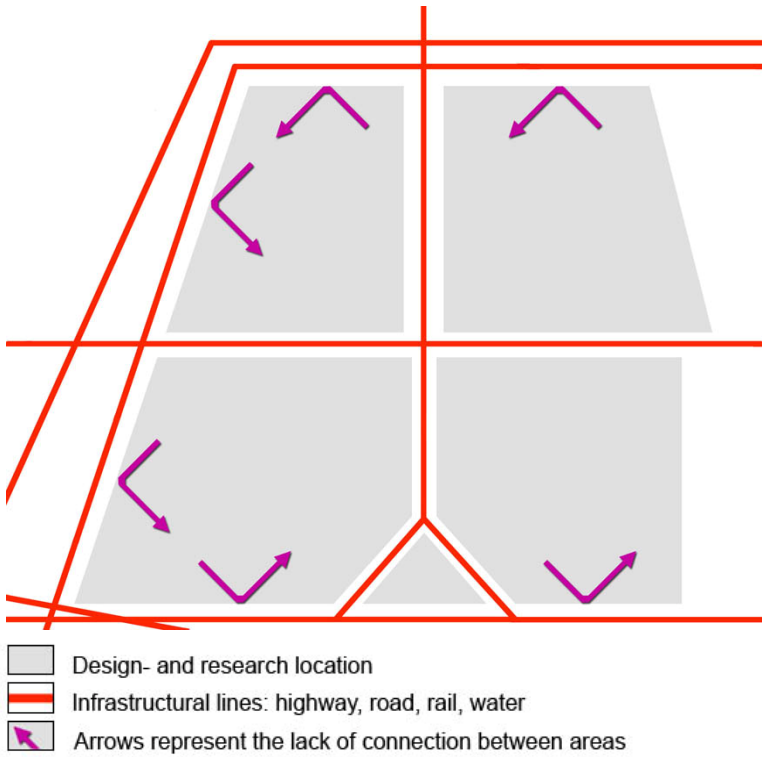

Fig. 4 | Scheme of the external lack of unity and connections between the clover-leaf and the surrounding city

The **second problem** is the relation between the whole clover-location and the rest of the city of Rotterdam, especially with the nearest parts (like the housing area of Blijdorp). In fact there is hardly any connection! Only in the northeast, at the border of the housing area and the Vroesenpark, there are some connections, and a little more to the south, at the border of Blijdorp Zoo and the housing area (figure 5). However, this is only a visual connection, because of the borders of the zoo are surrounded by a fence.
This problem is defined as 'the external lack of unity and connections' (figure 4).

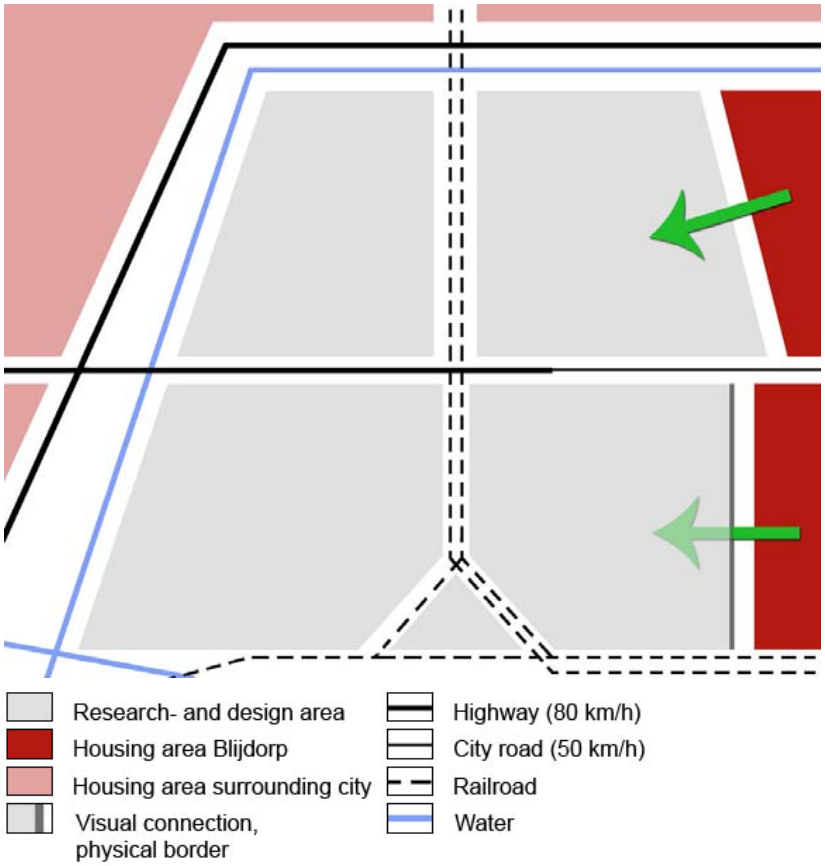

Fig. 5 | Map with the only 2 connections between city and clover

These two ‘connectivity’ problems are the starting point of this graduation project. They trigger to look closer to the clover leafs. Therefore, it is necessary to revert to the second subsection of this paragraph: the shared (or actually: ‘double’) activities among the quadrants. It is not by definition a defect, having the same kind of functions accommodated near to each other on a smaller surface. However, when researching the possibilities to improve the amount of unity, it is impossible to neglect the functions in the researched area. So, the **third problem** in this part of Blijdorp is the doubtful former development which lead to the accommodation of double functions in the area. For more details about the functions of the location, please check the map in chapter 6.

These three problems together, on the scale level of the district (higher scale level), lead to the main research question. This question concerns the improvement of the mutual connections between the clover leafs and the connection between the clover and the surrounding city of Rotterdam, by intervening and/or redesigning infrastructure, routes, functions, landscapes etcetera. This main research question will be explained more detailed in chapter 2.
Before that, the four quadrants and the triangle have to be examined in a closer way, because each quadrant has its own problems on a lower scale level. These are important because they will lead to sub-research questions (and off course as a final result: design decisions). The next paragraphs show the specific problems in each quadrant and the triangle.

1.2 Spatial problems in quadrant A

The surface of quadrant A occupies the northwest leaf of the clover. This quadrant is the most isolated one; it has no (visual and physical) connection at all with one of the other quadrants. The area inhabits many different functions, like allotment gardens, different sports activities (tennis, football, horse-riding) and a camping-site. Although, from outside this area, it is unclear that the air buzzes with activities. Only visitors with an exact goal enter this quadrant (chance visitors are sporadic over here). Besides, is has only three entrances, spread over 2 sides of the quadrant. Summarizing, quadrant A is mainly enclosed and therefore introvert, although it is very energetic. Figure 6 shows this situation schematically.

1.3 Spatial problems in quadrant B

Quadrant B is dominated by a town-park called the 'Vroesenpark'. Furthermore, there is (again) a tennis-court located, as well as a gas-station and a storage yard of municipal works. These three smaller facilities, together with the surrounding railroads and the canal, cause the main spatial problem in this quadrant; the one-sided accessibility of the Vroesenpark. Figure 7 shows schematically this situation.
The park is equipped with eight entrances, spread over three sides of the park. However, only five entrances (which are concentrated in the south and east side of the park) proceed from the housing area of Blijdorp. One entrance is adjacent to the highway and two other entrances are adjacent to closed forest on a dead-end road parallel to the railroad.
On nice (summer) days, the Vroesenpark is busy with visitors: children are amusing themselves in the playing-garden, adults are relaxing in the sun, and families are barbecuing on the lawns, etcetera. So, it is unfair to say that the Vroesenpark is not being used well enough. Only, this does not mean that the nowadays situation is the only or best situation. For example, it may be worth to explore other possibilities to improve the accessibility from other areas but Blijdorp.

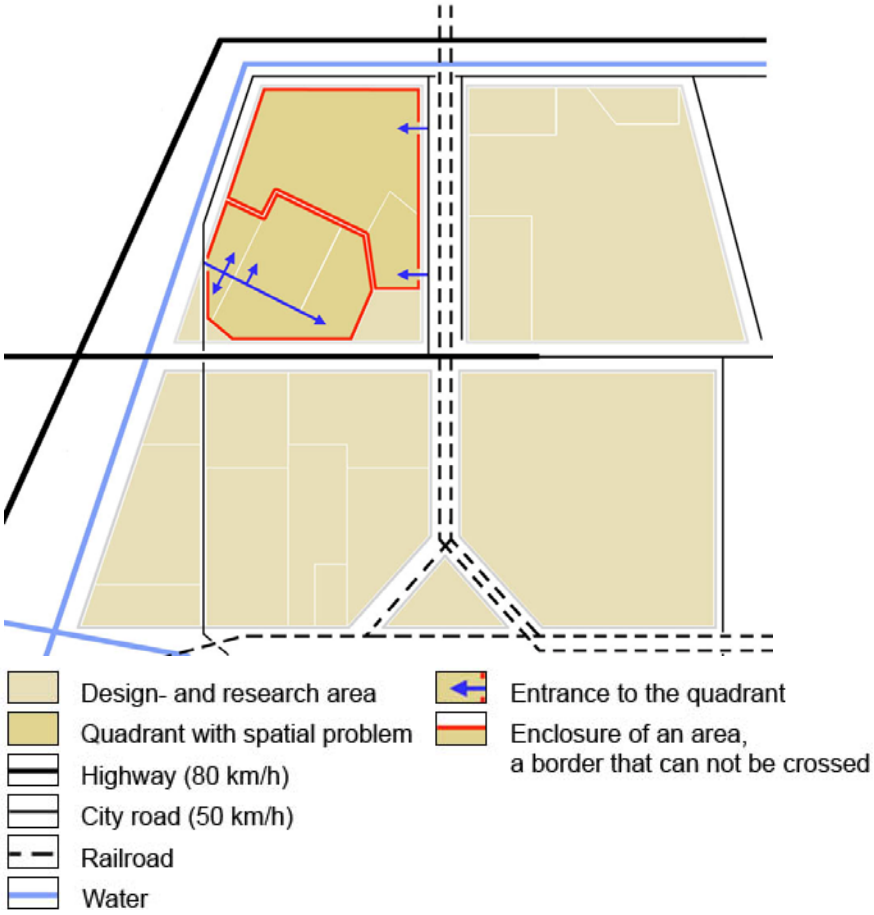

Fig. 6 | The enclosure of quadrant A with less possibilities to enter

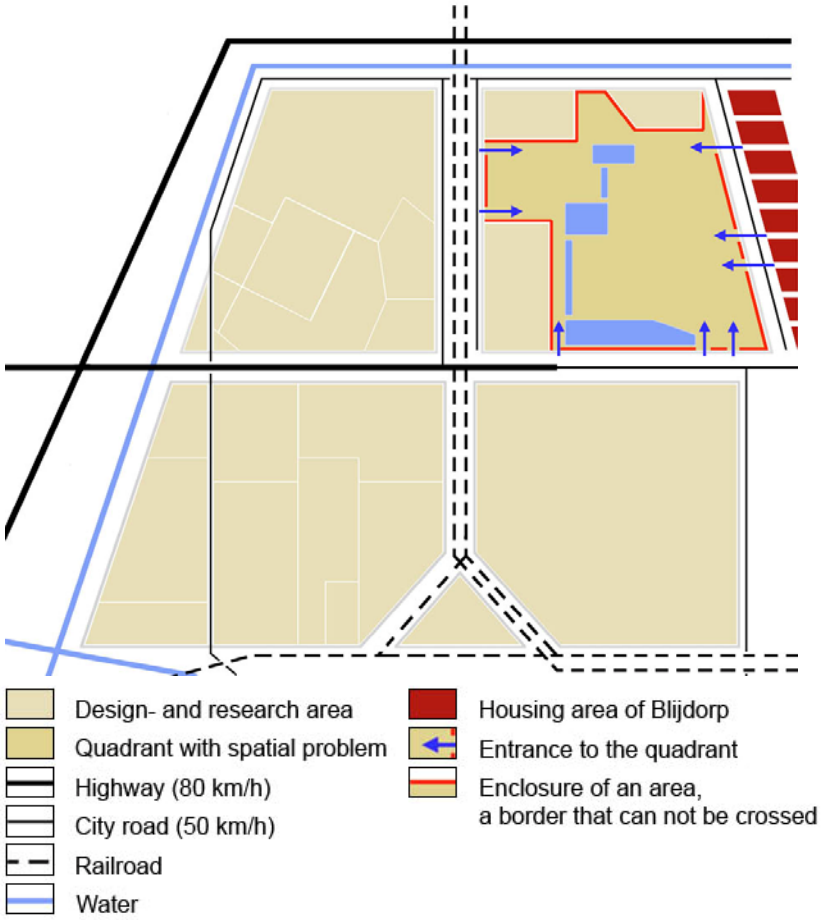

Fig. 7 | The Vroesenpark with its entrances

1.4 Spatial problems in quadrant C

1.4.1 Introduction

This quadrant is the biggest one of all clover parts and at the same time the most heterogeneous one, concerning the functions. A big part of the surface is occupied by the most recent section of Blijdorp Zoo (the zoo increased in the year 2000, par. 1.5.1). Another big part of this quadrant accommodates allotment gardens. The eastern strip of this quadrant is separated from the rest by a motorway (max. 50 km/h). Here are some special functions, like prison 'de Schie' and a marina for holiday crafts. Furthermore, the remaining surface of this eastern strip holds commercial properties. In the middle of all these activities, there remains a surface which recently (also about the year 2000) has been redesigned and reorganized. This contains an area with a lot of different sports activities (athletics, football, baseball and a gym), and right next to it the elongated shaped 'Roel Langerakpark'. In this quadrant are two main spatial problems on a smaller scale, which are described more detailed in the next two paragraphs.

1.4.2 Roel Langerakpark

The enlargement of Blijdorp Zoo in the year 2000 and the construction of the Neptunus baseball stadium in 1999 caused a necessary change for the design of the already existing Roel Langerakpark. Due to this renewal, the park now has a striking elongated shape. The walking tour is necessarily also long-drawn and ends at the entrance of Blijdorp Zoo. This is the very problem for the park: the route ends at Blijdorp Zoo, but does nót originate from a starting point where a lot of visitors could come from (like for example a train station). Summarizing, the route in the park has a clear goal but no logical source (fig. 8).

A related problem in the Roel Langerakpark is the lack of use of some open fields. The southern part of the park is the nearest to the housing area of Rotterdam-West. So when the weather is nice, a lot op people who live in that area and do not have a garden at home, use the park to relax, play, BBQ or meet their family. On those days, the southern

part of the park is crowded, but the northern part is barely used (fig. 9). Is it just too far from the housing area to walk or is the northern part not as attractive as it should be?

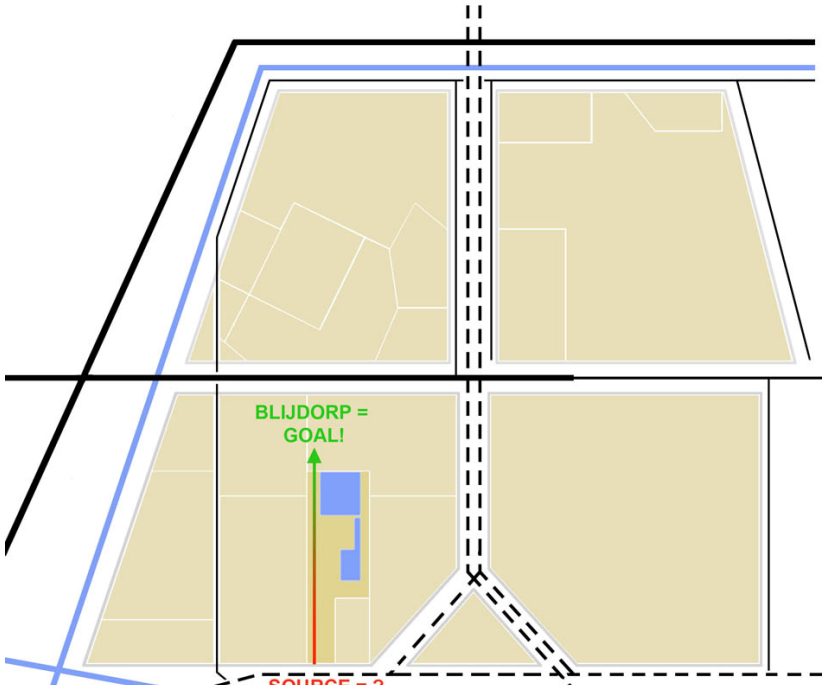

Fig. 8 | The north-south walking tour through the Roel Langerakpark

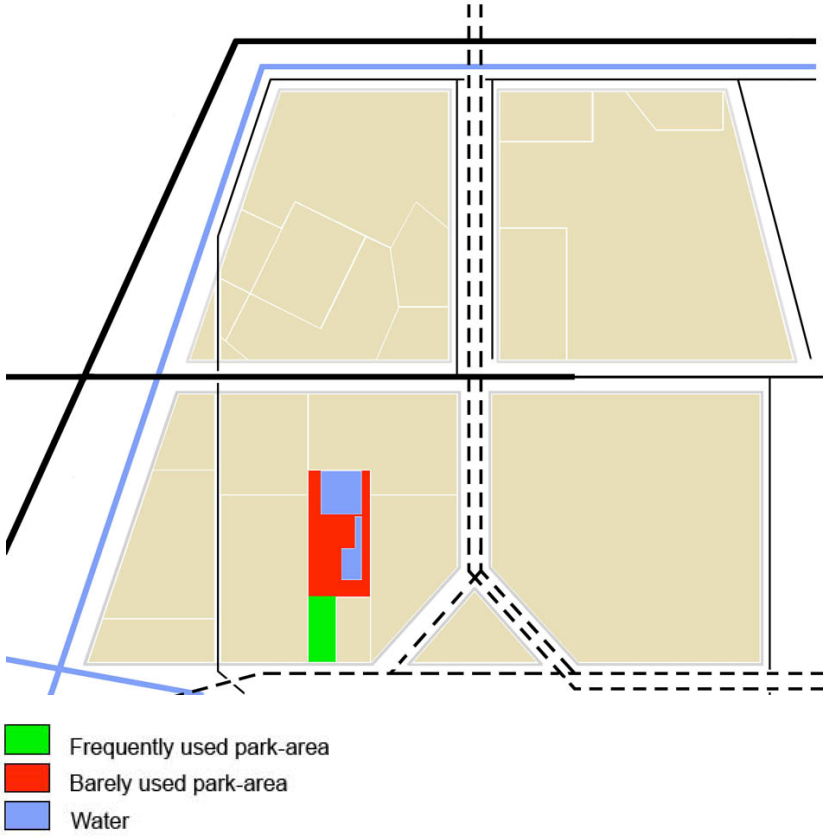

Fig. 9 | The southern area is often crowded with people, the northern part is barely being used

1.4.3 Parking problems

As yet described in paragraph 1.4.1 there are a lot of different activities situated at this quadrant. The map in chapter 6 which shows the different functions, seems to be a patchwork. Most of the functions have built up their own surface, trying to adapt to the need for parking place for their own purpose. This lead to the presence of a lot quite small parking places (fig. 10). On first sight, this seems a logical situation; everybody wants to be attractive for visitors, regarding the parking facilities (like the commercial properties, the zoo, the allotment gardens, etcetera). So they each want to have parking facilities nearby. On an average day these parking facilities may fit well enough. But on certain moments, when there is a peak-load of visitors to one place (for example when there's a big match in the baseball stadium or when it's a busy late shopping night at the commercial area), there is barely any co-operation between different parking areas. On these moments, the largest parking place, the one which is owned by Blijdorp Zoo, is inaccessible (it is closed after 18.00 hour, www.blijdorp.nl) for people who wants to make use of another facility in the neighbourhood and there is a lack of parking capacity everywhere else. This striking situation asks for a better solution. When there will be interventions in the whole clover-leaf area, this is a problem which deserves some attention; a more efficient use of square meters is useful on a (quite expensive) location near the inner-city of Rotterdam.

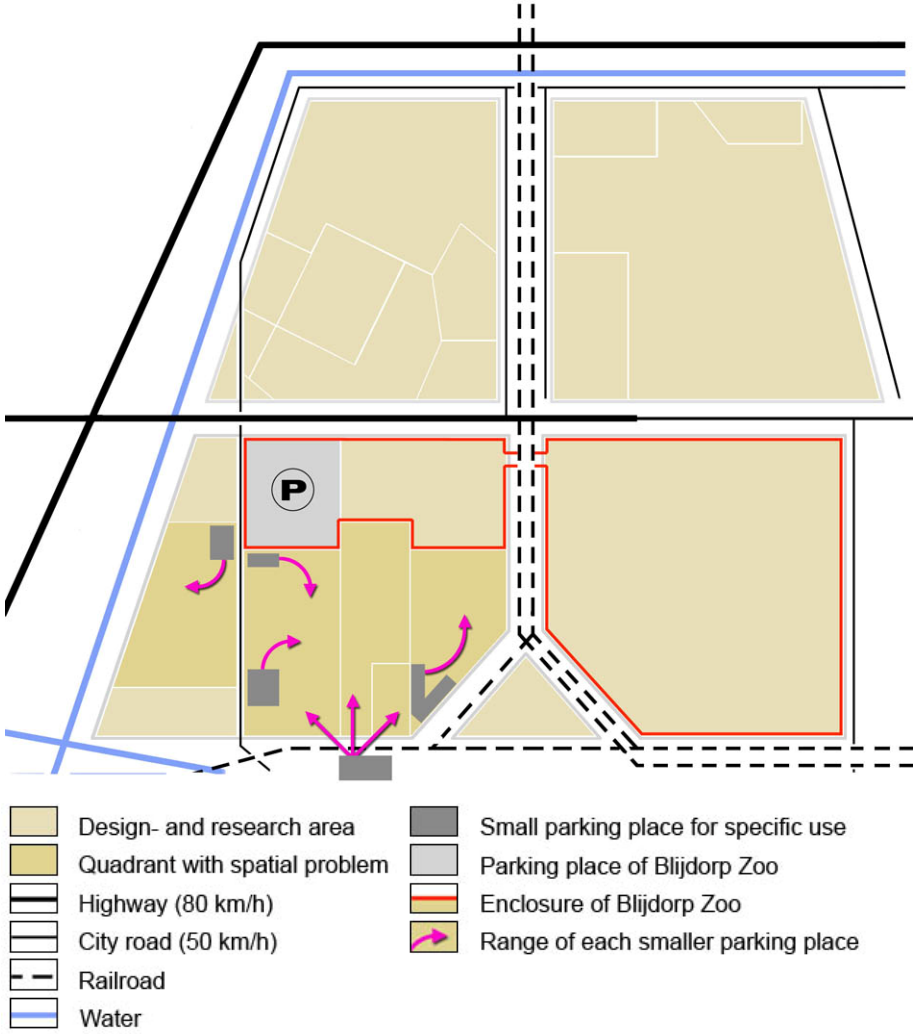

Fig. 10 | The different parking-places do not co-operate when that is necessary

1.5 Spatial problems in quadrant C & D: Blijdorp Zoo

1.5.1 Introduction

Blijdorp Zoo is probably the most famous attraction in the whole clover-leaf. It is accommodated on quadrant D and also on a big part of quadrant C (see 1.4.1). This paragraph explains the history of this zoo and sketches a context in which the spatial problems in the zoo can be placed. These three spatial problems are described in the next three paragraphs.
The first zoo in Rotterdam was opened in 1857 at the Kruiskade, in the centre of Rotterdam (fig. 11). It was not a public attraction like nowadays, but a private association; only members were allowed to enter. The area did not only accommodate animals, but also a club and a concert-room. It was very a picturesque zoo, but the buildings where the animals were living had a bad inner-climate and their cages had small dimensions. Gradually, the running costs of this zoo increased, while their earnings did not increase. Furthermore, the position of the zoo obstructed the desired north-south and east-west connection for the arising volume of traffic.

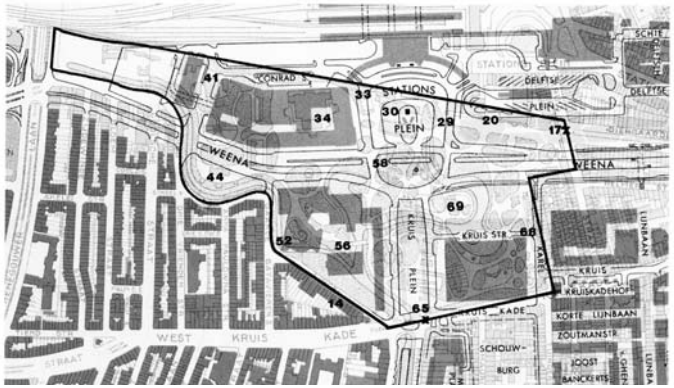

Fig. 11 | Area of first zoo in Rotterdam, 1857 (Bakker, 1985)

In 1937 they decided to move the old zoo to another location, to the edge (at that time) of Rotterdam (Vries, J. De, 1986).

This new Blijdorp zoo was opened in 1940 and the complete area is designed by Sybold van Ravesteyn, a civil engineer and architect. He designed the outside area ánd the buildings on a total surface of 17 hectares. Gradually, there was more knowledge about keeping animals, so the design of van Ravesteyn consists of larger cages with an improved inner-climate. For some decades this new zoo functioned well.
However, from the beginning of the eighties of the twentieth century, the amount of zoo-visitors showed a downward tendency. There was a lot of outstanding maintenance, dissatisfaction among the employees because of the firm leadership of director van Dam, and the housing of the animals did not anymore fulfil the modernized demands. Blijdorp Zoo was described as faded glory (Gerritsen, 2007, p. 74-75).

In 1989, Ton Dorresteijn becomes the new manager of Blijdorp Zoo: a new era had come. Under his guidance, there was elaborated a Masterplan (they started in 1988 with the Master-plan) for the renewal of Blijdorp Zoo. This Masterplan argued for more space to live for the animals, in their natural biotopes (www.zoosite.nl). Therefore, the zoo should be divided into different continents, and each animal should live in the continent where it usually lives in the wild (fig. 12).

Fig. 12 | Masterplan 1988, (0Hwww.zoosite.nl)

They started to partly renew the zoo on the original surface, particularly the northern part. But, it emerged to be impossible to re-accommodate all the animals on the available surface of the zoo, in (new or adapted) places which fulfilled the modern demands. So, there arose a lack of space during the nineties of the last century. To build new or adapted accommodation for all animals, it was necessary to expand the zoo-area.
So, in the year 2000 Blijdorp Zoo increased in size (from 17 to 28 hectare), further to the northwest of Rotterdam. This new part of the

zoo also contains a parking place for 1450 cars, because the visitors caused growing trouble to the people living in the thirties housing area next to the zoo.
In 2004, a new Masterplan has been drawn up. This plan holds the intention to solve the outstanding maintenance at the southern part of the original surface of the zoo, combined with the finishing of the expansion area. This second Masterplan will be carried out until 2015 (Masterplan II, 2004, p.2).
At first sight, this enlargement of Blijdorp Zoo looks like an intervention which meets the requirements, namely solving the lack of space in the zoo and the parking problems around the zoo. On the contrary, it caused three óther spatial problems, which will be explained in the next three paragraphs.

1.5.2 Problem I

The first spatial problem which is caused by the enlargement of the zoo, is the fact that there is a dichotomy between the original and new surface of the zoo.

Before the original zoo was built in 1940, the railroad for public transport between Rotterdam and Utrecht, was already there (two tracks). The past few years the High Speed Train (HSL) network has been expanded and therefore, two more tracks are constructed along the existing railroad. This means there is a large intersection between the original and new surface of Blijdorp Zoo. The two parts seem to be two complete separated pieces, with hardly any coherence. For example, there is only one tunnel between the two areas, and the visitors in one area are unable to have visible contact with the other area. Figure 13 and 14 represent this problem.

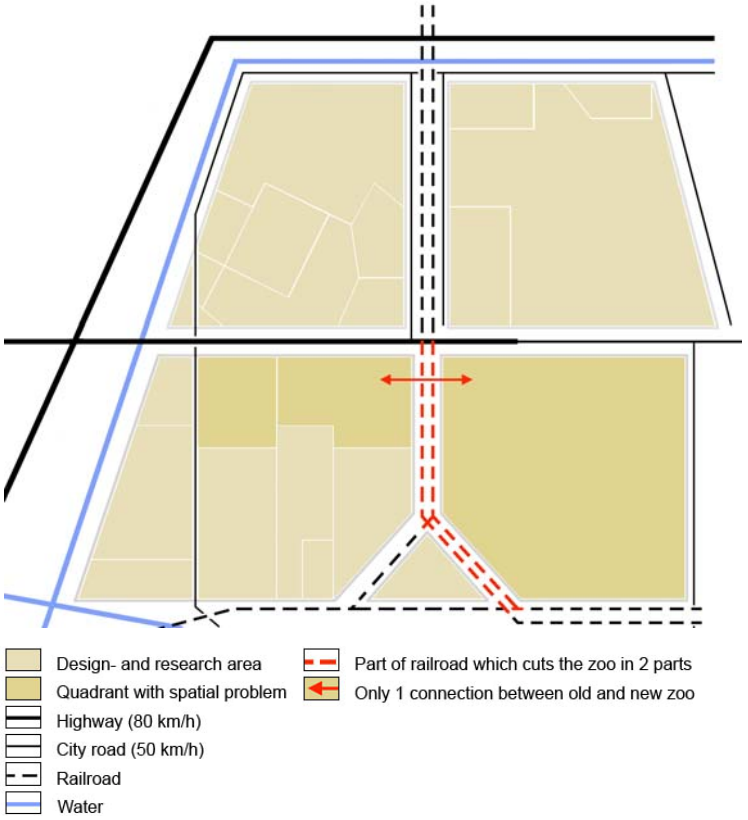

Fig. 13 | The dichotomy of the zoo

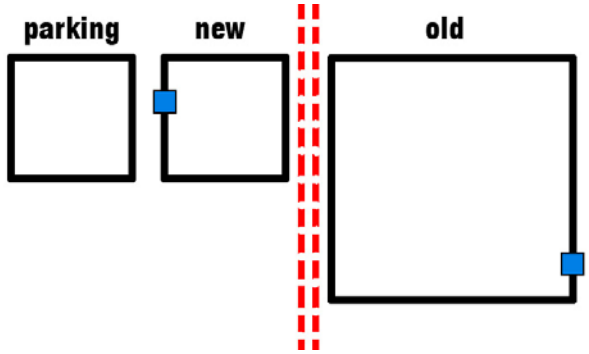

Fig. 14 | Scheme of Blijdorp Zoo with the railroad, cutting the area in two separated parts

1.5.3 Problem II

The second problem which arose from the enlargement of Blijdorp zoo at the other side of the railroad, is the elongated shape of the zoo.

80% of all visitors use the car to reach Blijdorp Zoo (www.ruimte-mobiliteit.nl). Most likely, they park their car at the new parking place next to the main entrance of the zoo. This means, these visitors have to walk a disproportionate distance to make a tour along all biotopes in the new and original zoo-area. Besides that, they are obliged to travel a part of this tour twice just to get back to their car.
In figure 15 and 16, this problem is showed. Both entrances are marked with a blue square. The route which visitors most likely walk is marked with the colour red. This makes the unfavourable elongated shape of the zoo obvious.

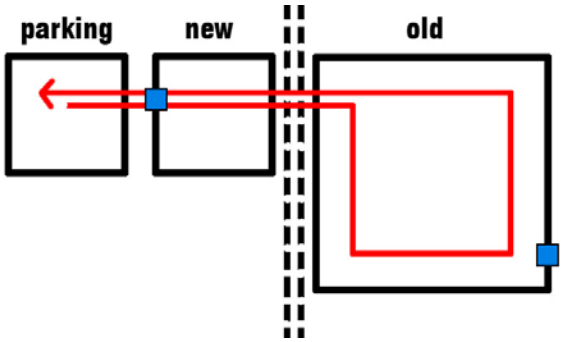

Fig. 15 | Scheme of Blijdorp Zoo with the only possible, obliged route to the parking place. The blue squares represent the both entrances.

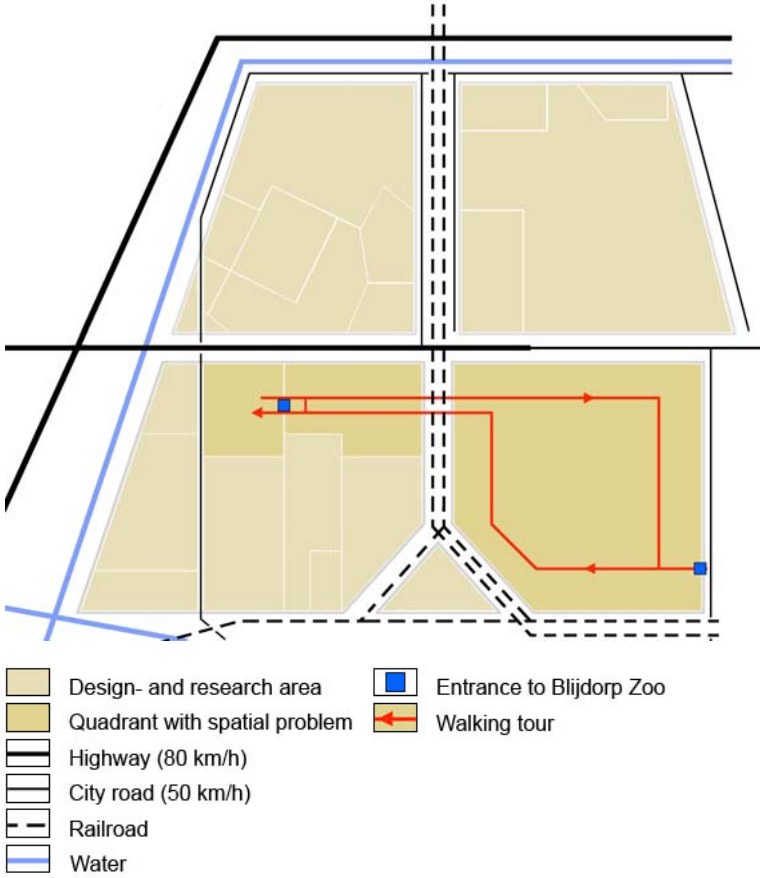

Fig. 16 | Scheme of the elongated shape of the zoo

1.5.4 Problem III

Besides these two new problems, there also remains a problem at the original zoo-site at the part which has not been renewed yet (mainly the southern part).

In the second Masterplan (2004), the future aims for this area are described, combined with a lot of outstanding maintenance from the last decades (Masterplan II, 2004, p.2). This means an unavoidable big operation (and amount of money to invest) from now until 2015 to arrange a completely modern zoo.
The scheme in figure 17 and 18 shows which part of the original zoo area has not yet been renewed.

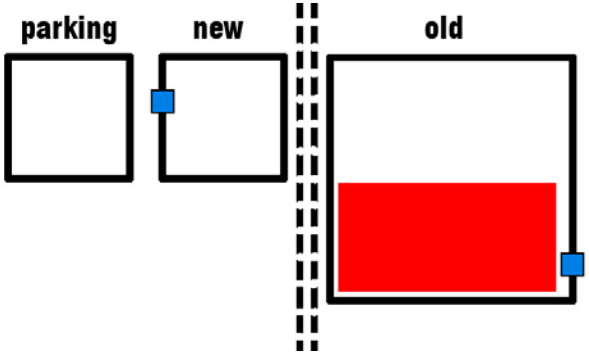

Fig. 17 | Scheme of Blijdorp Zoo with in red the part of the zoo area which needs renewal.

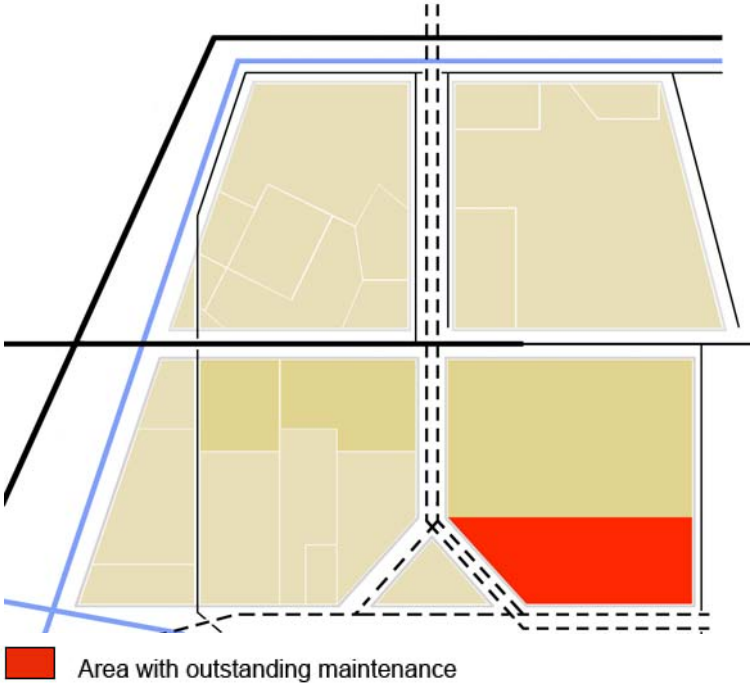

Fig. 18 | The part of the zoo which has not yet been renewed

1.5.5 Integrating the three zoo-problems

Given this necessary rebuilding (and investment) at the original zoo-location (problem 3), combined with the problems caused by the expansion in the year 2000 (problem 1 and 2), there is a specific research- and design claim on this location.
After all, when the second Masterplan just will be followed, there will only be a solution for the 3rd problem. By redesigning the whole clover leaf, there has to be special attention to the future presence of Blijdorp Zoo. Whatever the final solution will be, it is evident that all three spatial problems have to be solved.

1.6 Spatial problems in quadrant D

The original part of Blijdorp Zoo (not the extension-area) completely occupies quadrant D. The previous paragraph handled with the spatial problems in the whole zoo, the old part as well as the new part (quadrant C & D). This paragraph gives attention to just quadrant D, where the old zoo-site is accommodated. There are no real spatial 'problems' in this area; Preferable, let us call it 'points of special interest'. When the clover leaf is being re-designed, it is important to pay attention to the fact that Blijdorp Zoo is a historical monument. This means that the ground-plan as well as some buildings (fig. 19) have an important historical and cultural value and have to be preserved! So, when (after doing the complete research) it should be obvious that the zoo should be out placed and not longer be accommodated at the old site, the designer is obliged to find a suitable second life for these buildings.

An other historical fact to keep in mind, is the strip of land along the railroad in this quadrant (fig. 19). This surface has never been the property of Blijdorp Zoo itself, but the municipality owned it and the zoo had it in loan of them. From the opening of the zoo in 1940, there was always the chance that the zoo should restore this surface to the municipality. Because of that, they decided not to built expensive brick buildings over here, but only wooden buildings which would be easy to move, if necessary (Gerritsen, 2007). This 'border' is not that important anymore, but it reverts to historical facts.
When respecting the monumental buildings in the zoo, it can be worth to respect also this historical border within the zoo itself (whatever the future destination will be!).

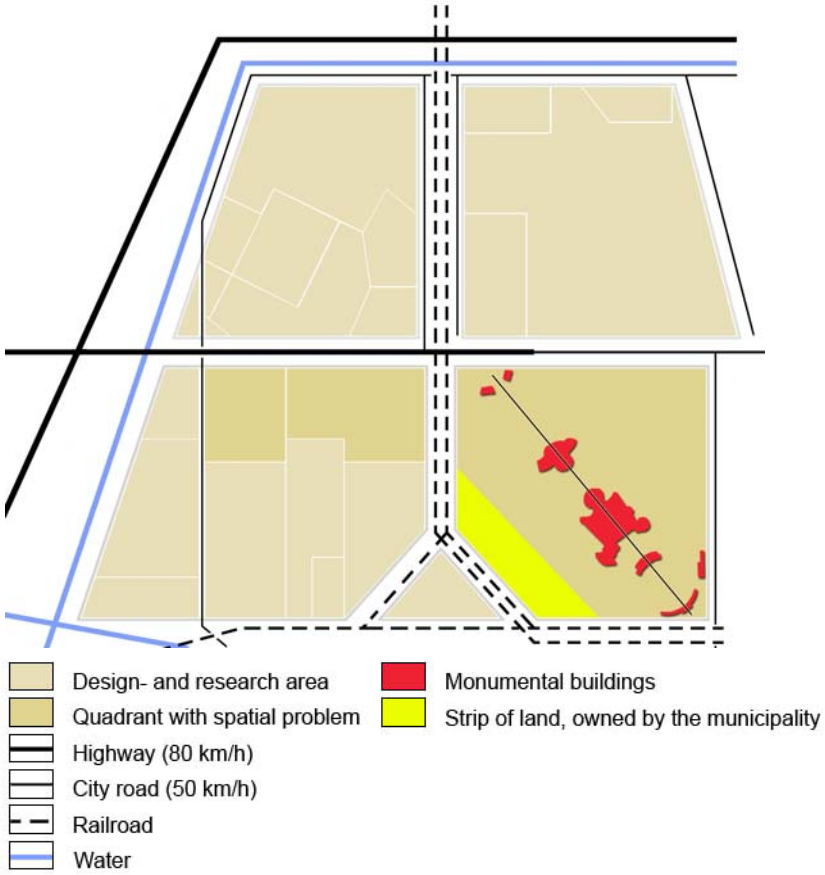

Fig. 19 | The monumental buildings and the strip of land which was owned by the municipality

1.7 Spatial problems in the railroad triangle (E)

The ‘flower-stalk’ of the clover is represented by the triangle (E) which is completely surrounded by railroad tracks (fig. 20). Actually, this is the only spatial problem in this area, but at the same time a quite important one! At this moment, the surface of this triangle is occupied by wild vegetation, has no further function at all and there is no possibility to enter this area.

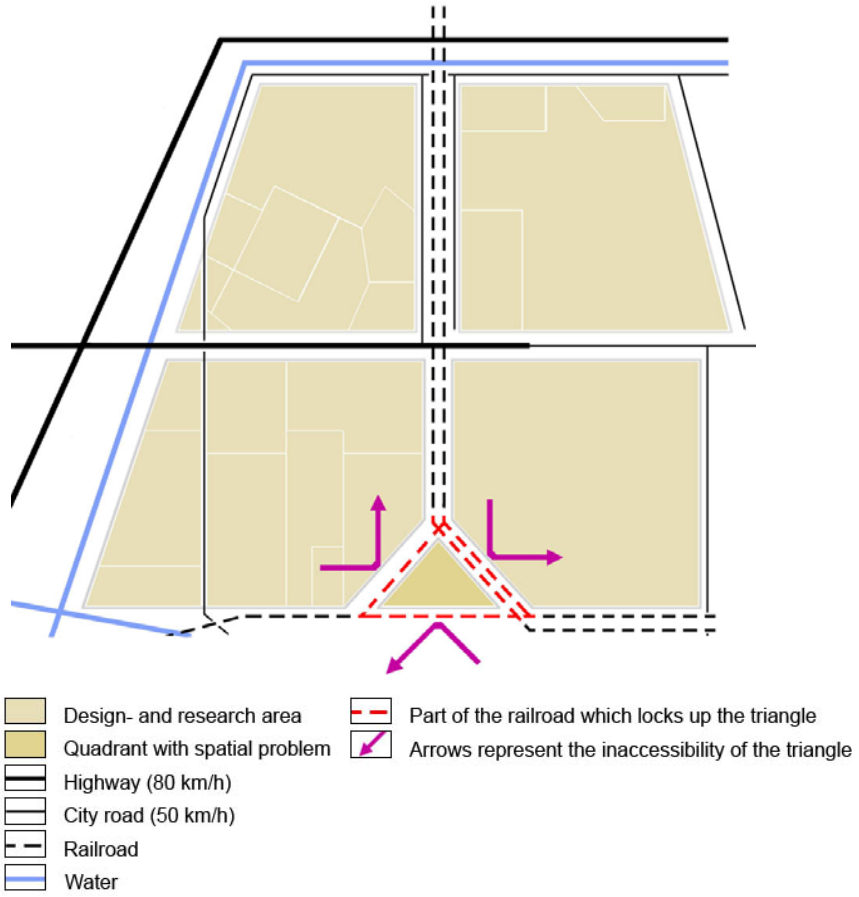

Fig. 20 | The locked up triangle between railroad tracks

1.8 Conclusion

After pointing out the spatial problems on the higher scale (the whole clover-leaf) and the spatial problems on the lower scale (in all individual quadrants), it is time to integrate all this information and to create a concrete research question. The exact aims of the research and design part of this graduation project will be explained in the next chapter.

2. Graduation objectives

2.1 Main research question

Considering the problem field on the highest scale (the scale of the whole clover-leaf and the surrounding city of Rotterdam (par. 1.1)), as well as on the lower scale (the scale of the individual clover-leafs (par. 1.2-1.7), the main research question of this graduation project is:

"Which spatial interventions can solve the problems about the lack of connectivity and unity between the clover-leaf Blijdorp and the surrounding city (external lack of connection and unity), and among the leafs of the clover themselves (internal lack of connection and unity)?"

The aim of this question is to develop a redesign for the clover-leaf area, with two main criteria:

- The infrastructure has to be improved in such a way that:
    - The leafs of the clover become less enclosed from outside (less introvert);
    - Visual contact between the leafs becomes easier;
    - Physical contact between the leafs becomes easier (internal routes);

- The functions/facilities which are accommodated in the whole clover deserve a critical view, and to be precise: the presence of a lot of double functions spread over a relative small area. This leads to decisions about:
    - Functions or activities which have to stay in the clover and which one are less bounded to this area;
    - Functions or activities which need more space than they have now;
    - Functions or activities which could join each other to avoid unnecessary double ones.

2.2 Sub-research questions

To fulfil the aim as described in paragraph 2.1, it is necessary to find answers to corresponding sub-questions (which lead from par. 1.2 up to and including 1.7):

A - Which needs, problems, demands and advantages are there exactly (besides the most evident ones, like described in chapter 1) in the clover-leaf area of Blijdorp? For example concerning:

> Leisure facilities / Car Parking / Public transport / Green facilities / Industry, business, retail / Employment / Double functions / Running plans/designs for this area in reality

B - Which needs, problems, demands and advantages are there in the surrounding urban area of Blijdorp, which remains on the east side of the clover (the thirties housing district)?
For example concerning:

> Housing / Leisure facilities / Traffic / Public transport / Green facilities / Industry, business, retail / Employment

C - Which needs, problems, demands and advantages has Blijdorp Zoo, the biggest facility in the clover, itself? (Please note: these needs, problems etc. can only concern things which can be solved by spatial interventions!)
For example regarding to:

Provisioning / Connection to traffic lines / Car parking / Accessibility

D - How can we deal with monumental buildings in Blijdorp Zoo which run a risk to lose their function (when the re-design of the clover leaf should go in such a direction that the zoo will be moved)? For instance, how to re-allocate them with another function? What kind of spatial interventions are allowed? (This question is partly linked to the Theoretical Framework, which is described in chapter 4.)

3. Approach

3.1 Introduction

To reach the aim of the project as described in the chapter before, it is necessary to get through a programme of different smaller steps of analysis. When finished all these steps, it is possible to elaborate a design for the researched area. And finally, this design can be evaluated. They seem three steps which follow each other, but in reality this is a circular process; they influence each other and revert to each other!

For this reason, this chapter about methodology in the graduation project is split into two more paragraphs: paragraph 3.2 handles about what (what subjects?) is going to be researched, designed and evaluated, and how this will be done (by which methods?). Though, paragraph 3.2 tells about the complete story about what and how, just to make you understand what the content of each step exactly is. Then, paragraph 3.3 will show in a scheme how the different steps are interrelated to each other. How do they influence each other and revert to each other during the whole process?

3.2 Methodology: the content of the different steps

The first step in this process, is to get answers to the formulated sub-questions in paragraph 2.2. To answer each individual question, different methods need to be applied:

Question A - Clover leaf area itself

Methods:
- functional analysis
- field trips to all quadrants of the clover
- interviews (e.g. Blijdorp Zoo, allotment gardens, municipality)
- statistical research (e.g. regarding the visitors of different facilities, car parking)
- historical analysis (development: why are things located as they are?)
- SWOT analysis

Question B - Surrounding urban area

Methods:
- functional analysis
- field trips to urban area of Blijdorp Rotterdam
- interviews (e.g. municipality)
- statistical research (e.g. regarding the population, employment, dimension and typology of housing, traffic)

Question C - Blijdorp Zoo

Methods:
- functional analysis
- field trip to Blijdorp zoo
- interviews
- historical analysis
- literature research

Question D - Monumental buildings

Methods:
- literature research
- reference studies (e.g. waterworks company area ‘de Esch’ in Rotterdam, Westergasfabriek in Amsterdam, Céramique area in Maastricht, etc.)

The second step will be to draw conclusions based on the gathered information in the analysis-part, having in mind the criteria for the new design (par. 2.1).

From all these conclusions can be framed a list of starting points for the design: what kind of spatial interventions have to be applied in the design to get to the aim? What are the “do’s and don’ts”?
The next step is to develop a design on the higher scale level (the level of the whole clover and the surrounding city). This is called *research driven design*, because of the analysis on which it is based. As you will see in the next paragraph, mainly during this step it will occur that there is some information missing which appears to be necessary to elaborate a design which will meet the aims. On a moment like this, it will though be necessary to revert to an earlier step (like for example the analysis, to get something missing to know); this is meant by a ‘circular process’.

More or less at the same time as the development of the higher scale design, there will be started with the design on the lower scale (the level of a (part of) a quadrant). This concerns a design for a number of important spots, spread over the clover (‘key-projects’).
This step is influencing the design on the higher scale level and vice versa (a design decision on one scale level can narrow or widen the design possibilities on the other scale)! So, again a circular process.

Finally, it is necessary to do an ex-ante *evaluation* to revert to the original situation on the Blijdorp location. What (dis)advantages would generate the new developed design compared to the nowadays situation? Obviously the new design has to solve the clear problems which are mentioned in chapter 1 (actually, that ís the research question!). However, it is not self-evident that the new developed scenario will be the best solution over all (e.g. it might solve most mentioned problems, but cause new problems which were not there before).

3.3 Methodology: the interrelated steps of the process

Like already is mentioned in the introduction, this paragraph presents a scheme in which all steps of the process are brought together, and how they are interrelated. This is the result:

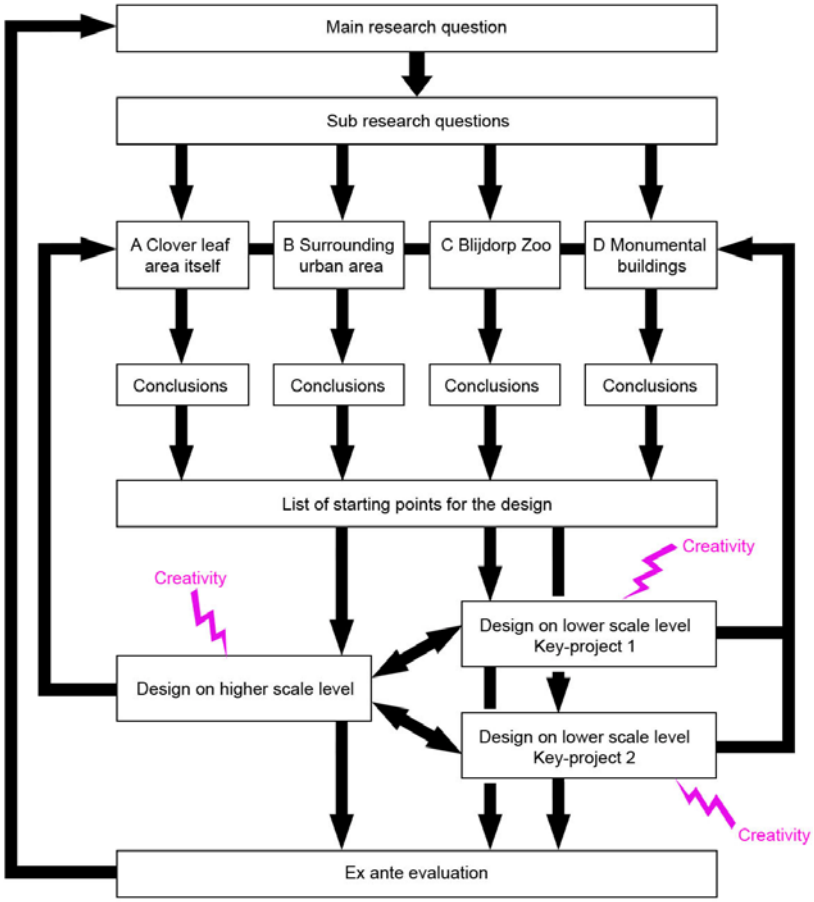

Fig. 21 | Scheme of the graduation process

4. Theoretical framework

4.1 Introduction into ‘preservation by development’

It became already obvious in paragraph 1.6 that Blijdorp Zoo holds several monumental buildings. These buildings are valuable for the appearance of the zoo; they characterize the whole area, by showing its historical roots. The map in figure 22 shows the position of the monumental buildings in Blijdorp Zoo.

Fig. 22 | Map of Blijdorp Zoo. The red buildings are monumental buildings (www.blijdorp.nl)

When the clover-leaf will be re-designed, there is a chance that Blijdorp Zoo (partly) will get another location in the clover or maybe at a total different location in Rotterdam. To be able to deal with this case, it is important to do research after the possibilities and regulations when it comes to choosing a destination for these monumental buildings. There are four main methods to deal with this question (Nelissen, 1999, p. 53-55):

- Demolition. Because of the monumental status of these cultural historical buildings, this is out of the question.
- Preserve them as disused, empty buildings. This solution does not improve the physical condition of the buildings. They only cost money and yield nothing. Furthermore, there is the thread of squatters who can attack the buildings.
- Restore the buildings and re-use them. Re-use means that the buildings will accommodate the same function as before.
- Re-use the buildings by putting another function in the buildings. This is called re-allocation and can save the buildings from falling back.

According to the procedure which the policy document ‘Belvedère’ supports (www.belvedere.nu), namely ‘preservation by development’, the fourth possible solution seems to offer the most valuable chances for these kind of buildings.

To become acquainted with re-use and re-allocation of cultural historical and monumental buildings, it is necessary to do research after the theory of these processes.

For that sake, an important part of the theoretical framework of this graduation project is about the opinions among experts about different approaches to the question: how to deal with the re-use and re-allocation of cultural historical and monumental buildings in Dutch cities?
This question will be attended in a broader outline, for example regarding the re-use of entrepôt buildings in old harbour areas, a hospital or waterworks-industry that became dated and too small and therefore moved out, etcetera.
The next paragraph contains the abstract of the paper, which will be an important part of the graduation process. The conclusions of this paper will be a toolbox for the design in the graduation project; they can recommend or discourage certain approaches to this similar question.

4.1.1 Abstract of the paper

Preservation by Development:
The re-allocation of monumental and cultural historical buildings in Dutch cities.

An abstract for the Conference: Graduation Lab Urbanism 2008, TU Delft, June 19th 2008

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Motivation
In the Netherlands occurs a lot regarding to housing, employment, traveling, nature, leisure, etc. The spatial compositions, which are inherent to these subjects, are in a continuous motion to fulfil their non-stop innovating **functional demands**. However, there are not only functional needs in urban design. Besides, also the **quality of the buildings** has to satisfy the users of the area, in order to attribute an asset to the location. The radiation of cultural historic buildings can give an urban area a surplus value (www.belvedere.nu).
During the years, a lot of these **monumental** and **cultural historic buildings** have lost their specific aim. Many times this is due to changed demands on the specific function which was established in the buildings or in their surroundings. Think about a hospital or waterworks-industry that became dated and too small, a factory which modernized or enlarged its process of production and therefore needed to remove, or a entepôt building in an area which used to be a part of the harbour and isn't in use like that anymore.
The former functions of these buildings may have left, but in a lot of cases the building itself is still there. Those buildings can contribute in a positive way to the identity of a place, but do not benefit from standing empty. Therefore, a **change of function** of these buildings can contribute to a development on economic, cultural, and spatial level.

Objective
This paper deals with the **different views on the approach of the re-allocation of cultural historical and monumental buildings** in Dutch cities: Which different opinions apply among the experts until now, regarding this re-use and re-allocation?

Relevance
In 1999, a policy document regarding monumental and cultural historical heritage was established in the Netherlands, called '**Belvedère**'. This document argues for "**preservation by development**" (www.belvedere.nu). This is a new view on spatial planning, different from the former notion (the choice between demolish the whole building or preserve it like it always has been).
This paper lays the theoretical foundation of a university graduation project at the urbanism department of the TU Delft. This project aims for a development in and around the zoo of Rotterdam, which also contains monumental buildings. This development points at a more efficient spatial organization in the zoo and in the surrounding urban area. To attain this, it might be a solution to (partly) move the zoo to another location. In that case, there will be a question about how to deal with the monumental buildings in the vacant area.
Therefore, the conclusions of this paper are a toolbox for the design in the graduation project; they can recommend or discourage certain approaches to this similar question.

Key words
Belvedere, cultural historic buildings, monumental buildings, re-allocation, functional demands, preservation, development.

4.1.2 References for the paper

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Examples of Monumental buildings in Blijdorp Zoo:

Rivièrahal
Office building
Tea-lounge

4.2 Infrastructure and public transport

Besides the theory of monumental re-allocation, there is another important theoretical issue which plays a role in this graduation project. The motive, which lead to the main research question is the presence of big lines of infrastructure through the research- and design-location: highways for cars and trains for goods and people (public transport). On first sight, this fact seems to work out negative for this location, at least regarding the lack of unity within the whole clover-leaf. On the other hand, infrastructure is a need for success of any location. When you are not able to reach a place, nobody will visit the place, nobody will invest money in activities, summarizing: there will not be any development at all.
The opposite is true in the clover-leaf of Blijdorp. This area inhabits such a lot of facilities and activities that this has to be accessible by a lot of people. Therefore, some research is necessary to obtain information about a number of principles regarding infrastructure and public transport.
At this moment, in the thirties housing area of Blijdorp an underground light rail project is being build, the 'Randstadrail'. This will connect the Central Station of Rotterdam with the Central Station of The Hague, from the beginning of 2009 (www.randstadrail.nl).
This is a specific case study to analyse, but the theoretical base of this kind of transportation has to be researched. For example: what is the reach of such a station in an urban district? And, what is the minimum distance between two stations to be effective and payable at the same time?
These kinds of questions also have to be answered regarding train stations, because of the presence of a railroad through and along the clover leaf of Blijdorp.
Only when this theoretical information is clear, it is possible to judge about the possibilities in and around the clover-leaf. Imagine: maybe the route of Randstadrail should be re-positioned to obtain a higher reach of people? Of maybe an extra train station should be the solution to improve the attainableness of some facilities in the clover leaf, like for example Blijdorp Zoo (www.atelierzuidvleugel.nl).

Summarizing: the connectivity problems in and around the clover-leaf are mainly being caused by lines of infrastructure. To solve those problems it is necessary to intervene and change the system and appearance of the infrastructure. But, to be able to make correct design decisions, the theoretical foundation has to be clear.

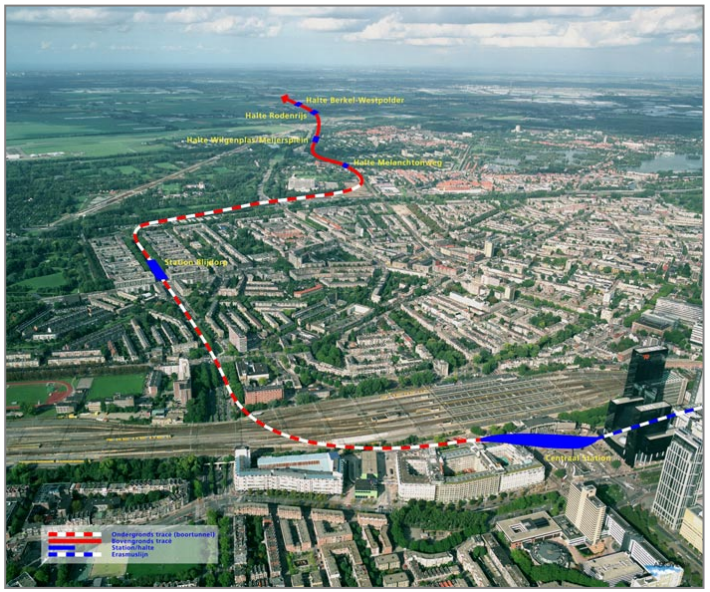


Fig. 23 | Route of Randstadrail through Blijdorp (1Hwww.randstadrail.nl)

5. Relevance

5.1 Societal Relevance

The societal relevance of this graduation project proceeds from reality. Chapter 1 yet described a lot of local spatial problems in the clover-area Blijdorp. On this moment, the area functions the way it does, but that does not mean this should be the only and the best solution for this area. An important point is the fact that every facility or activity develops his own ways to keep their attractiveness or to function better than before. Only, there is not much visible cohesion between all different facilities. At this moment 1 + 1 = 2 counts. Though, society would profit even more when the area would function like 1 + 1 = 3! To reach this goal, an integral design for the whole area can contribute.

Underneath an example of a drastic spatial change, which turned out to be a positive change for móre than just the initiator of the change (in this case not just Blijdorp Zoo but also the inhabitants of the thirties housing area next to it):
Since 1988, there has been a lot of renewals in Blijdorp Zoo (par. 1.5.1), but they were primarily pointed at the zoo itself; the surrounding urban area was of minor importance for the developers of the plans. There are hardly any examples of changes in the zoo which not only improved the zoo itself, but also the environment. The most important example is the construction of a new main entrance with a big parking place next to the enlargement of the zoo (in 2000). This decreased the inconvenience of the inhabitants of the thirties housing district of Blijdorp ánd increased the accessibility of the zoo for visitors who arrive by car (which is 80% of them (www.ruimte-mobiliteit.nl)).

The goal of this graduation project is to generate more of these positive spatial changes in the area, of which whole society can profit. For that reason this graduation project is of societal relevance.

5.2 Scientifical Relevance

Chapter 4 already mentioned the policy document ‘Belvedère’ from 1999, which argues for ‘preservation by development, when it is about monumental buildings which are not longer in use like in former days. This document is not a law or strict regulation, but a source of inspiration for policymakers, concrete design questions or spatial planning (www.belvedere.nu); Possibilities to give an area a surplus value by emphasize the cultural historical identity, by developing for example monumental buildings into something renewed: new users, new functions.

In case of a re-design of the clover-leaf area, it may be a solution to change the location of Blijdorp Zoo (to another part of the clover or to outside). In that case, the question raises how to deal with the monumental buildings in the zoo area which become vacant. The research- and design part of this concrete graduation case, contributes to the Belvedère question in general.

Fig. 24 | Scheme of the location with its functions/activities/facilities

6. Design and research location

The figure on the front page of this thesis plan shows an aerial view of the present-day situation in the clover-leaf of Blijdorp in the city of Rotterdam. The clover-leafs and the flower-stalk is marked in transparent white. The division of the area in 5 separated areas with the railroad tracks and roads in between, is very obvious on this image.

Figure 24 shows a schematic version of the whole clover, with a functional analysis by coloured areas which represent the main functions of the surface. Please realize this is just a starting point for the whole urban analysis like it is described in paragraph 3.2.

The legend at fig. 24 speaks in broad outline for itself, although it deserves some explaining comment. Therefore, underneath some facts and explication in random order:

- The housing area which is located on the east next to the clover, consists mainly of thirties housing, with almost 9500 inhabitants. The amount of owner occupied houses is 45 percent, versus 55 percent rented houses. The district of Blijdorp offers a job to 1840 people (www.rotterdamblijdorp.nl).

- There are a lot of double functions in the clover. For example the parks. The northern one is called 'Vroesenpark' and the southern one 'Roel Langerakpark'.

- There are also two allotment gardens. The southern one is called 'Streven naar Verbetering' (www.vtv-snv.nl), and the northern one 'Tot Nut en Genoegen' (www.rbvv.nl).

-The pink areas contain very different business activities; warehouses and big shops (like a do-it-yourself shop, a furniture shop and sports equipment shop), but also big storage buildings, garages and smaller offices. Next to this area, there is also a prison and a small marina.

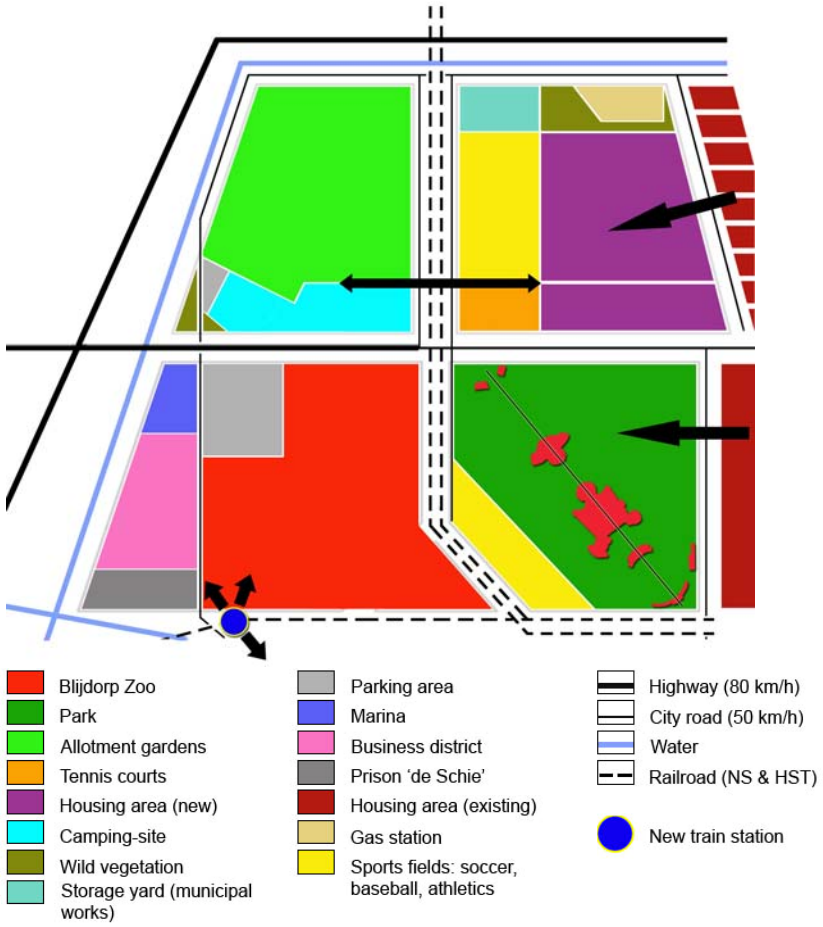


Fig. 25 | Scheme of the design concept for the location

7. Concept

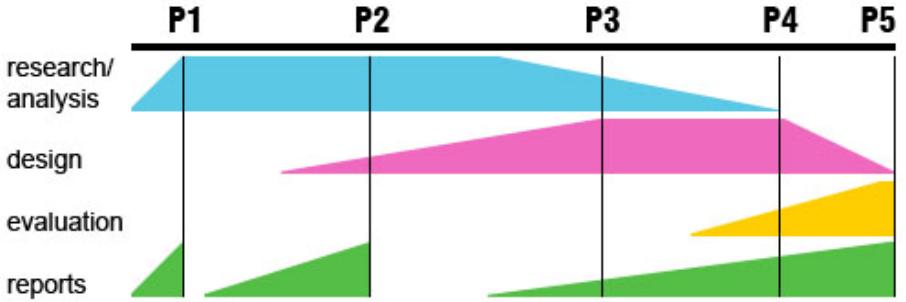
This preliminary design concept for the clover leaf originates from the changing demands on Blijdorp Zoo through the years. Because the zoo occupies the biggest surface in the clover, it deserves a lot of attention.
The design concept argues for removing the zoo partly, on such a way that the zoo will be located completely in quadrant C. The three spatial problems in the zoo (par. 1.5) will be solved by this intervention.
Before, there has been some sort of idea, but that was even more drastic. This first idea for an alternative zoo in Rotterdam, is based on a design which was made in 1990, just after the first Masterplan for Blijdorp Zoo was presented. This design argued for removing the complete zoo to the Lage Bergsche Bos in the northern part of Rotterdam and was initiated by a group of five people:
- Drs. N. Lateur, former veterinarian of Blijdorp Zoo
- Mr. C. Meuldijk, representative of building company Ballast Nedam
- Mr. W. Van Veldhuizen, visual artist
- Ir. H. Moen, architect
- Ir. J.D.A. van Oosten, architect

Their idea originated from Drs. Lateur, the veterinarian of Blijdorp Zoo, who supported the basis of the original Masterplan of Blijdorp in 1989 (natural biotopes). However, he thought it would be more ideal when somewhere else in Rotterdam a complete new zoo should be built. The design of such a zoo could satisfy the demands exactly at that moment. So, he arranged four other people who supported his idea and together they came to the proposed location in the Bergsche Bos. Moen and van Oosten made the spatial design for this new zoo and it was called 'Parkland Zoo' (Moen and van Oosten, 1990). Just like the original Masterplan for Blijdorp Zoo, it is based on the division of the area into five parts. Each part represents a continent: Europe, Africa, America, Asia and Australia.
Anyway, the choice was made to renew the original location and not to move. So the renewal began and is still going on, including the important enlargement in the year 2000. The fact that this newest part of the zoo is very recently and therefore answers the modern demands on the housing of animals. So this part of the zoo functions correctly and there is no reason to demolish this and decide to move the whole

zoo as yet. Furthermore, they have already invested a lot of money in this area. For example, the construction of the new parking place amounted about EUR 4,5 million, the Oceanium about EUR 20 million and the purchase of square meters ground did cost almost EUR 7 million (www.bds.rotterdam.nl).
Therefore, in this concept design is chosen to keep the most recently established part of the zoo, at the western side of the railroad, and rebuild the rest of the zoo also at this side of the railroad, completely on quadrant C.
The allotment gardens, the Roel Langerakpark, the baseball stadium and soccer fields should make room for the new zoo. The allotment gardens could melt together with the allotment gardens in quadrant A. Therefore, for example the tennis courts and football field in quadrant A should make room for this. All these functions (sports activities) could be placed along the railroad in quadrant D, on the strip of land which was never really owned by Blijdorp Zoo itself (par. 1.6). Like this, the choice to fill this strip apart from the rest of quadrant D refers to the history of this location.
The remaining surface of quadrant D holds the important historical monuments and because of this, very little interventions will be allowed. For that sake, the zoo-buildings will stay and be re-allocated with other functions, like a catering establishment, a museum or a community centre.
The surface around the monumental buildings will get the function of a park. This is a more ideal location for it than the place where the Roel Langerakpark and the Vroesenpark are accommodated on this moment, because it is closer to the city centre and easier to reach for a lot of people.
Quadrant B, the Vroesenpark, will change into mixed functions: some sports activities are fine, but in another setting than it are now: tennis and park are explicit split from each other (physical and visual!). Therefore, this area can be designed as a housing area with some sports activities in it. The highway will transform to a smaller city road earlier, so the barrier between quadrant B and D is smaller.
Furthermore, the railroad triangle should become more related with the rest of the clover. Research will have to point out whether all railroads around the triangle are still being used. There is a chance that the railroad which runs between the triangle and quadrant C is not being used anymore. Imagine that this becomes true during the research, this triangle-area can be added to quadrant C (the new Zoo-area). This would be a more efficient use of ground surface.
Reverting to paragraph 4.3, a new train station next to the new Blijdorp Zoo would be efficient, for visitors of the zoo as well as for inhabitants of Rotterdam-West, on the other side of the railroad.
These preliminary concept-thoughts (a ‘mind’-design) have been brought together in a map, figure 25.

8. In-between/end products & Planning

Roughly, there are three main stages of the project: research/analysis, design and evaluation. These parts will all be integrated in three reports: a preliminary thesis plan at the P1, an in-between report with the final thesis plan at the P2 and the final report at the P5. This can be visualized in a basic scheme:



This is scheme which just shows how the study time during the graduation project will be spend. On the next page, there is a more detailed explanation about what products will be generated on the five different reflection moments (the P’s).

P1	2 April 2008	Thesis plan (preliminary version) Abstract of the paper
P2	19 June 2008	Thesis plan (final version) Paper (literature research) Beginning of analysis (sub-questions A + B): - clover-leaf Blijdorp + SWOT - surrounding urban area - theory about monumental Building policy (Belvedère) Conclusions of analysis (part I) ↓ P2-report
P3	autumn 2008	Completion of analysis (sub-questions C + D): - Blijdorp Zoo - Monumental buildings in area Conclusion of analysis (part II) List with starting points for the design Conceptual design on high + low scale
P4	December 2008	Improved detailed design on high + low scale level Concept ex-ante evaluation ↓ Concept final report
P5	February 2009	Final detailed design Completion of ex-ante evaluation ↓ Final report

9. Involved disciplines and mentors

Given the problem field, research and design questions and location of the project, the involved disciplines of urbanism and mentors in this project are:

- *Urban Compositions*, because of the redesign of an urban area in Rotterdam (on a high and middle scale level). The involved mentor for this discipline is Ir. J.A. Westrik.

- *Landscape architecture: Cultural history/Belvedere*, because of the presence of monumental buildings in the area which will be redesigned. The involved mentor for this discipline is Prof.Ir. E.A.J. Luiten.

- *Urban design*, because of the redesign of an urban area on the middle and lower scale; Determining the spheres and looks of the public and private space; how does the design work? The involved mentor for this discipline is Ir. M.G.A.D. Harteveld.

PART II - Theoretical paper

Preservation by Development:
The re-allocation of monumental and cultural historical ensembles of buildings in Dutch cities

A paper for the Conference: Graduation Lab Urbanism 2008, TU Delft, June 19th 2008

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Preface

This paper forms a part of the education of the Msc-3 semester at the Urbanism lab at the Faculty of Architecture at the TU Delft. It reflects one of the theoretical subjects behind the personal graduation project. In my case this is the re-arrangement of the so called ‘clover-leaf’ area in Rotterdam Blijdorp. This area accommodates Blijdorp Zoo with a number of monumental buildings in it. In case of a removal of the zoo, these buildings have to be preserved. Preserving is one thing, but to re-allocate them is much more complicated. Therefore, this paper represents the theoretical basis of the re-allocation of ensembles of monumental buildings in Dutch cities in general.

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Contents

Abstract

Preservation by Development:
The re-allocation of monumental and cultural historical ensembles of buildings in Dutch cities

An abstract for the Conference: Graduation Lab Urbanism 2008, TU Delft, June 19th 2008

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Motivation

In the Netherlands occurs a lot regarding to housing, employment, traveling, nature, leisure, etc. The spatial compositions, which are inherent to these subjects, are in a continuous motion to fulfil their non-stop innovating **functional demands**. However, there are not only functional needs in urban design. Besides, also the **quality of the buildings** has to satisfy the users of the area, in order to attribute an asset to the location. The radiation of cultural historic buildings can give an urban area a surplus value (www.belvedere.nu).
During the years, a lot of these **monumental** and **cultural historic buildings** have lost their specific aim. Many times this is due to changed demands on the specific function which was established in the buildings or in their surroundings. Think about a hospital or waterworks-industry that became dated and too small, a factory which modernized or enlarged its process of production and therefore needed to remove, or a entepôt building in an area which used to be a part of the harbour and isn't in use like that anymore.
The former functions of these buildings may have left, but in a lot of cases the building itself is still there. Those buildings or ensembles of buildings can contribute in a positive way to the identity of a place, but do not benefit from standing empty. Therefore, a **change of function** of these buildings can contribute to a development on economic, cultural, and spatial level.

Objective

This paper deals with the **different views on the approach of the re-allocation of cultural historical and monumental ensembles of buildings** in Dutch cities: Which different opinions apply among the experts until now, regarding this re-use and re-allocation? These opinions can be classified into six F-factors which determine a project to be failed or to be successful: fool, functionality, philosophy, finance, flow and phasing.

Relevance

In 1999, a policy document regarding monumental and cultural historical heritage was established in the Netherlands, called '**Belvedère**'. This document argues for "**preservation by development**" (www.belvedere.nu) . This is a new view on spatial planning, different from the former notion (the choice between demolish the whole building or preserve it like it always has been). This paper lays the theoretical foundation of a university graduation project at the urbanism department of the TU Delft. This project aims for a development in and around the zoo of Rotterdam, which also contains monumental buildings. This development points at a more efficient spatial organization in the zoo and in the surrounding urban area. To attain this, it might be a solution to (partly) move the zoo to another location. In that case, there will be a question about how to deal with the monumental buildings in the vacant area.
Therefore, the conclusions of this paper are a toolbox for the design in the graduation project; they can recommend or discourage certain approaches to this similar question.

Key words

Belvedere, cultural historic buildings, monumental buildings, re-allocation, functional demands, preservation, development.

1 Introduction

1.1 Motivation

In the Netherlands occurs a lot regarding to housing, employment, traveling, nature, leisure, etc. The spatial compositions, which are inherent to these subjects, are in a continuous motion to fulfil their non-stop innovating functional demands. However, there are not only functional needs in urban design. Besides, also the quality of the buildings has to satisfy the users of the area, in order to attribute an asset to the location. The radiation of cultural historic buildings can give an urban area a surplus value (www.belvedere.nu).
During the years, a lot of these **monumental** and **cultural historic buildings** have lost their specific aim. Many times this is due to changed demands on the specific function which was established in the buildings or in their surroundings. Think about a hospital or waterworks-industry that became dated and too small, a factory which modernized or enlarged its process of production and therefore needed to remove, or a entrepôt building in an area which used to be a part of the harbour and isn't in use like that anymore. Many cities have lost their original employment to other regions in the country (Spaans, 2004, p. 346). The former functions of these buildings may have left, but in a lot of cases the building itself is still there. Roughly, there are four options to deal with these kind of buildings.
The first option is to keep them unoccupied. In general, this only causes problems: the costs of maintenance will go on, while there is no income from the buildings, like rent. Furthermore, an empty building runs the risk to be squatted or to become a victim of vandalism.
The second option is to demolish the buildings and rebuild a new one, which meets all requirements of the new user. However, this means a loss of cultural value, like historical architectural (details of) buildings.
Third option is to restore the buildings and re-use them. Re-use means that the buildings will accommodate the same function as before.
The fourth option is to re-allocate the buildings. In this case, there will be a change of function, after the building has made suitable in a technical way. This option guarantees the conservation of the particular sphere and character of the buildings. These buildings or ensembles of buildings can contribute in a positive way to the identity of a place by their exterior. So, in this case, the area where these buildings stand, will keep his cultural historical identity (Nelissen, 1999, p. 53-55).
This fourth option is the most complicated one, but simultaneously offers the most interesting perspectives for the buildings itself ánd the surrounding area. Therefore, this is the field of activity where 'project group Belvedère' is working on. In 1999, this project group established a policy document regarding monumental and cultural historical heritage in the Netherlands. This document argues for "**preservation by development**" (www.belvedere.nu). This is a new view on spatial planning, different from the former notion (the choice between demolish the whole building or preserve it like it always has been, with or without a function in it).

1.2 Research question

This paper deals with *the different views on the approach of the re-allocation of cultural historical and monumental ensembles of buildings in Dutch cities: Which different opinions apply among the experts until now, regarding this re-use and re-allocation?*
The intention of this question is to do literature research after different criteria, which are factors of success and failure, regarding the re-allocation of cultural historical and monumental ensembles of buildings.

1.3 Relevance

This paper lays the theoretical foundation of a university graduation project at the urbanism department of the TU Delft. This project aims for a development in and around the zoo of Rotterdam (Blijdorp), which also contains an ensemble of monumental buildings. This development points at a more efficient spatial organization and a better connectivity in the so called 'Clover-leaf' of Blijdorp: four areas near to each other, almost completely separated from each other by railroads and highways. To attain this improvement, it might be a solution to (partly) move the zoo to another location. In that case, there raises the question about how to deal with the monumental buildings in the vacant area.

Therefore, the conclusions of this paper are a toolbox for the design in the graduation project; they can recommend or discourage certain approaches to this similar question.

1.4 Structure of the paper & projects

After this introductory chapter, there follows a chapter (2) in which more general information about monumental and cultural historical buildings is given; some facts to “set the scene”. Furthermore, the six F-criteria which determine a project to be failed or to be successful: fool, functionality, philosophy, finance, flow and phasing. These criteria are used in chapter 3, 4 and 5, to channel the opinions of the experts about three different re-allocation projects in the Netherlands. It concerns the Westergasfabric in Amsterdam, the DWL area in Rotterdam (a waterworks-‘fabric’) and the former territory of Céramique (an earthenware factory) in Maastricht.
These projects are industrial heritage, which isn’t the same as a zoo. In spite of this difference in functions, these projects have an important similarity with the ensemble of buildings in Blijdorp Zoo; their position in the city. All mentioned projects were built at the edge of the city centre (in those days). Gradually, cities expanded more and more, until the locations of the projects were not longer the end of the city, but due to these later developments, the project-locations almost became the city centre itself (Cüsters, 1999, p. 39). So, the role they play in urban life is similar; for the development of new functions (supply and demand), as well as the spatial setting (like for example the accessibility).
Chapter 6 describes the conclusions which can be drawn from the earlier chapters. In chapter 7, these conclusions are translated into recommendations and discouragements (the so called “do’s and don’ts”) for the re-allocation of the ensemble of monumental buildings in general (for example Blijdorp Zoo).
An important marginal note is the fact that each re-allocation project is a unique one, with different architectural and historical characteristics. Besides, each monument has been built for a specific function is placed on a specific location. The surroundings, which influence the buildings, are all different (Nelissen, 1999, p. 107). Because of this, it is impossible to formulate a list of fixed facts about (im)possible choices and their positive or negative results. So, the recommendations and discouragements that will follow from this literature review are no obligations to surrender. A statement from the financial world represents exactly their value: “Achieved results from the past, won’t give any guarantee for the future.”

2 Re-allocation of monuments & Criteria to judge projects: the 6F-model

2.1 General opinions about monuments and re-allocation

What is actually the definition of a monument? The Historic Building Trust (Monumentenwet) describes it as: “all goods (for example buildings) which have been constructed at least fifty years ago, and which are a common good, due to their beauty, their meaning for science of their cultural-historical value” (Nelissen, 1999, p. 38).
This paper handles mainly with industrial buildings. Often, one of their problems is the lack of beauty by the common opinion. A socially broad base is missing. Therefore, the re-allocation of such a building is most of the time initiated by a few citizens or by the owner of the building. The municipality often plays a following role (Crols, 1996). So, industrial heritage is not being seen and treated like heritage, but as lumber (Boer, 1995, p. 7). Another problem is the fact that a real estate developer often jumps to conclusions about re-allocation of this kind of buildings: A lot of fuss, a small return (Boer, 1995, p. 12). Besides, a re-allocation project often asks for a long preparation time. This is also a reason why real estate developers won’t invest in such projects: the market is going up and down during the years, so they would rather not do very long-term investments (Boer, 1995, p. 13).
All these problems and prejudices of people against re-allocation of cultural-historical buildings would almost sketch the idea that a successful re-allocation project is rare, because of the lot of negative thoughts about such a process. Nevertheless, there are many successful transformations until now. To balance the thoughts about re-allocation, also some important positive views: Re-allocation of industrial heritage is enrichment and historical deepening of the heterogeneous built-up area (Boer, 1995, p. 3). Variety means the presence of taste and identity; uniformity means a loss of taste and identity. For example: nowadays, from outside it is only possible to know what kind of enterprise is settled in a certain fabric, by looking at the nameplate on the front. In the past, there was often a synthesis between functionality and creativity. The result of that was a building which showed its own character by using certain materials, decoration or location-choice (Boer, 1995, p. 7). This ideological thought is again winning ground in the Netherlands. There is an increasing amount of enterprises that are willing to settle itself in a building which differs from the nowadays standard buildings. They prefer to have a recognizable ‘face in the market’. This is not just idealism, but also a well thought-out marketing strategy (Boer, 1995, p. 10).
Furthermore, the environmental effects of demolishing and rebuilding are much heavier than the re-allocation of an existing building by technical adjustments (Boer, 1995, P. 10).
Having these positive and negative views in mind, it is time to switch over to the theory of judging the degree of success of a project.

2.2 The theory about the 6F-model

PIE is short for ‘Projectbureau Industrial Erfgoed’, translated freely into ‘Project Agency for Industrial Heritage’. In 1995, they introduced a method, based on six criteria which determine the chance of a project to fail or to become successful. All these criteria start (in Dutch) with an ‘F’ (or ‘Ph’ in English), and therefore this method is called the ‘6F-model’ (Nelissen, 1999, p. 123 and Boer, 1995, p. 23). The next six paragraphs describe the meaning of each criterion. These criteria are being used as a backbone to channel the different opinions of experts among the three re-allocation projects (in chapter 3, 4 and 5).

2.2.1 Fool

“When there’s no fool who wants to dedicate oneself to a project, it will not succeed.” This one-liner is often heard when it comes to re-allocation of cultural-historical or monumental buildings. The task of this fool is a heavy one, but he can not be missed in the whole process. As long as it is not self-evident for municipalities to do research after possibilities of re-allocation for a building which fells vacant, the role of this initiator is crucial (Nelissen, 1999, p. 125).

2.2.2 Functionality

Ir. Bleker states: “The functionality of a building is being determined by the building itself ánd its surroundings: what is the quality of the location and which functions are achievable (from an economical view)?” (Boer, 1995, p. 13).
It is important to start as early as possible with research after possible new users for a big monument. Owners and municipalities often do not

have enough perception regarding the possibilities of re-allocation. Most of the time, neither the potential new users have an idea about accommodating themselves in a monumental building which is out of the ordinary. The quote “supply creates demand” (Nelissen, 1999, p. 126).

2.2.3 Philosophy

The philosophy can be endorsed as the moving force behind a project. Why should a certain monument be worth to preserve by re-allocation? When there is a strong philosophy, this will be a binding factor between all participants. Every involved party has to be aware of the unique historical details and qualities of the building(s). This awareness creates a strong social basis. The better the philosophy behind a project is, the bigger is the chance for success (Nelissen, 1999, p. 126).

2.2.4 Finance

The previous three criteria are together partly responsible for the failure or success of a re-allocation project. However, this criterion, finance, can be the end of the line on its own! It is crucial for the success of a project to have the financial part guaranteed. At the same time, this is one of the hardest parts of a whole project. Real estate developers are not easy to get interested, especially when the project aims on just one specific user. They are still prejudiced about the costs of re-allocation; they estimate the construction of new buildings cheaper. Nevertheless, practice proves the opposite most of the time. Besides, these kinds of projects often are dependent on subsidy from the state, province or municipality. So this means a shared responsibility for the authorities and the business world. Once the financing has difficulties and will not be straightened out, this means a definitive end of the line, even when the other 5 criteria are very well fixed (Nelissen, 1999, p. 127).

2.2.5 Flow

The flow of a project means the quality of cooperation between all participants. This becomes easier when there is a clear philosophy (2.2.3) and when all parties are capable and qualified well enough to influence the project (Nelissen, 1999, p. 128).

2.2.6 Phasing

Re-allocation projects are complicated and long-term processes. It is necessary to phase the whole process in smaller, logical steps. Each step has to be finished with its own result and a moment for new decisions or adjustments on the original plan. A good phasing tries to restrict the total period which is needed to complete the project. For example, real estate developers could withdraw themselves from the process when there is no clarity about the total amount of time that is needed. It is hard to predict the long-term fluctuations of interest or requirements regarding the yield (Nelissen, 1999, p. 129).

3 Westergasfactory, Amsterdam

3.1 Short introduction into the project

The starting point of this chapter is to sketch in broad outlines the content of the re-allocation project 'Westergasfabric' in Amsterdam, to create an atmosphere for the next paragraphs.
In 1883 the Westergasfabric, was opened. The area covers about 15 hectare and the buildings, made of red bricks, are designed by architect Isaac Gosschalk in an eclectic style which is also known as "Dutch Renaissance". The ensemble of the buildings is very strong and reflects the industrial process: buildings are placed perpendicular and parallel to each other. The appearance of the different buildings varies a lot, which reflects liveliness (Piët, 1998, p. 14). Due to this variety in shapes of buildings, a lot of different new functions seem to fit in a new situation. The biggest building on the complex is the so called 'gasholder' (1902) with a volume of 100.000 m^3. However, in 1967 the production of gas made of pit coal, stopped (due to the discovery of natural gas (Pollmann, 1994, p. 45)). The area of the Westergasfabric has been in use by the municipal electricity company until 1993. During those years, a part of the buildings has been demolished. From that moment, it became clear that the remaining 16 buildings had a special historical identity and the decision was taken to preserve them. In the beginning of this swing of function, some of the buildings were occupied by visual artists, television- and moviemakers and other cultural groups like theatre companies, or festivals like Drum Rhythm. They gave preference to this location by themselves (Ibelings, 1998, p. 20). This was called the 'Temporarily Interpretation' (Tijdelijke Invulling) and should be only for a short period. In the meantime, there should be studied after the possibilities on long-term: the establishment of a park with cultural activities on the scale of the neighbourhood. These plans turned out completely different: the functions of the 'Temporarily Interpretation' proved to be the best solution for this area (Piët, 1998, p. 15). So from 1998, the area and its buildings were converted definitely into a cultural area which can attract people from the whole region, instead of just the neighbourhood.

3.2 Opinions

The next six paragraphs will describe the different opinions of experts among the re-allocation of the Westergasfabric, divided into the criteria of the 6F-model. Afterwards there is a paragraph with conclusions about these criteria.

3.2.1 Criterion 1: Fool

This is the most important factor which achieved the preservation and re-allocation of the area, with thanks to The National Trust (Monumentenzorg) and the district council of Westerpark (Boer, 1995, p. 26).

3.2.2 Criterion 2: Functionality

The functionality of the gasholder is good (Boer, 1995, p. 26), because it does not have any inner columns, beams of shores. The whole construction is incorporated into the roof and surrounding wall, so there is a span of 53 meter (www.westergasfabriek.nl). This ensures a flexible use of this building.
In general, because all buildings have a big variety in shape and volume, the whole complex is able to accommodate a lot of different functions (Piët, 1998, p. 14), which can change during the time. This is confirmed by the renters: some of them are settled and will stay for a long time. They take care of the continuity of activities and facilities in the area. On the other hand, there are also temporarily renters, who take care of diversity and the effect of surprise (Koekebakker, 2003, p. 42).

3.2.3 Criterion 3: Philosophy

The original philosophy behind the project has failed. In the beginning, the district council of Westerpark intended to arrange facilities for the inhabitants of the direct neighbourhood. However, due to the lack of money at the district council, this philosophy was not achievable (Boer, 1995, p. 26). Although these intended recreational facilities for the neighbourhood have not made it, the second philosophy of a broader social-cultural function (Pollmann, 1994, p. 46), worked out very well.

3.2.4 Criterion 4: Finance
To elaborate on the previous paragraph, at first sight the financing went wrong. After the change of philosophy, more finance companies could be attracted. For example the Ministry of Education, Cultural Affairs and Science (OCW) and the municipality, because of the national and metropolitan character of the functions (Boer, 1995, p. 26). Also real estate developer MAB showed to be interested to invest, after it became clear that they would a major subsidy of the National Trust (Monumentenzorg) (Koekebakker, 2003, p. 56). So, during the time, also this criterion became a success.

3.2.5 Criterion 5: Flow
There are not many experts who make an explicit statement about the flow in this project, but implicit phrases are ambiguous: due to the many participants in this project and the many years it took, the process was a difficult one. There has been a lot of conflicting opinions, partly due to the many uncertainties during the years. Over all, the open process of cooperation worked out well (Koekebakker, 2003, p. 128-143).

3.2.6 Criterion 6: Phasing
The phasing of this project can be judged as a factor of failure, because of the time which was taken for preparing. Especially the problems regarding the soil sanitation took a while. The production of gas out of pit coal caused namely a serious pollution of the ground. There have been a lot of uncertainties about the demands for this sanitation, before it was clear what the exact demands should be regarding the sanitation (Boer, 1995, p. 26). Thanks to the ‘Temporarily Interpretation’, this was not a big problem for the users of the area, but mostly for the investors.

3.3 Conclusions
The fool and functionality are being judged as the foundation for the success of the re-allocation of the Westergasfabric. Although the philosophy completely changed, during the process, it worked out well. The weaker factors did not have that much influence on the re-allocation to harm the whole project.

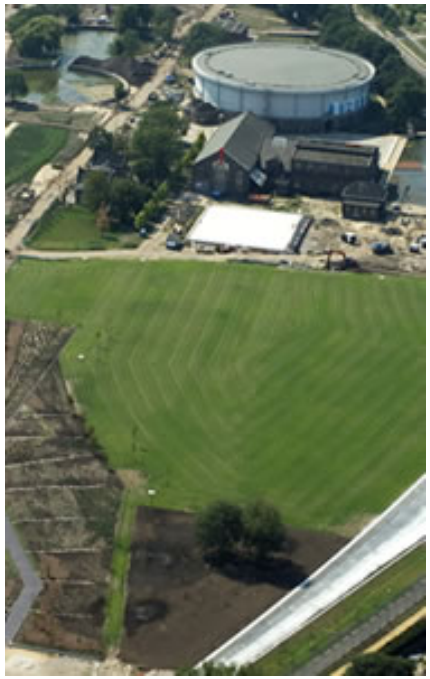
fig. 1 Aerial view of the Gasholder
www.mojo.nl


fig. 2 Purification building
www.amsterdam.nl

4 DWL, Rotterdam

4.1 Short introduction into the project

In the eastern part of Rotterdam has been accommodated waterworks 'factory' DWL from 1874 until 1973. The factory became technically dated and they decided to build a modernized complex on another location, the Beerenplaat (Beerens, 1991, p. 31). The original buildings of DWL (except the filter buildings) became a State Monument in 1981. Before that point was reached, a lot was happened in the area. From the moment the buildings became vacant, there arose plans for the area. The first idea was to build an amusement park called 'Lagorama'. The design for this park only kept one original building, the water tower. The other buildings, as well as the spatial structure of the area, would disappear. Fortunately, this idea was rejected by the city council, because they had the opinion that the real city centre deserved to become more attractive and animated. In the meantime, the Department of Public Works worked on a plan to build a residential area on the DWL-terrain. This plan also brushed away all buildings except the water tower. On that moment, alderman Mentink argued for the re-use of the existing urban ensemble, including the buildings and basins. About this time, in 1977, the association 'Utopia' (architects and designers) asked the municipality permission to use the water tower, as long as there was no final decision made. They wanted to establish a community for working and living, and they succeeded. Actually, this temporary compromise would save the DWL area and its buildings (Beerens, 1991, p. 37). When the water tower proved to be successful after re-allocation, then why not try the same for the other buildings (Pollmann, 1994, p. 75)? Finally, the municipality decided to build a residential area at DWL, but all original buildings should be preserved. Actually, there were two reasons: is would have been too expensive to demolish everything and build all new. Furthermore, the structure and buildings of DWL determined the quality of the area for an important part (Beerens, 1991, p. 42). This old structure is easy to recognize in the new situation, once there are built 2500 dwellings: its rational spatial organization and the cleat pattern of directions form the backbone of the new urban design (Beerens, 1991, p.23). Furthermore, each old building is re-allocated into for example an apartment building or a community centre.

4.2 Opinions

After the next six paragraphs, which describe the different opinions of experts among the re-allocation of the DWL ensemble (divided into the criteria of the 6F-model), the conclusions of this judgements are presented.

4.2.1 Criterion 1: Fool

The initiator of this transformation was Utopia, the association of architects and designers who were the first new users of the area (water tower). For sure, they set a good example for further developments (Pollmann, 1994, p. 75). Actually, they assisted the municipality by the design of the rest of the area.

4.2.2 Criterion 2: Functionality

This is a real factor of success. The water tower and the filter buildings had a clear structure, which turned out to be very easy to divide into new parts, like apartments (Boer, 1995, p. 36). Furthermore, "the urban structure (the dike, the water reservoirs) was a strong and clear one, so this could be easily used in the new groundplan", states drs. Altenburg (dS+V Rotterdam) in an official document of the municipality (Pollmann, 1994, p. 77).
There became a whole new ensemble of old and new buildings. This unity functions very well, except for the lack of cosiness. Also the connection between the DWL area and the rest of Rotterdam has some difficulties. In spite of this, the DWL area is a good example of the re-allocation of buildings which are important because of their cultural-historical and industrial background, combined with new buildings. (Pollmann, 1994, p. 78).

4.2.3 Criterion 3: Philosophy

Initially, there was no philosophy behind the project. The perception of a surplus value arose later (Boer, 1995, p. 36). Therefore, this factor has not much influence.

4.2.4 Criterion 4: Finance
"Finance has never been a problem" (Boer, 1995, p. 36). This is the only opinion of an expert about finance in the used literature. Because of the lack of underpinning of this statement, it does not qualify the project very clear.

4.2.5 Criterion 5: Flow
The flow was not a real issue during the development (Boer, 1995, p. 36). Since the municipality fully agreed with the plans to develop a living area by preserving the original characteristics of the area, the flow went on without any problems. Everybody seemed happy with this solution: the municipality, Utopia and housing corporation 'Volkswoningen' (Beerens, 1991, p. 6).

4.2.6 Criterion 6: Phasing
The phasing is a small minus point, but no factor of failure with a big influence. Because Utopia set oneself up as a developer of the view on the area (and partly the design), this had some consequences for the amount of time which that took (Boer, 1995, p. 36).

4.3 Conclusions
The functionality, together with the fool were the main factors of success at DWL. The lack of a philosophy in the beginning and the small difficulties regarding the phasing could not take down the whole project. "In an aesthetical way, DWL is a good example of urban renewal and the preservation of cultural-historical buildings at the same time, combined with new buildings" (Pollmann, 1994, p. 78).


fig. 3 Water tower
www.010.nl


fig. 4 Original DWL area
www.zwavel.com

5 Céramique, Maastricht

5.1 Short introduction into the project

In Maastricht, there is re-allocation area ‘Sphinx Céramique’ on the eastern bank of the Maas. This area has been an earthenware factory until 1987 (Cüsters, 1999, p. 11). The whole area occupies about 23 hectares. Although, only one (!) original building is preserved: the Wiebengahall, which has been in use for the production of sanitary goods like sinks or toilets (Vercauteren, 1996, p. 7). This hall has been transformed into a part of the Bonnefanten museum. The aesthetic value of the building originates from the repeating frame of concrete, with an arched roof on top. In this roof, there are also translucent arches. Even this building has not been preserved completely: only 60% is left (Boer, 1995, p. 35). The Wiebengahall is a good example of the early design of the ‘Nieuwe Bouwen’, an architectural movement with the credo: buildings have to be useful and clean (Vercauteren, 1996, p. 91). Nowadays, the rest of the area accommodates housing, offices, catering and culture.

5.2 Opinions

Due to the widespread demolition of the buildings of Céramique, the re-allocation project is quite limited and the opinions of the experts are very brief. But, in spite of their small number, some of them make sense.

5.2.1 Criterion 1: Fool

The Province of Limburg counts as the most important factor of success, having the role of the fool (Boer, 1995, p. 35).

5.2.2 Criterion 2: Functionality

The functionality is a big factor of failure. The Wiebengahall turned out to be unsuitable to accommodate a museum in it (Boer, 1995, p. 35). The technical (floors were too low) and physical conditions of the building were inferior to accommodate the valuable pieces of a museum. For this reason, the Wiebengahall is only an annex to the Bonnefantenmuseum (Vercauteren, 1996, p. 89 & 114).

5.2.3 Criterion 3: Philosophy

The philosophy of the project is good, namely the ambition to preserve this industrial heritage, from a historical point of view (Boer, 1995, p. 35). A weak point is the small number of buildings which are preserved: only one (Vercauteren, 1996, p. 7).

5.2.4 Criterion 4: Finance

To revert to the previous paragraph, the finance can be seen as a big factor of failure. There was not enough money to transform more original buildings of Céramique. That is the reason of demolition. They needed a lot of money to buy out the fabric, and there should be accommodated high-quality facilities in the area to make the project cost-effective (Boer, 1995, p. 35).

5.2.5 Criterion 5: Flow

“The flow was a factor of success” (Boer, 1995, p. 35). This is the only explicit opinion among the experts in the used literature. Because of the lack of underpinning of this statement, it has not much value to qualify the project.

5.2.6 Criterion 6: Phasing

There is a delay of approximately three years in the development of the whole Céramique area, due to problems regarding soil pollution. These problems took place in the early nineties. Furthermore, the municipality Maastricht had troubles to agree about the zoning plan (Cüsters, 1999, p. 55).

5.3 Conclusions

As already stated in paragraph 2.2.4, finance worked out indeed to be a big factor of failure. The project went on, but only one historical building could be preserved, due to the lack of money.
Furthermore, the functionality was not very good. So, the ónly building that could be preserved does not accommodate the optimal function for it. This seems to be a compromise.
The preservation of monumental buildings in the Céramique area is not judged as the best one by the experts. Though, it is important to mention: “the area as a unity functions very well, the housing is popular

and cost-effective, thanks to the position of the location in Maastricht" (Cüsters, 1999, p. 57). Unfortunately, this success is not really a result of the re-allocation of monumental buildings.

fig. 5 The Wiebengahall, built in 1912
www.nai.nl


fig. 6 The Céramique area demolished, except the Wiebengahall, 1989
www.mestreech.eu


fig. 7 The Céramique area after the re-design, 2003
www.maastricht.nl

6 Conclusions

The fool is judged indeed as an important factor in all three projects. The one-liner in paragraph 2.2.1 seems to become true.

The experts also confirmed functionality to be a major criterion. Variety is the keyword: when the buildings in an ensemble differ in volume, shape and material, it seems to be easier to re-allocate them with mixed functions.

The philosophy appeared to be important, but it is not the main criterion. Also a change of the philosophy is allowed, as long as there is enough social basis to support it.

Finance was not a problem in the three mentioned projects, in the opinion of the experts. However, problems with finance lead sometimes to a delay (phasing) or flow-problems.

Therefore, flow and phasing can be a minus point in a re-allocation project (regarding time), but emerge not to be a critical factor on which the project will fail completely.
For example, the phasing at the Westergasfabric was not very well arranged due to the problems with soil pollution. But in the end, the whole area flourishes!

7 Recommendations and Discouragements

Finally, some recommendations and discouragements to improve the chance for success of a project.

A general one is: A decision to demolish and construct new buildings seems to be the easiest way, but try not to see an existing monumental or cultural-historical building as a limitation of your wishes for a location, but as enrichment.

Furthermore: be sure that there is a fool who wants to give oneself to a project. This project has to possess enough functional qualities to be attractive for many possible new users. There has to be chosen a strong idea which can be carried out as ‘the philosophy’ behind the project. Once this philosophy is embraced by all participants, other factors like finance, flow and phasing will follow. There can arise problems regarding these factors, but they can not be invincible.

Try not to think too much in one direction only: preservation ór renewal. As this paper demonstrates, ‘Preservation by Development’ (www.belvedere.nu) is a better solution than to choose one out of two extremes. Make a fair consideration between the technical need to replace broken-down materials on the one hand, and the conservation of essential historical values on the other hand (Denslagen, 1988, p. 18). New estate has to strengthen historical buildings, and not replace them (Ibelings, 1998, p. 7).

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Pictures

Title page:	Gasholder, Westergasfabric www.mecanoo.com Water tower, DWL www.top010.nl Wiebengahall, Céramique www.nai.nl

fig. 1 Aerial view of the Gasholder
www.mojo.nl

fig. 2 Purification building
www.amsterdam.nl

fig. 3 Water tower
www.010.nl

fig. 4 Original DWL area
www.zwavel.com

fig. 5 The Wiebengahall, built in 1912
www.nai.nl

fig. 6 The Céramique area demolished, except the Wiebengahall, 1989
www.mestreech.eu

fig. 7 The Céramique area after the re-design, 2003
www.maastricht.nl

PART III - Research & Design

Contents

1 Relation of the clover-leaf and the city of Rotterdam (high scale)

1.1 Introduction

The research- and design location, the clover leaf of Blijdorp, is accommodated in the north-west part of Rotterdam. The problem field, as described in the thesis plan, contains problems on a higher and a lower scale level. On both levels, the lack of connectivity plays a big role. Because of that, the analysis focuses on both scale levels, starting at the higher level.

1.2 Highway-exits

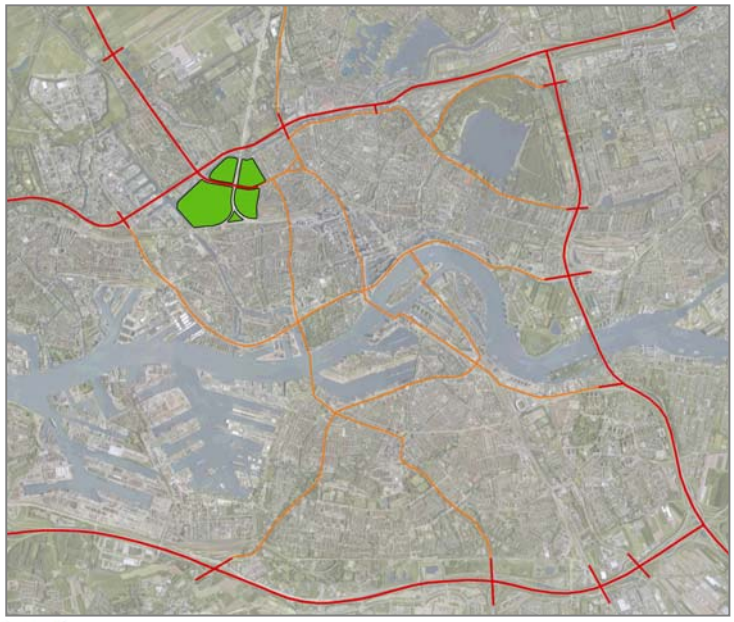


Fig. 1 | The clover-leaf of Blijdorp in relation to the highways and city roads of Rotterdam

The map shows the very close position of the location to highway A20. Even more serious is highway A13, which finds its way deep into the built up area of Rotterdam. Of all highway exits, this is the one which penetrates the deepest into the city. Due to the shape of a highway (a broad profile and cars which drive with a high speed on it), this road is one of the causers of the lack of connection in the clover-leaf.

1.3 Train: route, stations, reach

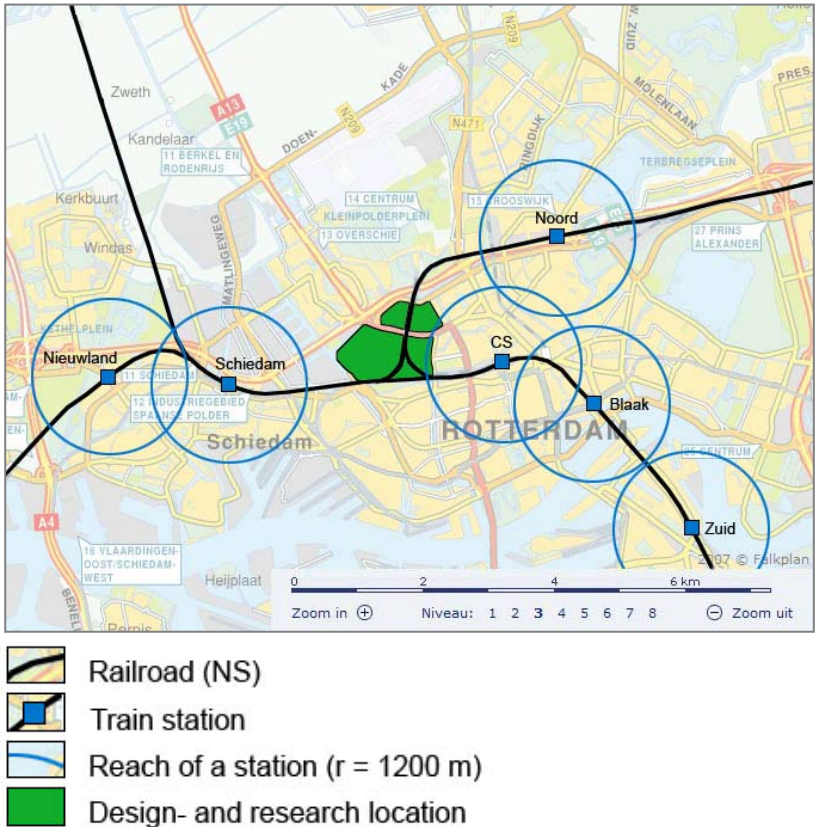


Fig. 2 | Train stations of Rotterdam with their reach in the surrounding areas

This map analyses the position of the clover to the Public Transport network, especially the railroad and its train stations. According to

‘Atelier Zuidvleugel/Stedenbaan’, who does research after possible, preferable and likely solutions for the spatial development of areas around train stations in the south-west of the Netherlands (www.atelierzuidvleugel.nl), the reach of a station is 1200 meter. This amount is determined by the fact that this distance can be travelled by bike in 5 minutes, and by foot in 15 minutes.
This means that the clover-leaf is practically not covered by any of the stations. The eastern part of the clover (the entrance of Blijdorp Zoo) hits only the edge of the reach of Central Station.

1.4 Randstadrail: route, stations, reach

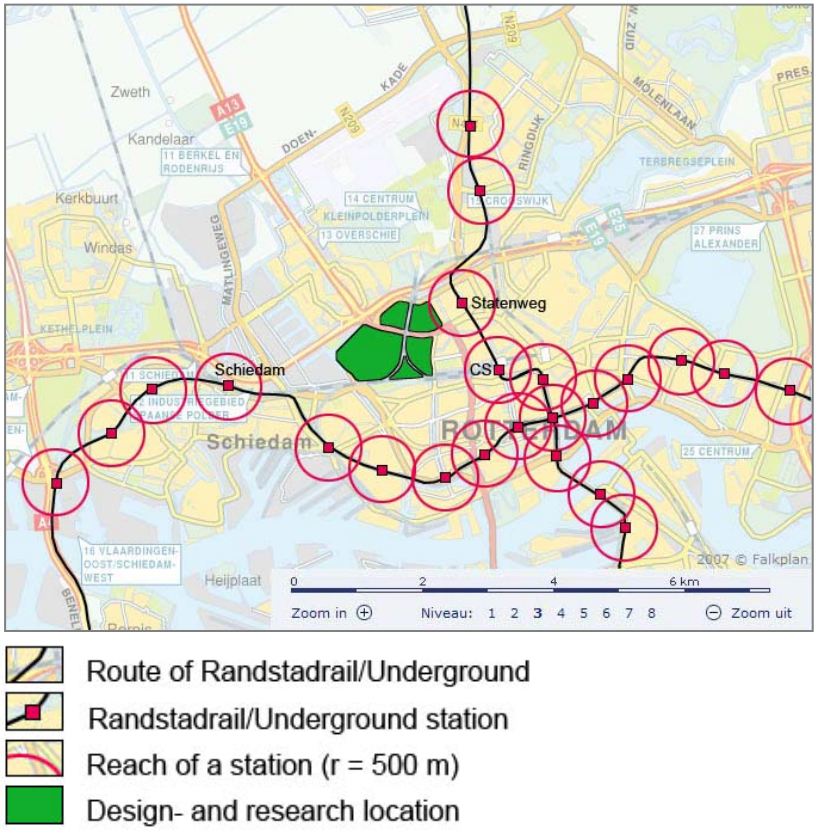


Fig. 3 | Stations of the underground/Randstadrail with their reach in the surrounding areas

An other type of Public Transport in Rotterdam is the Underground, which makes a transition into Randstadrail from Central Station to the north. This kind of stations has a reach of about 500 meter (Bach, 2000). The reach of the future station at the Statenweg (from 2009), hits the north-east part of the clover-leaf slightly, but the remaining quadrants all are far away from any station.

1.5 Conclusions

Considering the nowadays situation regarding Public Transport, the clover-leaf barely profits from this kind of facilities. The location is not a housing area, which makes this less worse. For example, the Vroesenpark is a park for the neighbourhood, though it is not necessary to be reachable by train or Randstadrail. On the other hand, this rather mediocre accessibility by train or Randstadrail does not encourage any future developments in other spheres or functions than there are now. It also may explain the reason why 80% of the zoo-visitors travel by car: it is not very easy to reach this area by Public Transport.

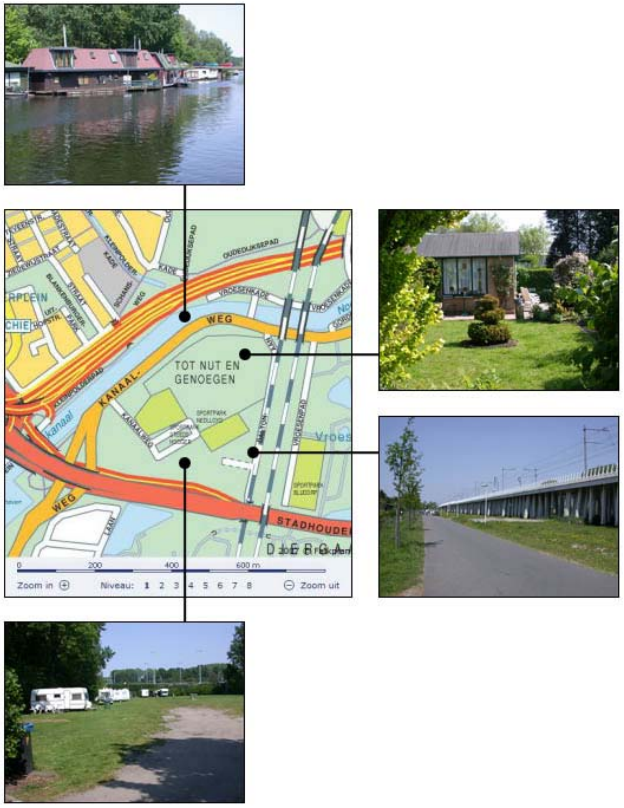
2. The character of the different quadrants of the clover-leaf (low scale)

2.1 Introduction

The first chapter dealt with the clover leaf in relation to the whole city of Rotterdam; the higher scale level. To get more acquainted with the lower scale level, this chapter gives more details about the sphere, functions and landscapes in each quadrant (A, B, C, D) of the clover-leaf. The railroad triangle is known as part E (Thesis plan). Nevertheless, this is such a small area, with no further important details to mention on this moment. So, this chapter will not explain this triangle ‘E’ more detailed.

2.2 Quadrant A

The northern part of this quadrant accommodates an allotment garden, ‘Tot Nut en Genoegen’. There is also a tennis court, ‘Unilever’ (since 1939). In 2000 the club had to move a little from the railroad for the construction of the HSL on the old surface of the tennis court. The west part of the quadrant accommodates an ‘urban camping’, a football club and a horse riding school. Along the Kanaalweg, there is canal ‘The Schie’. Over here, it is crowded with houseboats.



2.3 Quadrant B

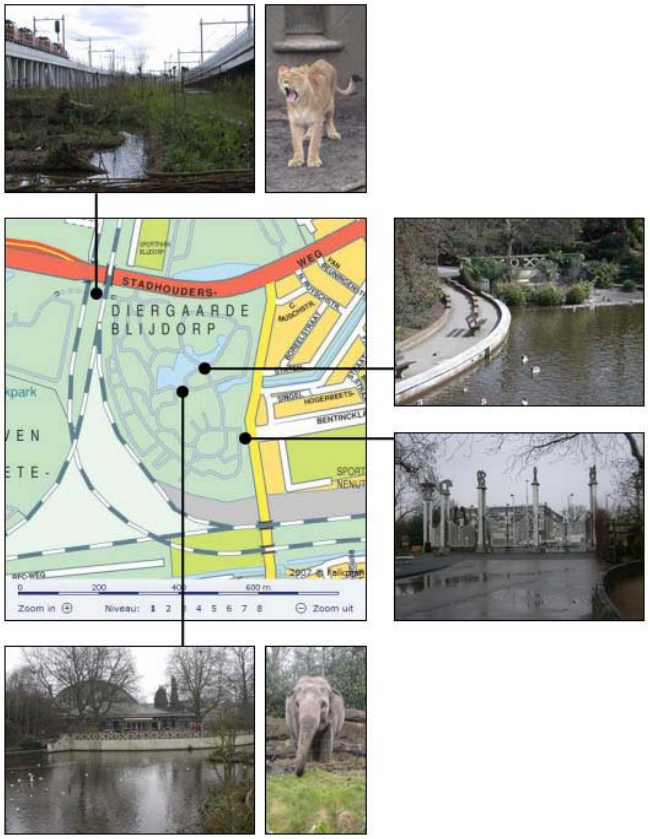
Quadrant B is dominated by the Vroesenpark. It was established in 1929; W.G. Witteveen made the design for it. From 1948 until 1958 the park has been redesigned into a park which could actually be used, in stead of just a park which shows its beauty. From that moment the tennis court was there too.

2.4 Quadrant C

Quadrant C is the biggest one of all. Here is also an allotment garden: ‘Streven naar Verbetering’. The northern part of this area is owned by Blijdorp Zoo; they enlarged their surface in the year 2000.
Furthermore, there is an area with sports facilities: a baseball stadium, football fields and a fitness club.
In the south, there is the ‘Roel Langerak-park’, with an adventure playground for children: the ‘Speeldernis.’ Discgolf can be played in the park on a special route.

2.5 Quadrant D

The original surface of Blijdorp Zoo is on quadrant D. This part accommodates a lot of monumental buildings. The design of the ‘garden’ itself (the ground plan) has also a monumental standing.
Due to the enlargement of the zoo in 2000, there is a dichotomy between the old and new part of the zoo. This is caused by the railroad for public transport and the new railroad for goods, the HSL.
Blijdorp Zoo tried to disguise this junction, by building a swamp between both railroads. There is some plantation, which is used by the zoo itself to feed different animals.

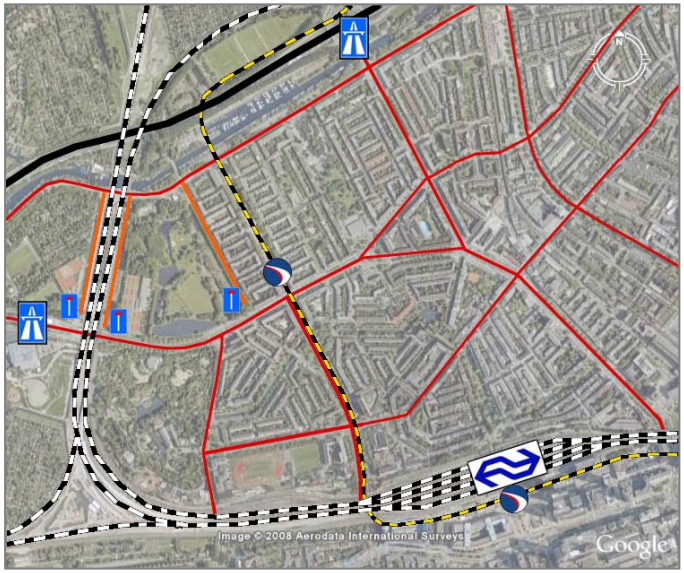


3 Relation of the clover-leaf and the residential area of Blijdorp (low scale)

3.1 Introduction

After an introduction into the spheres of the quadrants, let us get back to the clover-leaf and its surroundings. Chapter 1 yet described the relation to the whole city of Rotterdam; chapter 3 zooms in to a lower scale level and handles with the clover-leaf and its direct neighbouring urban area: Blijdorp.

3.2 Infrastructure

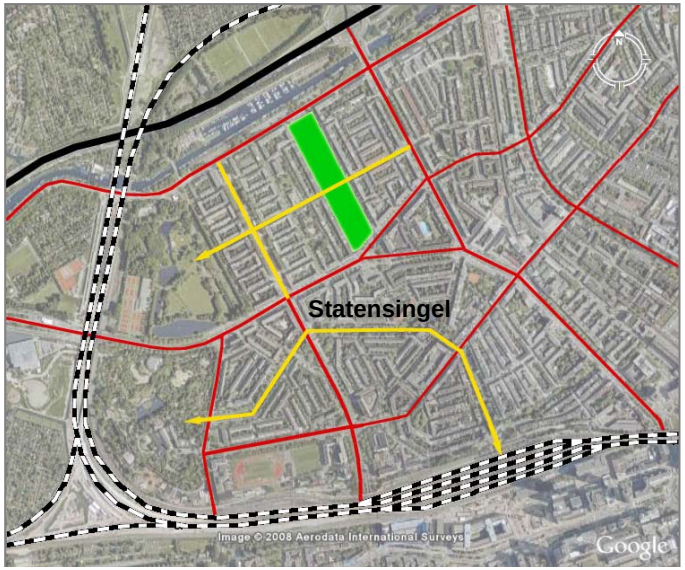


Highway
Main city roads
Dead end road
Railroad
Randstadrail
Central Station Rotterdam
Randstadrail station
Highway exit
Dead end road sign

Fig. 4 | The infrastructure in and between the clover-leaf and the neighbouring housing district of Blijdorp

All main city roads go along the clover-leafs and separate the quadrants from each other. None of the main roads enter the quadrants. There are few roads which do enter for example quadrant A and B, but these are all dead end roads. So, only purposeful visitors will use these, and there will be less coincidental visits or passages.

3.3 Urban structures



Highway
Main city roads
Railroad
Long lines, representing important urban structures or viewing lines
Noorderhavekade: another park, perpendicular to the Vroesenpark, connected with a 'long line'.

Fig. 5 | Long lines, like viewing lines or important urban structures, cut through the residential area

Besides roads, who can connect areas or divide them on the other hand, also other 'long lines' contribute to the ensemble of a housing district. An example is the viewing line (and walking route) in the north,

which goes through the whole neighbourhood and ends in the Vroesenpark. Furthermore, the Statensingel gives the area an architectural identity, because of its historical, but still strong, pattern and looks. This line originates from Central Station and ‘ends’ at the border of Blijdorp Zoo.

Fig. 6 | Statensingel

3.4 Conclusions

Main roads often go along the quadrants or housing districts. Other urban structures, like canals with a walking avenue along, or viewing lines, cross through the neighbourhoods and give it character. Therefore, these are very valuable.

4 Landscapes in the clover-leaf (low scale)

4.1 Introduction

The preliminary analysis in the thesis plan already pointed out that the clover-leaf area accommodates as much as 2 allotment gardens. This may be a lot, or is it just enough? To be able to judge about this amount (quantity), it is worth to take a look at the allotment gardens in the remaining part of Rotterdam (4.2.1). Besides, to judge about the quality of both gardens, it is necessary to analyse them on a lower scale (4.2.2).

4.2 Allotment gardens in Rotterdam

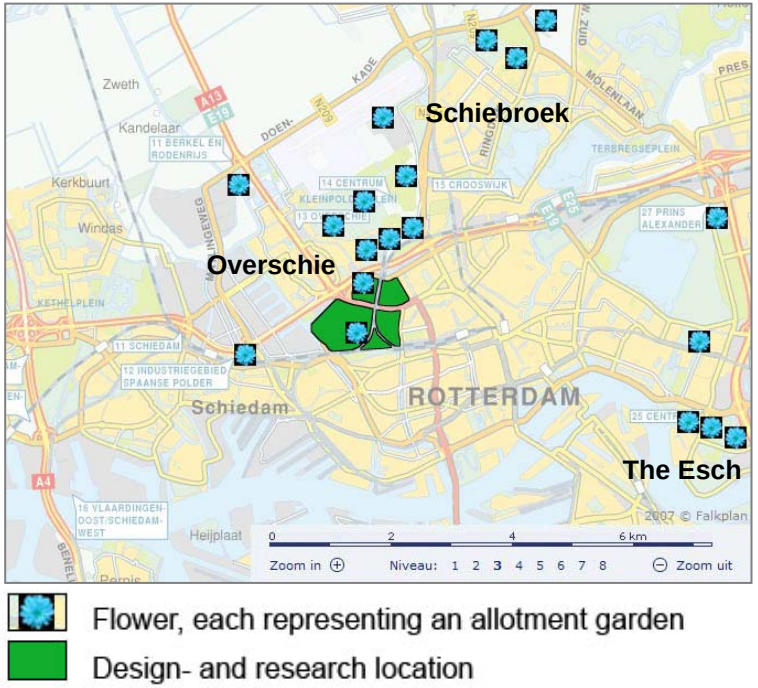


Fig. 7 | Allotment gardens at the north side of the Maas

The northern part of Rotterdam counts as much as 19 allotment gardens. There are 3 main concentrations of gardens: at the north of Schiebroek, between Overschie and Schiebroek and around the Esch, in the east of Rotterdam.
Both allotment gardens in the clover-leaf are the ones who penetrate the city of Rotterdam the most in the direction of the city centre.

4.2.1 Allotment garden in design area

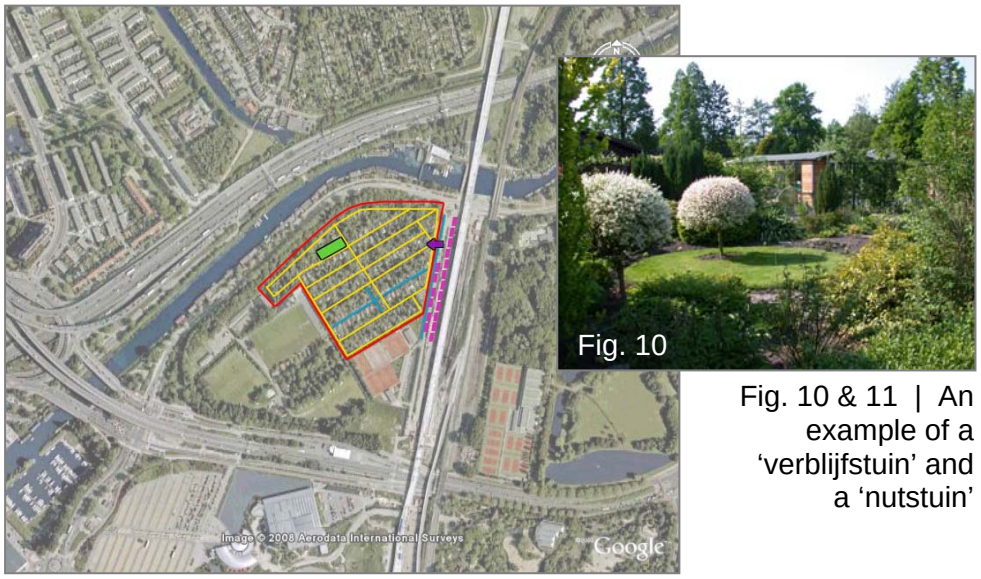


Fig. 10 & 11 | An example of a 'verblijfstuin' and a 'nutstuin'

Fig. 8 | Allotment garden 'van Nut tot Genoegen' in quadrant A

Border of the allotment garden
Footpath
Small ditches
Clubhouse
Parking area along the road (*not* organized)
Entrance

Fig. 9 | Allotment garden 'Streven naar Verbetering' in quadrant C

Allotment garden 'van Nut tot Genoegen' in quadrant A is not very big, but its design is relatively spacious, thanks to the large dimension of each garden. Mainly, its character is a garden where the owners stay for relaxing. Therefore, the gardens look well maintained and contain in most cases plantation for the sake of beauty ('verblijfstuin').
Car parking is a minus point at this garden. There is no parking place on the surface of the garden, so the visitors have to park along the narrow road near the entrance.

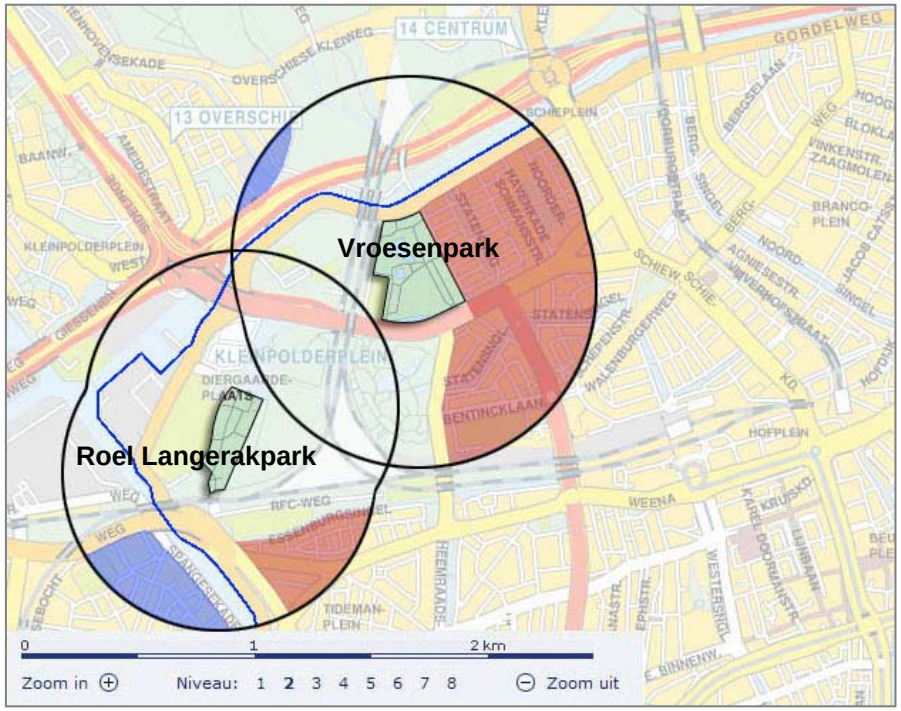
Allotment garden 'Streven naar Verbetering' in quadrant C occupies a larger surface than the previous one, but each personal territory is smaller. The footpaths are closer to each other. Therefore, this garden accommodates a lot more territories, which are much more used for the cultivation of vegetables ('nutstuin') and less for the sake of beauty. Parking area is better organized in this garden; they have parking places on their own terrain. This garden has 2 entrances, which is practical, but also offers the owners the chance to walk into the Roel Langerakpark directly, which is next to the allotment garden.

Fig. 12 | A ditch between gardens

4.2.2 Conclusions

Both gardens share the same elongated structure of footpaths, but although their function, character and sphere are completely different. Both gardens are very introvert (1 or 2 small entrances); this guarantees the piece and quiet.

4.3 Parks in the clover-leaf: reach



Reach of the park (r = 1200 m)

Physical border (the Schie): crossing is only possible at a few traffic nodes

Residential area which is in the direct reach of a park

Residential area which is in the reach of a park, but behind the psysical border.

Fig. 13 | The Vroesenpark and Roel Langerakpark are both located in the clover-leaf

The clover-leaf of Blijdorp contains 2 parks (fig. 13). When drawing a hypothetical reach of 1200 meter around each park, they have some overlap. However, in this overlap area, which should be crowded with people, who can make use of both parks does not live any inhabitant!

In any case, there do not many people live within the total reach of both parks: about 1/3 part of the reach of the Vroesenpark is residential area, and less than 1/8 of the reach of the Roel Langerakpark. These parks are designed to have a neighbourhood-function, but their location is not very good to attain this goal.
The physical border, canal the Schie, makes it even worse: this canal can be crossed only at a few points. Therefore, the realistic reach of the Langerakpark decreases further to only 1/10.

The next paragraphs give a closer look to each park; the emphasis is on the analysis of the infrastructure in and around the parks and on the (public, recreational) functions in the parks.

Fig. 14 | Playground in Vroesenpark

Fig. 15 | Bicycle route along Vroesenpark

4.3.1 Vroesenpark in quadrant B

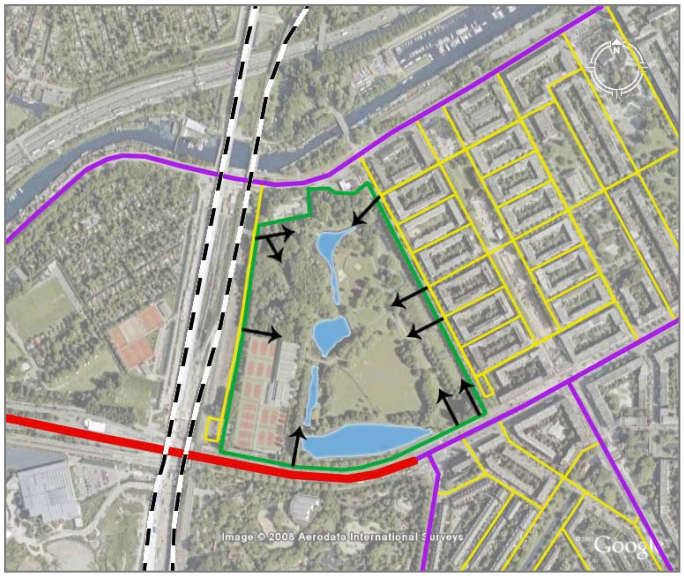


Fig. 16 | Infrastructure and entrances of the Vroesenpark

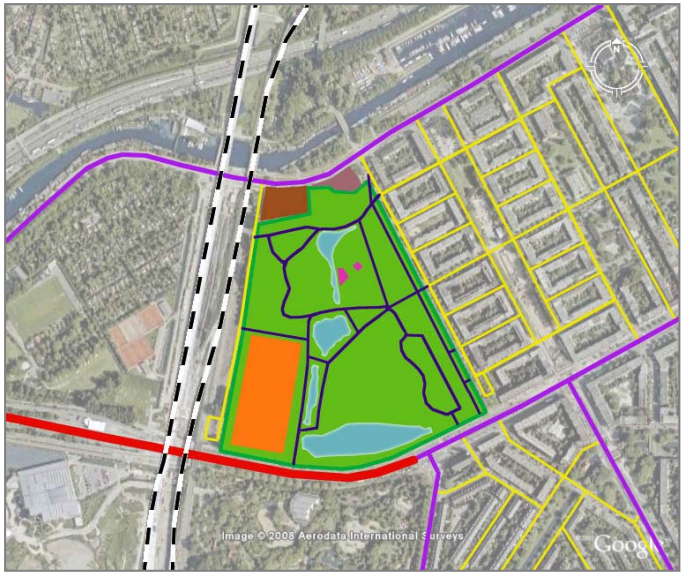


Fig. 17 | Facilities and walking routes in de Vroesenpark

Highway (A13, 80 km/h)
Main city road (50 km/h)
Neighbourhood street (30 km/h)
Railroad
Water
Border of the park
Entrance to the park

The main infrastructure goes around the park. Only some neighbourhood streets end at an entrance of the Vroesenpark (at the east side). Nevertheless, at the west side of the park there are some entrances which originate from a dead end road, which is not very functional.

The heavy plantation at the west side of the park, together with the tennis court, form a barrier to minimize the nuisance of the railroad, which runs alongside the park.

The walking tour is some sort of circular arranged around the water of the park. Visitors have a lot choice which path to take for making a walk, so it is easy to walk a different route each time. The playground for kids is located in the centre of the park. It is easy to reach from the residential area, so it is attractive to spend some time over there for kids.
The other facilities (besides the tennis court which was already mentioned on the previous page), like the gas station and the storage yard for municipal works, do not belong to the park and are therefore located in the northern corner, as far as possible from the urban area of Blijdorp. Over there, it bothers the park the least, because from the north will come almost no visitors (see fig. 17).

4.3.2 Conclusions

The water and playground form the centre of the park: walking routes go around, entrances are spread around on each side. The tennis court may be located in this quadrant, but has no connection to the park (not physical, but also not visual).

Highway (A13, 80 km/h)
Main city road (50 km/h)
Neighbourhood street (30 km/h)
Railroad
Water
Border of the park
Tennis courts
Storage yard of public works
Gas station
Playground
Footpath: walking route

4.3.3 Roel Langerakpark in quadrant C

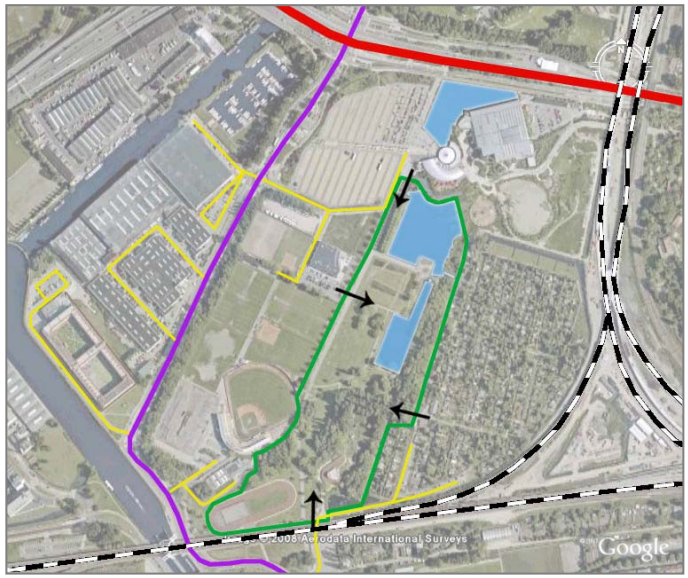


Fig. 18 | Infrastructure and entrances of the Roel Langerakpark

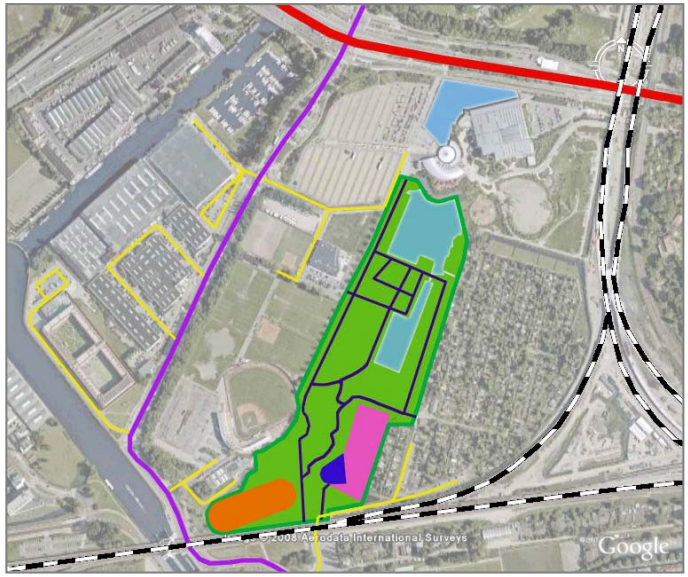


Fig. 19 | Facilities and walking routes in de Roel Langerakpark

- Highway (A13, 80 km/h)
- Main city road (50 km/h)
- Neighbourhood street (30 km/h)
- Railroad
- Water
- Border of the park
- Entrance to the park

The main infrastructure goes around the park on a certain distance: there is no direct connection. A benefit is this is the silence in the park, when there are no cars passing by. The accessibility of the park becomes more difficult by this situation; only 2 neighbourhood roads reach the park (and one of them is actually the road to Blijdorp Zoo, so this is not made especially for the park). At the side of the residential area, on the south side of the railroad, there is only 1 entrance to the park.

Because of the elongated shape of the park and the relative great distance between the park and the residential area, only the southern part of the park is being used intense. The northern part is more quiet, but also rather rigid: one open space with some straight walking paths through it.
The walking routes are, just the same as the shape of the park, very elongated. It is possible to walk a route without passing the same point twice. Especially in the northern part of the park there is not much plantation, so the walking tour will not be very surprising. It seems this part of the park of more artistic than made for using it.
The southern part is livelier: there are located activities like an athletics track and a large adventure playground for kids. This area is easier to reach for people who live in the other side of the railroad.

4.3.4 Conclusions

The success of the Roel Langerakpark is doubtful, mainly because of the distance between possible users and the park itself. The facilities are located on the best spots, while the remaining park area just seems to fill the remaining area up to Blijdorp Zoo (the water is actually a physical border in stead of the centre of the park, like in the Vroesenpark).

- Highway (A13, 80 km/h)
- Main city road (50 km/h)
- Neighbourhood street (30 km/h)
- Railroad
- Water
- Border of the park
- Athletics track
- Day care centre for children
- Playground 'the Speeldernis'
- Footpath: walking route

5 Blijdorp Zoo (low scale)

5.1 Introduction

Blijdorp Zoo occupies a substantial part of the clover-leaf, so it is important to get clear all the problems, demands, needs and advantages in the zoo. This analysis mainly points at the problems and advantages of Blijdorp Zoo. In between the P2 and P3 has to be done research after the needs and demands of the zoo.

5.2 Division into continents

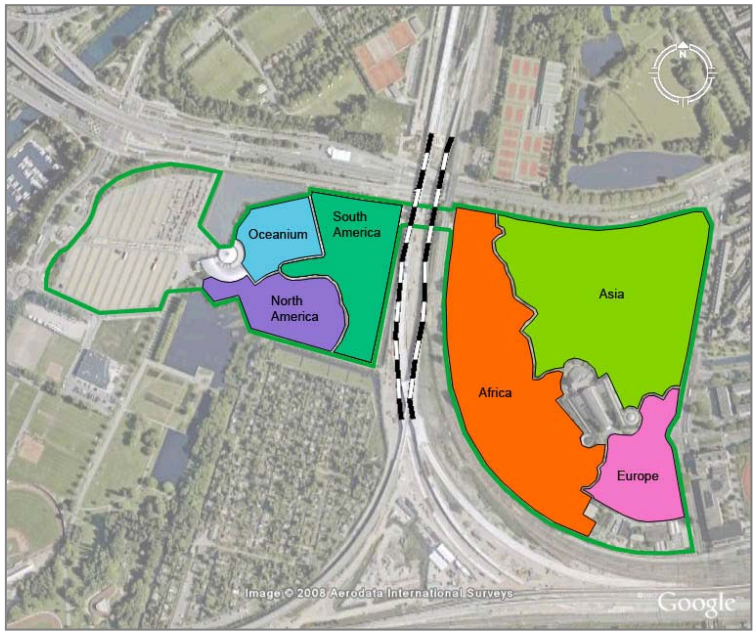


Fig. 20 | The division of Blijdorp Zoo into 5 continents and the Oceanium

Blijdorp zoo is divided into continents. This follows from the first Masterplan (1988), which argued for more space to live for the animals. Besides, their territory should look like their natural biotope. Because the original zoo area turned out to be too small to replace all old cages for new biotopes for all the animals, they enlarged the zoo so they should have enough room to accommodate all the continents.

5.3 Masterplan II: outstanding maintenance and finishing the new area

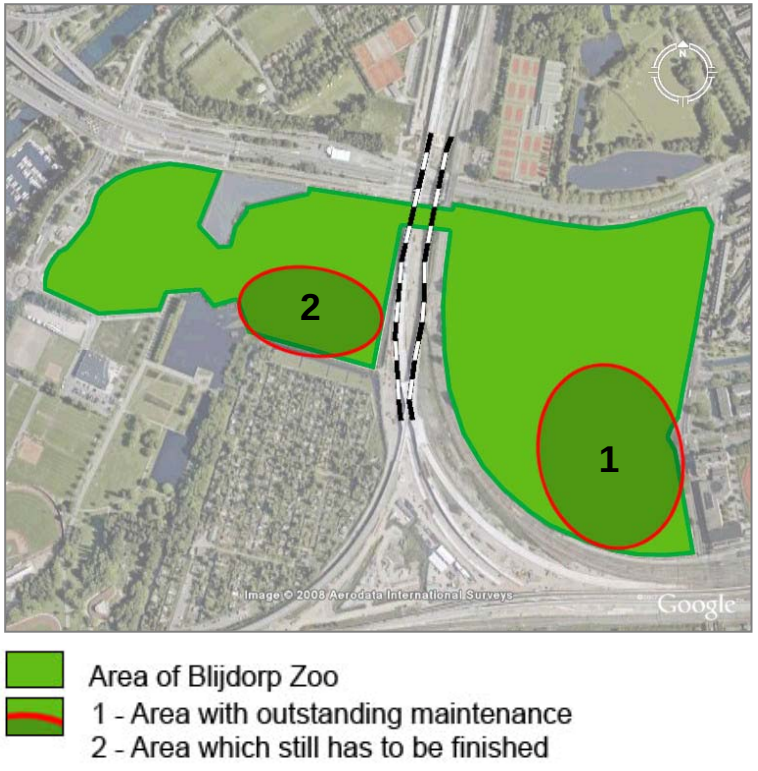


Fig. 21 | Areas in the zoo which need interference

The second Masterplan of 2005 argues for two main points. In the first place, the new area on the west side of the railroad has to be finished completely. This concerns the continent North America. Furthermore, in the old zoo area is still a lot of outstanding maintenance. When they started to modernize the zoo from 1988 (the first Masterplan), they started to built Asia. Now, they are busy with the finishing of Africa, and next one in line is Europe (fig. 21).

5.4 The spatial organization of the zoo: how does it function?

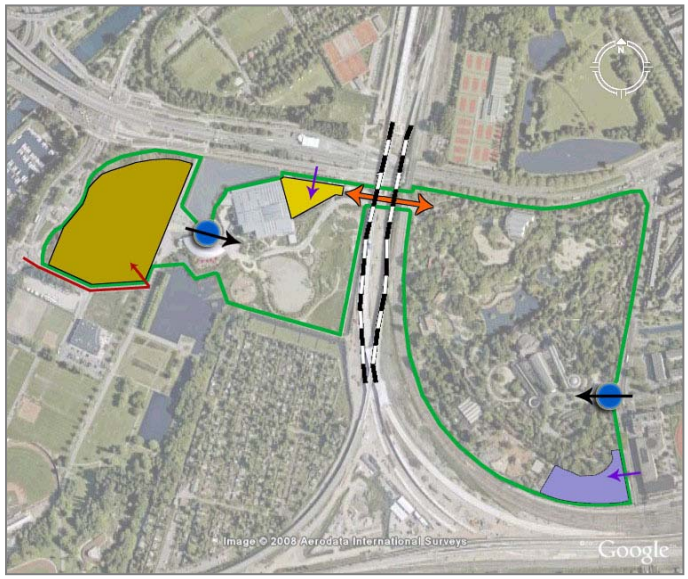


Fig. 22 | Movements in and on the borders of the zoo: parking & entrances

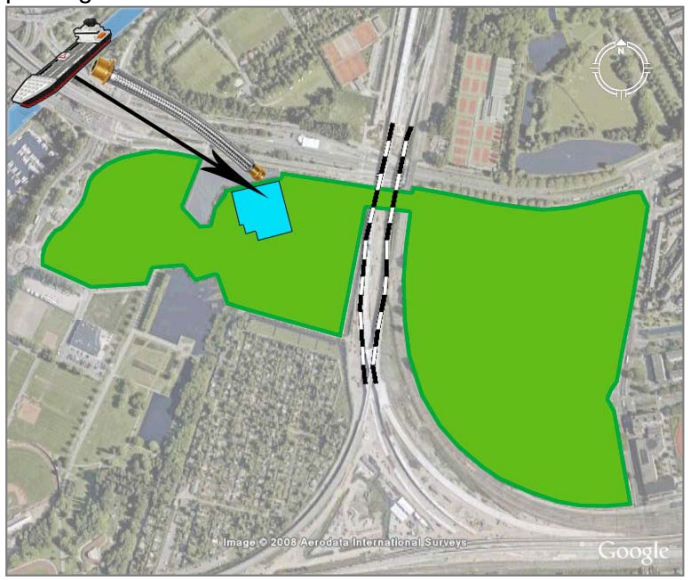


Fig. 23 | The Oceanium-boat supplies the zoo of fresh water from the Atlantic Ocean

Parking place for visitors
Parking place for employees
Offices and storage for zoo
Border of the zoo
Entrance for visitors
Entrance for employees
Tunnel: the only connection
Route from road to parking place

Together with the enlargement of the zoo in 2000, they built a large parking place for 1450 cars on the west side of the zoo. This makes the zoo easier to reach from the highway (and 80% of the visitors travels by car, so this is an important factor to keep in mind (2Hwww.ruimte-mobiliteit.nl)); before, people had to enter the busy district of Blijdorp to find a parking place somewhere in the residential area. This was not easy for visitors as well as for inhabitants, who had trouble themselves to find a parking place near their own house. Over all, these problems are not there anymore most of the time.
Instead of that, some new problems arose, like mentioned in the thesis plan. The most important one is the dichotomy of the zoo in two parts. These parts are connected by only one tunnel!

In 2000, the enlargement of the zoo occurred and they started to build a huge aquarium which is called the Oceanium. In this biotope live many different sea-animals. Because Blijdorp Zoo wants to keep up quality of this sea-aquarium, it is necessary to filter the water: thanks to a unique system of recycling, every 90 minutes the whole volume of water is being filtered.
In spite of this, the water quality decreases during the time. Therefore, every two weeks an 'Oceanium-boat' (a mini-tanker) arrives in the Schie with 300.000 litre of fresh water from the Atlantic Ocean stored in its tanks. This water is brought to Rotterdam by ships from P&O Nedlloyd, which use the clean water just for ballast, when they have removed their freight far away and have to sail back empty. Back in Rotterdam, the fresh water is being pumped into the smaller 'Oceanium-boat, which can enter the Schie. Once that boat is there, the water flows by an underground pipeline to the Oceanium.

Oceanium
Area of Blijdorp Zoo

Fig. 24 | The Oceanium-boat

5.5 Cultural historical heritage in the zoo

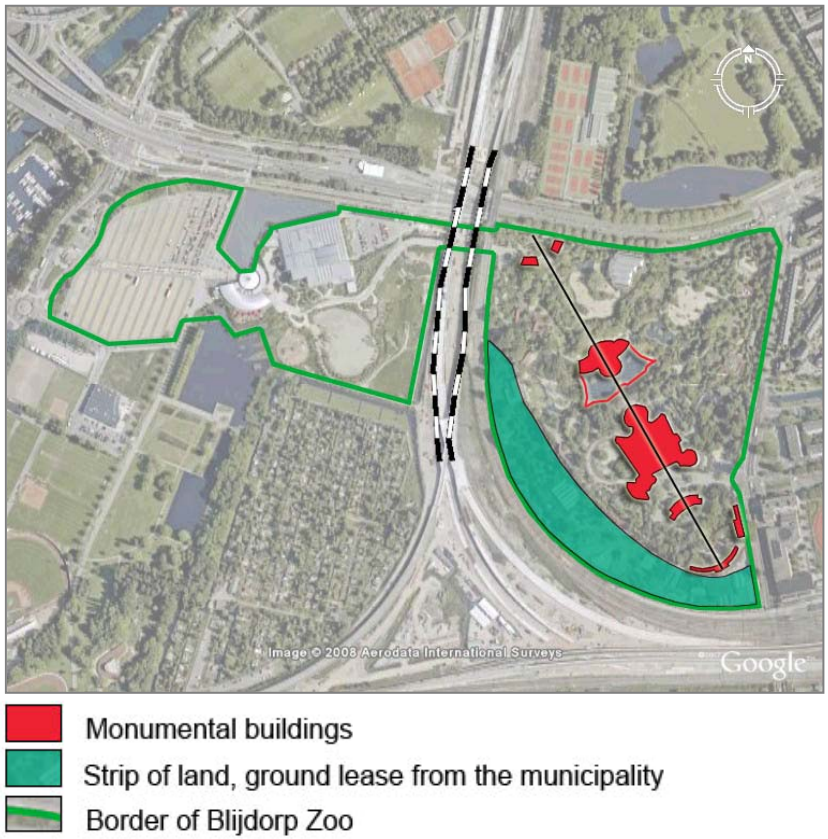


Fig. 25 | Map with the historical heritage in the zoo

The monumental buildings in the old part of the zoo are being connected by an imaginary axis through the area. When walking through the zoo, this axis is hardly noticeable, because the walking paths do not follow this axis. The opposite is true: the walking tour is full of elegant curves. This curved style is typical for the whole design of the zoo, as well for the buildings. Van Ravesteyn used this style in his entire design.

The strip of land on the west side of the zoo was never owned by the zoo itself: they rented it from the municipality. Because of that, this area never accommodated brick buildings; only wood was used. This could be removed easy, in case that would be necessary (Vries, 1986).

5.6 Conclusions

When redesigning the clover-leaf, it might turn out to be necessary to make some changes to Blijdorp Zoo. The most important point, meriting attention, are:
- the monumental buildings have to be preserved;
- the Oceanium has to stay on the location near to the Schie, to maintain the supply of water;
- the only tunnel which is there nowadays between both zoo-parts is not enough to establish a feeling of unity; there is a lack of visual and physical connection, this has to change!

6 Concept

In order to make the design concept clear, the clover-leaf and the surrounding districts are represented schematically in fig. 26. The blocks are not representing functions, but only the cohesion between certain parts of the city. One block represents a certain neighbourhood, which is most of the time separated from the next one by a main city road. These city roads are not in the scheme, because they do not cause dramatic barriers: they can be crossed rather easy by foot, bike or car. The infrastructure that is actually drawn in the scheme, has such a big profile that it bothers the connectivity between different parts of the city: railroads, canal de Schie and highways. These can only be crossed at a few points, and not always with all possible vehicles (for example: there are some bridges for pedestrians which cross the Schie, but cars can only cross the Schie using the highway itself).
In broad outlines, the nowadays situation of the clover-leaf can be described as a no man's land, which is surrounded by a lot of different urban districts with their own sphere. However, the clover is that much isolated which makes it impossible to profit from these neighbouring

areas. In addition, the individual quadrants of the clover do not have a lot of connection with each other!

Summarizing: 4 smaller units, separated from the rest of Rotterdam. From the top, they can be seen as a unity with each other, but those internal connections are also weak.

Fig. 26 | A scheme of the clover-leaf as a no man's land between other districts

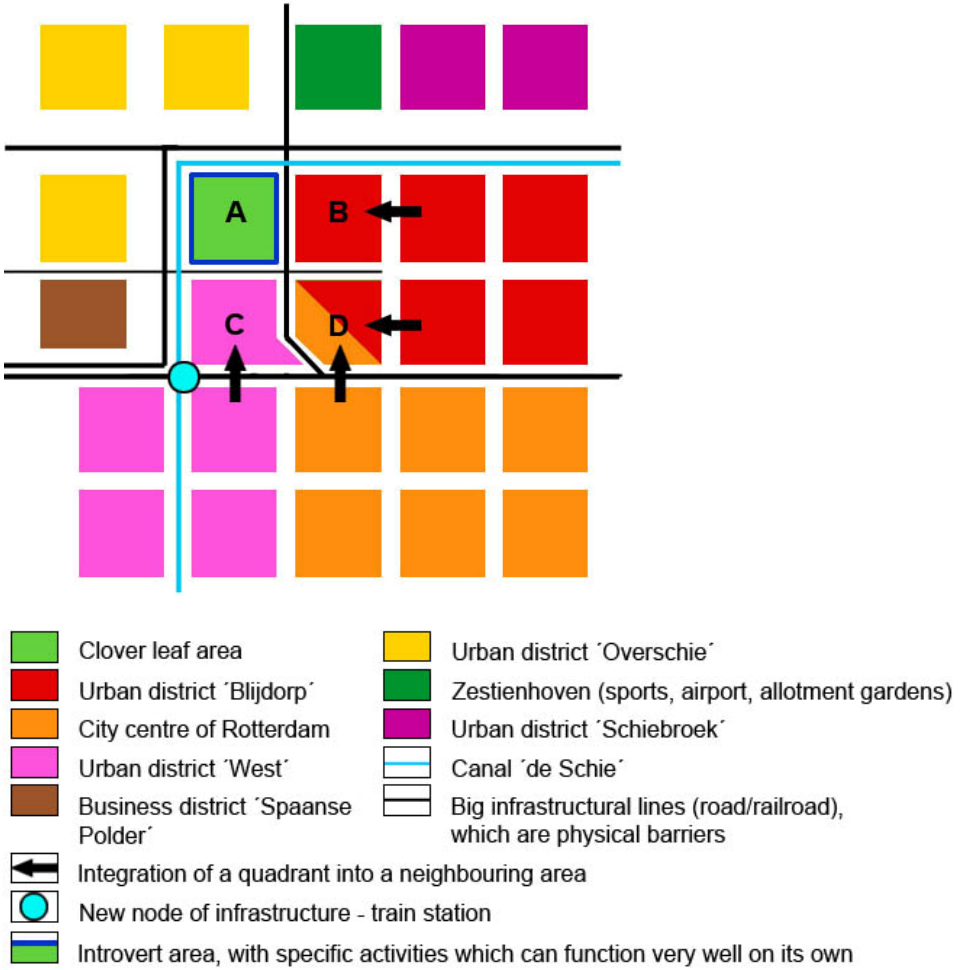


Fig. 27 | A scheme of the design concept for the clover-leaf, integrated in the city

Having the conclusions of the analysis in mind, there can be drawn up a list of starting points for the re-design, which are deciding factors for design choices:

- A facility like an allotment garden, does not necessarily need a lot connections to its surroundings: its enclosure is a strength to ensure

the piece and quiet in the gardens. Therefore, quadrant A can keep its introvert character (it could even be móre fortified than it is now. The blue line around quadrant A in fig. 27 represents this thought). Only, not all functions do fit perfectly well in this area: maybe the tennis club should be more attractive when it is situated on a location which is more evident and easier to access.

- Quadrant B and D have the best opportunities to be a more evident unity with the remaining surface of district Blijdorp, thanks to the smaller lines of infrastructure over there. This does not mean that the functions of the district Blijdorp will rule over quadrant B and D in future. Particularly, this means that urban structures will be shared, which constructs more cohesion. For example, the Statensingel could be extended into the area which is now the old zoo part and the Vroesenpark (fig. 28).

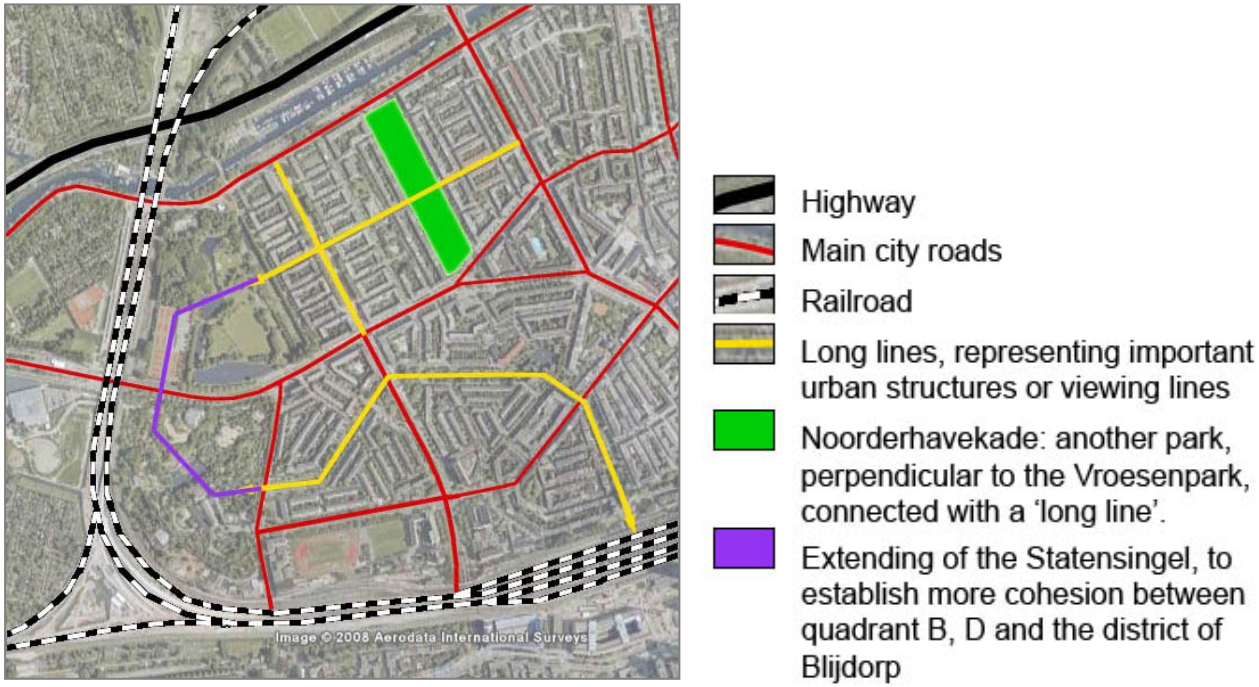


Fig. 28 | Conceptual design to strengthen the cohesion by extending urban structures

- The third important starting point of the design is the lack of reach of Public Transport stations (train and Randstadrail) in the clover-area. Therefore, it might be a solution to build a new train station along the existing railroad between Central Station and Schiedam (fig. 29).
In reality, Atelier Zuidvleugel is also doing research after the possibilities for the construction of a new station over there. However, they call it 'station Spangen' en it should be located a bit more into the direction of Schiedam. This extra train station offers visitors of Blijdorp Zoo an easier possibility to reach the zoo by Public Transport. Furthermore, the inhabitants of the urban district outside the clover (Rotterdam-West and Spangen) are able to travel by train easier. The new node of infrastructure also will offer the opportunity to enhance more cohesion between quadrant C and the neighbouring area on the south side of it.

Summarizing, nowadays the clover-leaf consists of 4 smaller areas which together form a no man's land.
In future, the clover-leaf will not become a unity itself, because of the importance of the infrastructural lines which cut the area into 4 quadrants. Instead, this unity-concept will be found in the cohesion between the individual quadrants with their direct neighbouring urban districts. Reverting to the thesis plan, this means that the external lack of connections will be improved. The analysis proved the internal lack of connections to be a smaller problem. Only for the dichotomy of both zoo-parts is this internal lack of connection quite a point of attention.

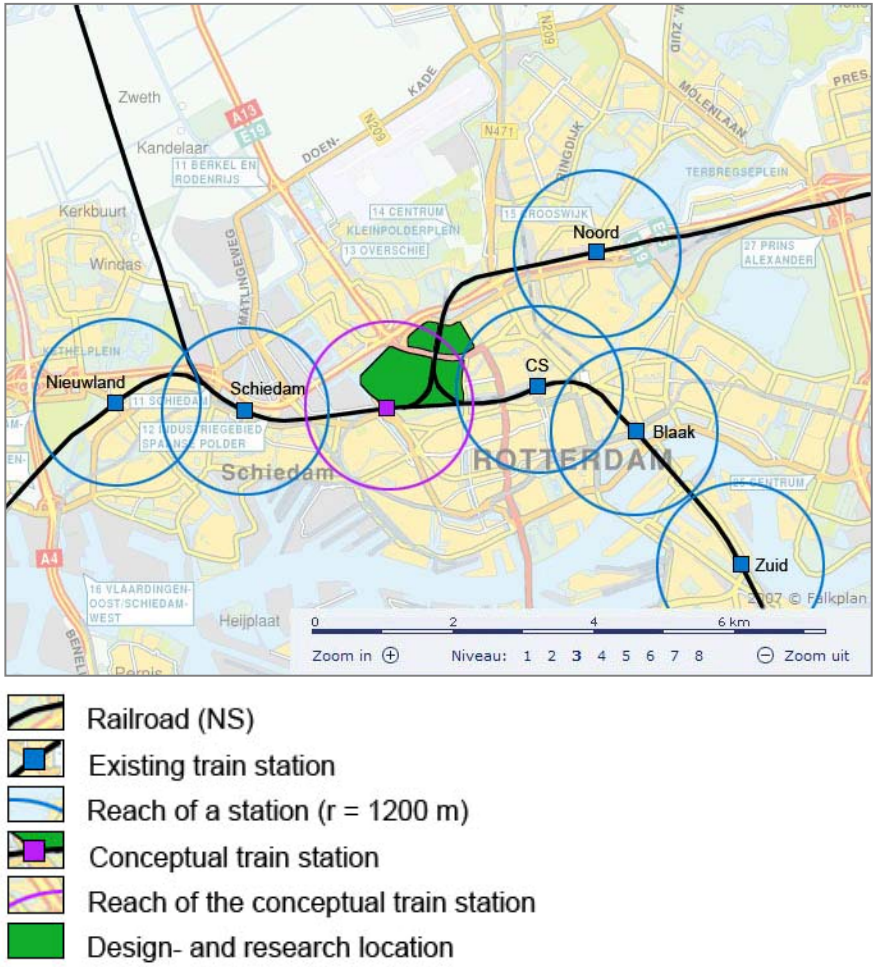


Fig. 29 | Map with existing and a conceptual train station at the south of quadrant C

7 Next steps to take

Like already mentioned in the preface, this design concept is based on the spatial analysis of the clover-leaf location. Until now, the analysis has been focussed on the nowadays situation of the clover-leaf area; problems and advantages are mainly researched.
To enhance the design concept it is necessary to continue the analysis after the P2. From that moment the emphasis will be put on the historical and statistical part, as well as on the demands and needs which proceed from the location and its surroundings.

This means that the first steps after the P2 will be:

Making a historical analysis of the location, and especially:

- the background of the design of the ground plan of Blijdorp Zoo;
- the structure of the complete clover-leaf area before it was built-up, like the pattern of ditches (after all, it ís a polder), banks, roads, plantation, etcetera.

Doing statistical research about the surrounding urban area of the clover-leaf, for example about:

- the housing market: what types of dwellings dominate the area, and are there any special demands, regarding what kind of dwellings are missing?;
- the employment in and around the area;

Completing the spatial and functional analysis with for example:

- making an inventory of facilities in the neighbouring urban districts of the clover-leaf (like Blijdorp and Spangen/ Rotterdam-West): shops, employment, parks, leisure facilities, etcetera;
- until now, there has been emphasis on the zoo, the allotment gardens and the parks. It is still necessary to go deeply into the sports facilities and business activities in the clover-leaf.

Based on these additional points to analyse, the design-concept will be developed further and become more explicit.
Though, at the P3 the analysis will be complete and the design concept can be developed gradually into a detailed design, which will be elaborated until the P5.

8. Real plans concerning infrastructure: Highway, Light-rail, Railroad & Statentunnel

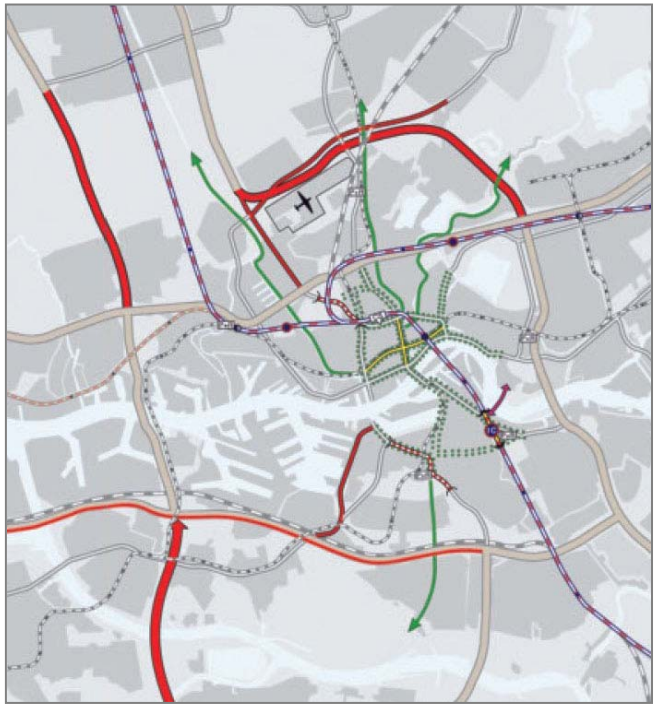


Fig. 30 | Stadsvisie 2007

Real plans like Stadsvisie 2007 or RR2020 argue for a widening of the Diamond of Rotterdam (fig. 30 and 33) with:

- Completion of the A4
- Connecting the A16 with the A13, by making a new route from the Terbregseplein to Rotterdam Airport.

This idea should function better when this new route would be extended to the A4: in that case, a complete, larger Diamond is created (fig. 31 and 34).

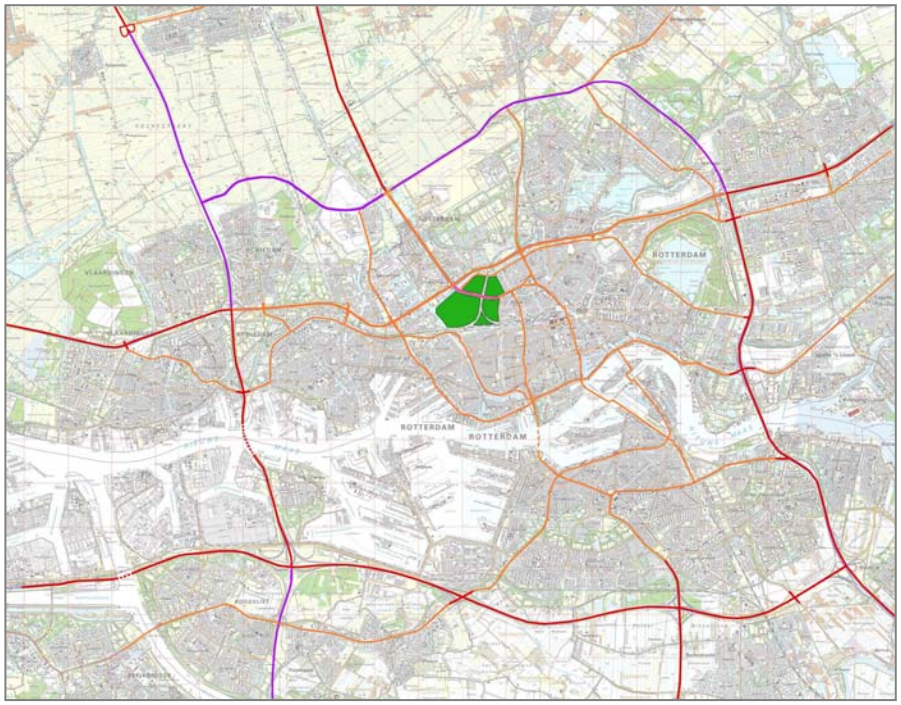


Fig. 31 | Design: Highways in 2020

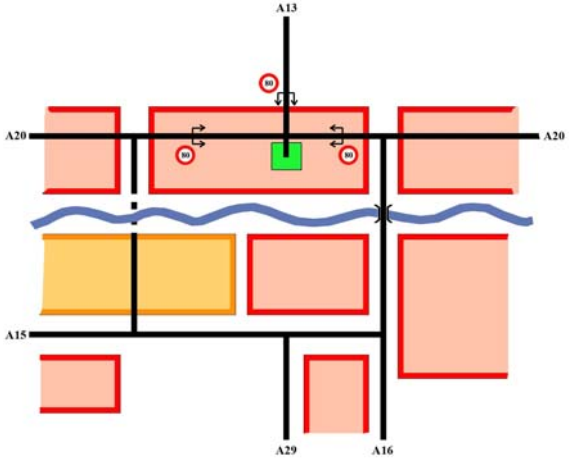


Fig. 32 | Highways in Rotterdam, 2009

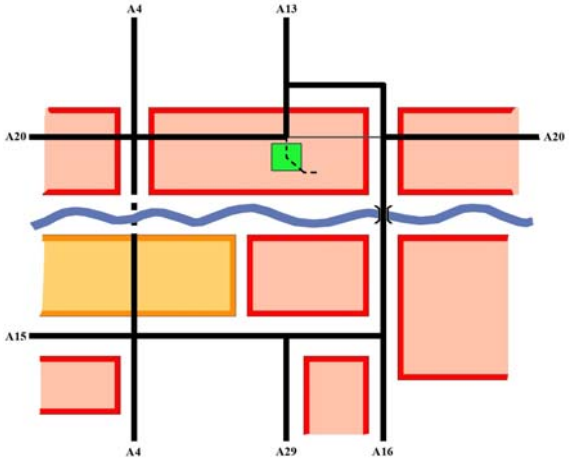


Fig. 33 | Real plans for widening Diamond of Rotterdam

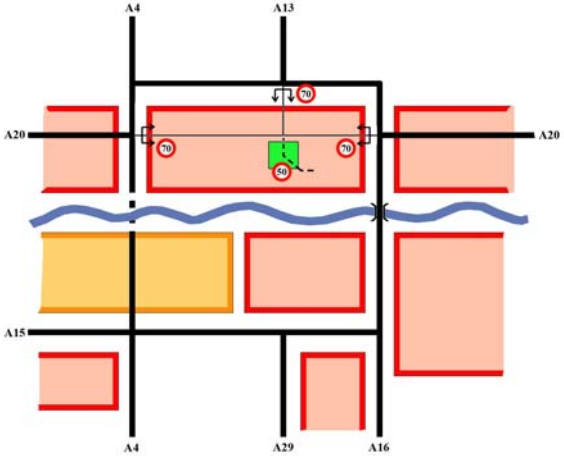


Fig. 34 | Designed highways (2020)

The interventions on the highways around Rotterdam influence the possibilities on the design location. By creating a larger loop around the northern part of Rotterdam (the connection between the Terbregseplein and A13 at the Airport), the original highway A20 will be used less by through traffic. Because the amount of traffic on this part of the A20 will decline, a downgrading of this road becomes possible. On this moment, there is a maximum speed of 80 km/hour at the A20 along the design area. In future, this will be a maximum of 70 km/hour. And more important: the amount of driving lanes will decline to maximum 2 lanes in each direction. The road will get the character and profile of a so called 'Provincial Road'.

Besides, there are more infrastructural lines which count. First the lines which are there yet and will not be changed in the design:

The NS railroads from Rotterdam CS to The Hague and Utrecht will stay. Only the railroad to Hoek van Holland will change into a Light-rail connection, because of the small start- and stop-distances between the stations.
Furthermore, there is an underground Light-rail connection under construction which will replace the existing Hofpleinlijn to The Hague. This line gets a new station next to the design area on the Statenweg.
For car traffic, there are serious plans to dig a tunnel which should connect the city centre directly to the Diamond of Rotterdam; the result of this intervention should be: less through traffic in Rotterdam Blijdorp.
The last important infrastructural line is the HSL, which runs parallel to the NS railroad and cuts the design area in two pieces. Because of the importance of the HSL on national level, this situation will be accepted and therefore not changed in the design.

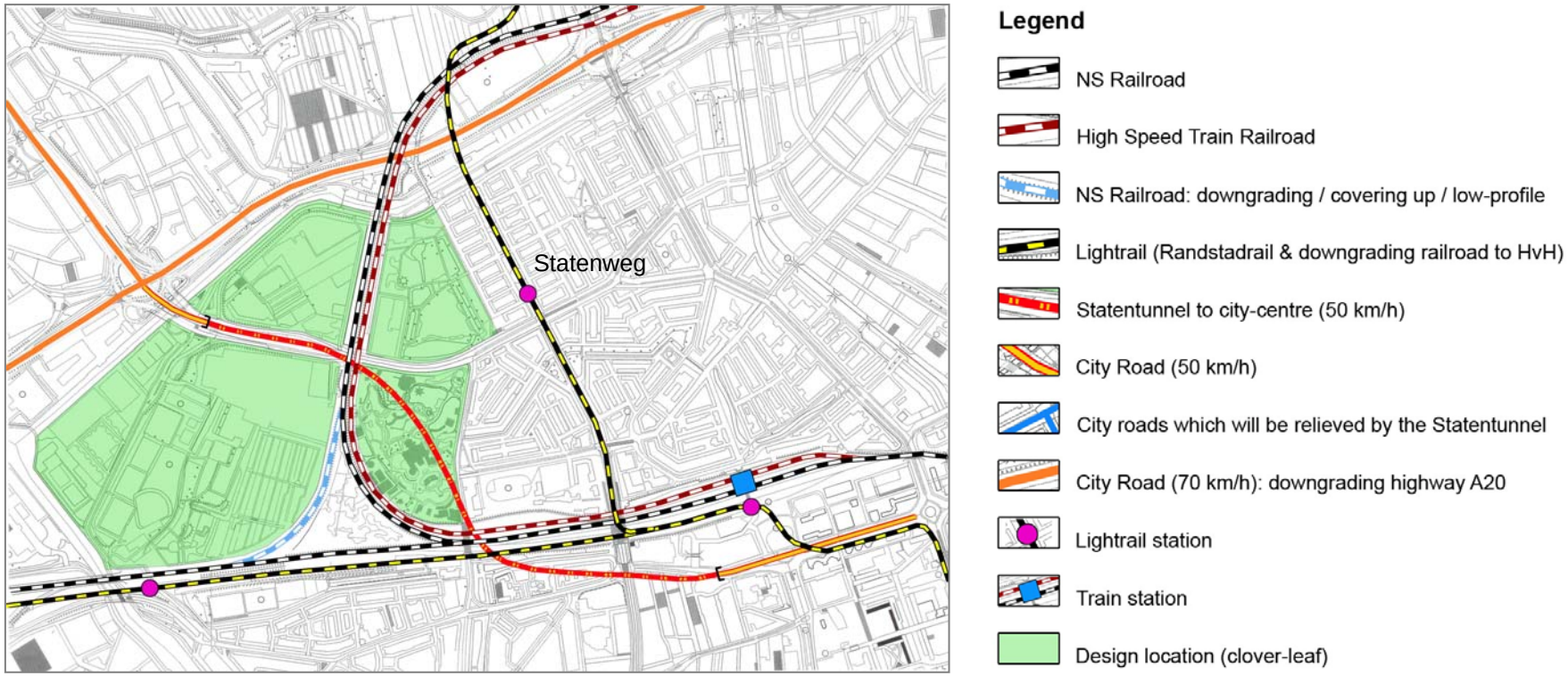


Fig. 35 | Important lines of infrastructure in the design area (reality and plans)

9. Historic soil and pattern

9.1 Dikes and canals

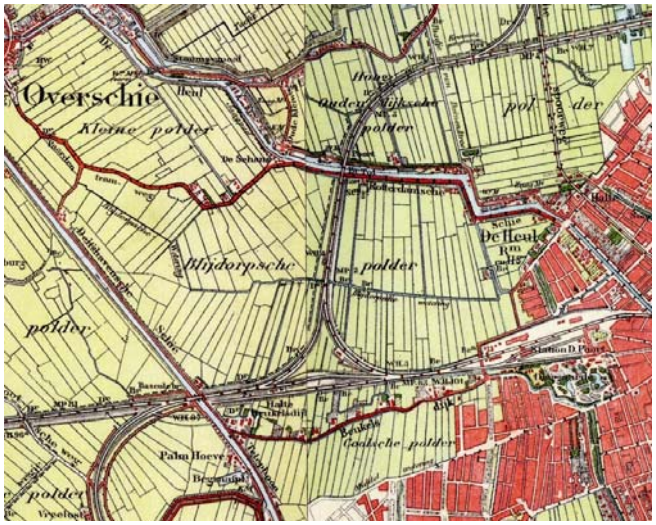


Fig. 36 | Polder of Blijdorp in 1911

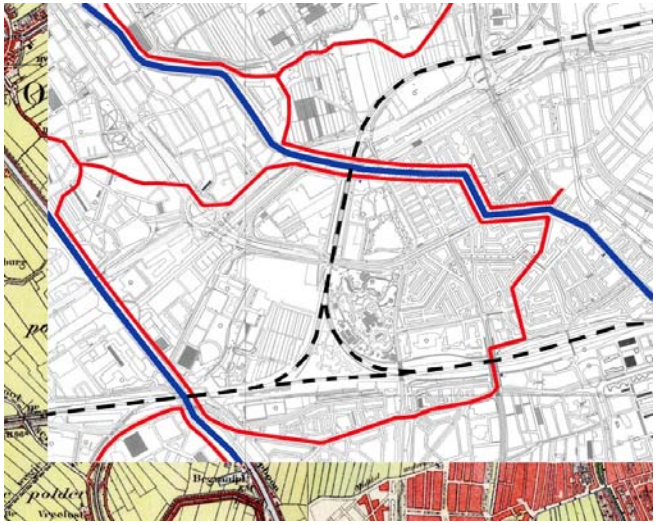


Fig. 37 | Main structuring elements of the landscape (like dikes and canals), projected on nowadays map

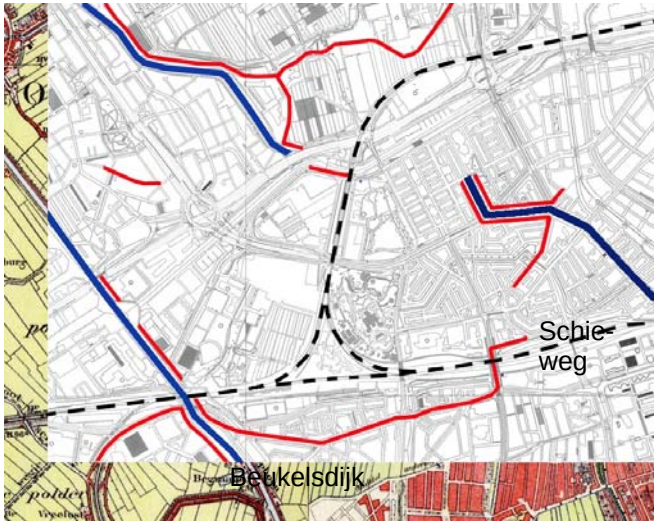


Fig. 38 | Remaining structuring elements which are still recognisable in nowadays situation

The soil pattern of a polder landscape is a very clear one, created by canals and dikes which are the main structures, and smaller structures like ditches. The original situation of the polder landscape in Rotterdam Blijdorp can be seen in fig. 36.
Fig 37 shows these complete main historic structures, projected on the map of the nowadays situation. Fig. 38 shows only those elements which are in this moment still recognisable in the landscape or urban area.
Conclusions of this analysis can be drawn from this comparison:
In the clover-area are no obvious elements still there. Only in the direct surroundings are some items recognisable, like the Schieweg which used to be water in 1911 and the Beukelsdijk which is still there.
In fact, there is no reason to be careful with the historic soil pattern by re-designing this area, because the most structuring elements are disappeared yet and not recognisable anymore in the area.

Legend

- Railway tracks
- Water: canal
- Dike around a polder area
- Main drainage ditch in a polder area
- Pattern of historic small ditches
- Remaining historic ditches in modern layout
- Historic water-route which is nowadays a road

9.2 Pattern of ditches in polder landscape

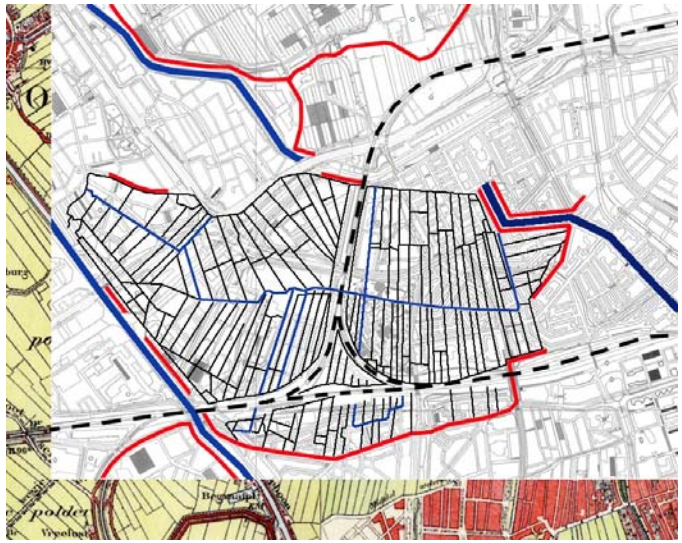


Fig. 39 | Historic ditches, projected on nowadays map

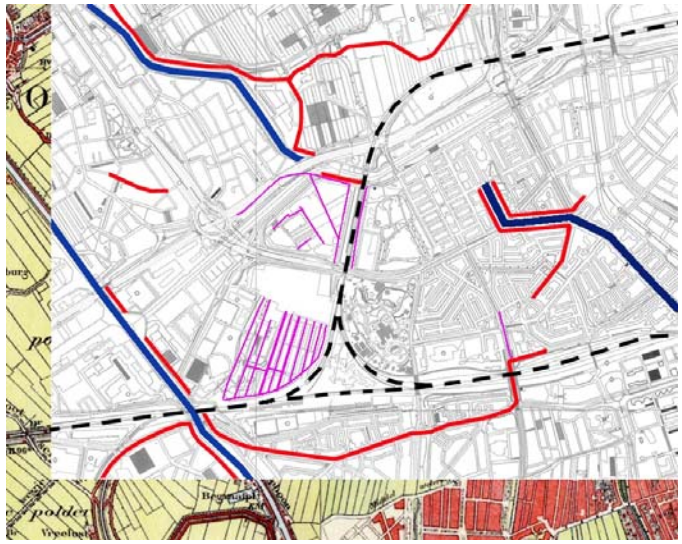


Fig. 40 | Remaining ditches which are still recognisable in nowadays situation

This paragraph is about the smaller elements in a polder landscape which can form a structure, like ditches. Also in this item, there has been made a comparison between the original pattern of ditches in the area and those who remain there on this moment (fig. 39 en 40).
Also in this case there is a very small amount of ditches which is still there in 2009 (the pink marked items in fig. 40). Most of them are located in the south. Nowadays, there is an allotment garden on this location. The ditches and strips of land turned out to be perfect for the parcelling of gardens.
Furthermore, in the north there are still some ditches from the past. But in this area, the ditches are functioning like borders between different activities in the area (camping, tennis courts, allotment garden).
Conclusion of this analysis of smaller structuring elements is:
The ditches in the south are rather obvious, so it could be worth to be very careful by making a new design for this area. For example, when the allotment garden would be replaced by another function, this north-south division could be maintained in order to respect the original function of the area: a polder!

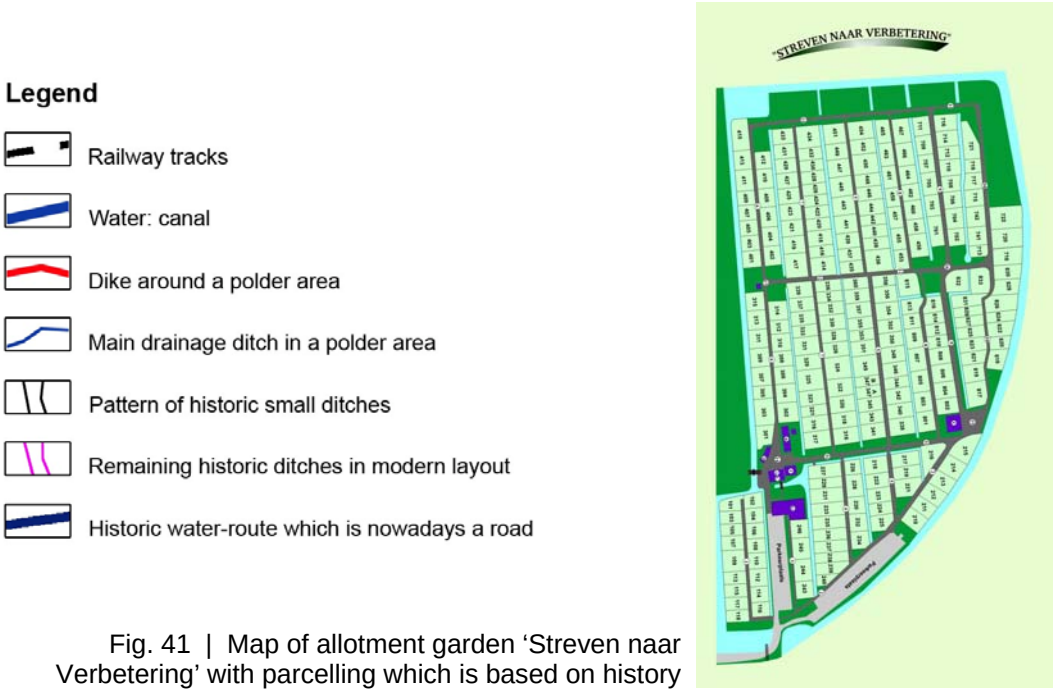
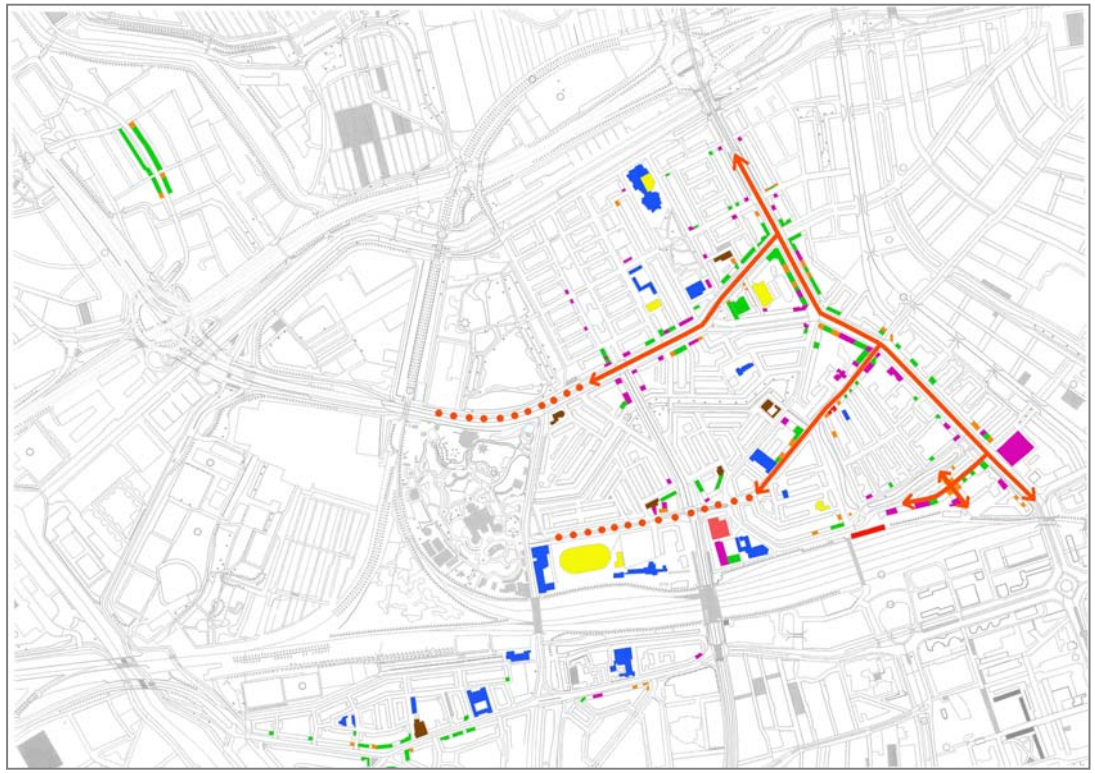


Fig. 41 | Map of allotment garden 'Streven naar Verbetering' with parcelling which is based on history

10. Neighbourhood functions



Legend

- Shop
- Service industries: dentist, creche, post office, employment agency, house-agent, physiotherapist, consultant, etc.
- Restaurant, hotel, pub
- School
- Sports facility
- Church/mosque
- Police office
- Squatted building

For a new design of the clover area, it can be important to know where the concentrations of public functions are. For example about shops, service industries, sports facilities, schools, etc. The analysis leads to 1 north-south oriented concentration on the Schieweg and 2 main east-west concentrations: the Stadhoudersweg and Walenburgerweg. Extending these existing areas can be a starting point for a design decision when it is about placing new public functions in the new design (orange dots in fig. 42).

Fig. 42 | Public functions in direct surrounding of the design area

Fig. 43 | Church at Statensingel

Fig. 44 | Library at Stadhoudersweg

Fig. 45 | Swimming Pool in van Maanenstraat

Fig. 46 | Primary school at Noorderhavekade

11. Analysis of Blijdorp Zoo

11.1 Functional analysis

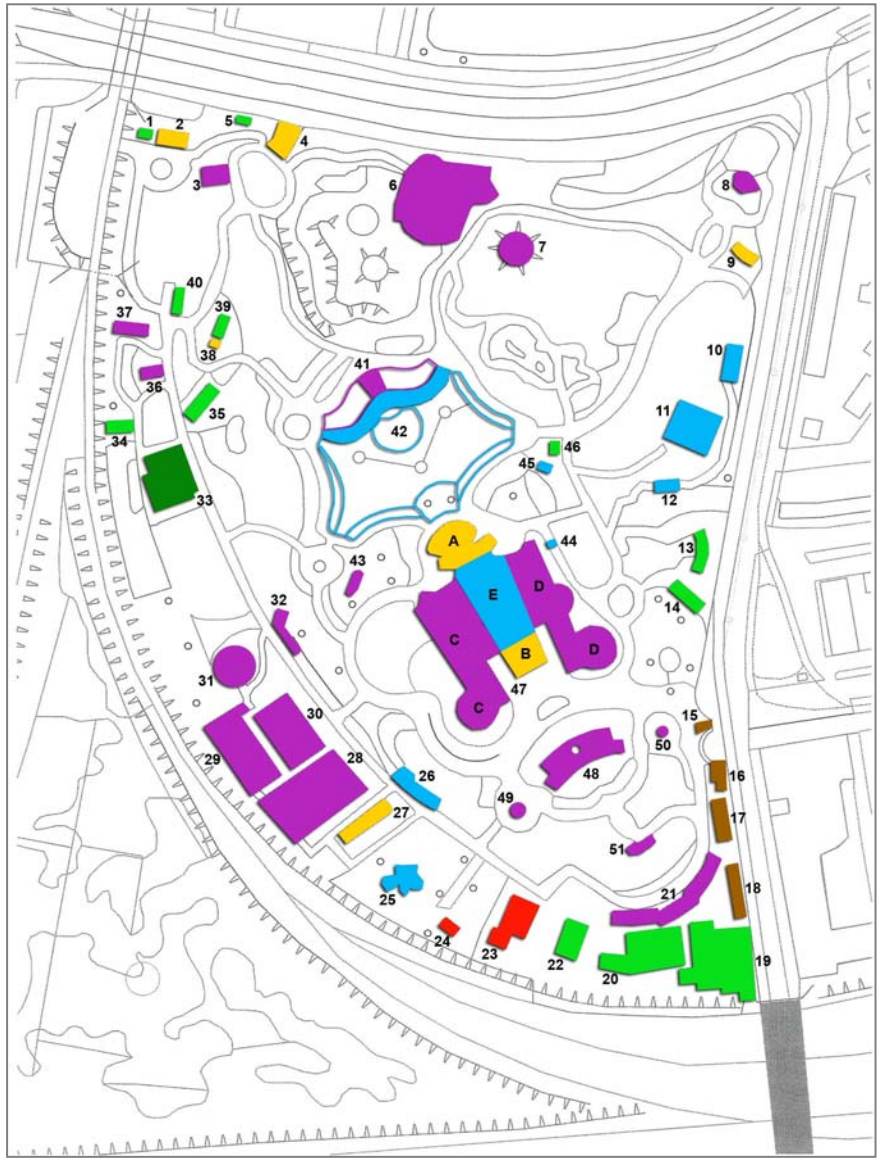


Fig. 47 | Functional analysis of buildings in the zoo

As yet mentioned in the thesis plan, the original ground plan of Blijdorp zoo is from 1940. Through the years, there has been a lot of changes in the zoo. In particular, there has been added a lot of new buildings.
Because of the spatial problems in Blijdorp Zoo, it is realistic to consider a movement of the zoo to another location. In that case, all the buildings in the zoo become vacant. To be able to make a thorough judgement of these buildings (about their quality and flexibility to change into another function), the starting point is to investigate what the specific function of each building is. For example, an office building is more flexible to re-use than a building for animals.
Figure 47 shows the division into 6 kinds of buildings, referring to the legend.

Legend

- Animal cages and nighthouses
- Visitors area
- Restaurant & souvenir shop
- Storage building
- Office building
- Classroom for children education
- Surgery room

1	Electricity building
2	Souvenir shop
3	Monumental nighthouse for tapirs
4	Monumental Lotus serre (tea-lounge)
5	Storage (garbage)
6	Taman Indah (elephants)
7	Bat-cave
8	Monkey-rock
9	Snack-corner
10	Longhouse (classroom)
11	Asia house (exposition)
12	Bird observation post
13	Storage building
14	Storage building
15	Entrance building
16	Office building
17	Office building
18	Office building
19	Storage building
20	Storage building
21	Owl-cage
22	Storage building
23	Classrooms
24	Classrooms
25	Playground
26	Gorilla observation post
27	Restaurant
28	Migratory birdhouse & big aviary
29	Crocodile-'river'-building
30	Butterfly glasshouse
31	Giraffe house
32	Gazelle nighthouse
33	Surgery room & exposition
34	Storage building
35	Storage building
36	Birdhouse & small aviaries
37	Birdhouse & small aviaries
38	Snack corner
39	Storage building
40	Storage building
41	Tiger-'creek'
42	Monumental bridge & pont
43	Nighthouse for rock-goats
44	Chinese ' pavilion'/pagoda
45	Chinese ' pavilion'/pagoda
46	Storage building
47	Monumental Rivierahal
48	Monumental lions & hyenas building
49	Cat roundabout
50	Penguin area
51	Storage & nighthouse for moose

11.2 Judgement of buildings

After the basic functional analysis of the buildings in the zoo, this paragraph will deal with a developed model for judging the zoo buildings, having in mind a possible re-allocation when the buildings should lose their specific aim in case of a movement of the zoo.

This judgement model is based on the Theoretical paper, which handled about the 6F-model (Historic Building Trust, 1995).
The 6F-model claims that the success or failure of a re-allocation project depends on 6 factors:

- Fool (initiator)
- Functionality
- Philosophy (moving force)
- Finance
- Flow (cooperation between participants)
- Phasing (long process → smaller steps)

The conclusions of the Theoretical paper where, that the main factors of success are: The Fool, Functionality and Philosophy.
In this graduation project, I represent the Fool and the Philosophy. The Functionality remains, and this is the base of the judgement model.

The developed model consists of 5 main factors, on which each building can be judged. These main factors are:

The shape of a building: The less a building is dependent on its function, the better (there is more flexibility). For example, the 'Taman Indah', the elephant-house in the zoo, is 100% specialized for this function. It is unthinkable that this building should function as a shop or office building or even a dwelling! On the other hand, the office building next to the entrance of the original zoo is much more flexible: it could function like a dwelling, a general office or even as a building where several dentist have their practice!

Second factor is the size of a building: the amount of surface is important (in general counts: the bigger the building, the easier to re-allocate or divide in several smaller parts). Furthermore, the amount of floors and horizontal division of each floor are important.

Third factor are the materials which are used in the building: How sustainable, liveable and adaptable is the building? For example, because of climate reasons the butterfly glasshouse is not very flexible to use it for other functions.

Fourth factor is the quality of the building: what is the status of maintenance and appearance of it? Is it a new building or a 30-year old one with a lot of outstanding maintenance?

The last factor is a more subjective one. It is an over-all opinion about a building, when thinking about what a building could be in future (the so called suitability). In this case, 3 main future possibilities for the zoo-area are:

- It remains a zoo
- It becomes a public park area
- It turns into a built-up urban area

On the next page, there is a scheme where all the zoo-buildings are judged on these 5 factors of 'Functionality'. Each building is judged with a mark: ++ means very good, + means good, 0 means neutral, - means bad and – means very bad. To be able to count with the marks, they are translated in points (fig. 48):

Legend

– 2	=	– –
– 1	=	–
0	=	0
1	=	+
2	=	+ +

Last but not least, each factor has a certain weight. The weight of the factor determines it importance in the total score. For example: The adaptability of a building is more important than the amount of surface. Adaptability gets a weight factor 3 and the surface gets weight factor 1.

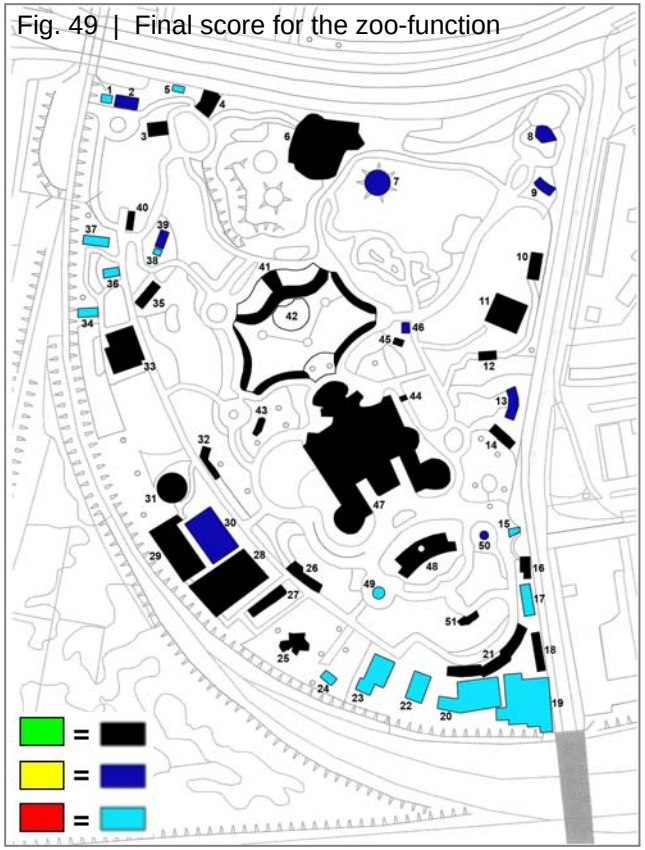
All the marks and weight factors together, each building gets a certain amount of points, which can be translated into a 'report-mark' between 0 and 10.

No.	Description of the building	SHAPE	SIZE		MATERIALS			QUALITY		GESCHIKTHEID VOOR...			FINAL SCORE FOR...					
		verbinding vorm-functie	oppervlak surface	indeling/ verdiepingen	duurzaam sustainability	leefbaar liveability	aanpasbaar adaptability	onderhouds-status	uitstraling (subjectief)	Zoo	Park	Urban area	Zoo		Park		Urban area	
													Points	Grade	Points	Grade	Points	Grade
	weight of each factor –>	2	1	1	1	2	3	1	3	3	3	3	-14 tot +14	0-10	-34 tot +34	0-10	-34 tot +34	0-10
1	Electricity building	-1	-2	-2	2	-2	-1	2	-2	0	0	1	-4	3,6	-15	2,8	-12	3,2
2	Souvenir shop	-2	-1	-1	0	-1	0	1	-1	2	1	0	4	6,4	-7	4,0	-10	3,5
3	Monumental nighthouse for tapirs	1	1	1	2	1	1	0	2	2	1	2	12	9,3	20	7,9	23	8,4
4	Monumental Lotus serre (tea-lounge)	1	1	1	2	1	1	1	2	2	1	2	13	9,6	21	8,1	24	8,5
5	Storage (garbage)	-1	-2	-1	-1	-2	-1	0	-2	-1	-1	-2	-9	1,8	-22	1,8	-25	1,3
6	Taman Indah (elephants)	-2	1	0	1	-2	-2	1	0	2	0	-1	7	7,5	-11	3,4	-14	2,9
7	Bat-cave	-2	0	-1	1	-2	-2	1	-1	2	1	-2	4	6,4	-13	3,1	-22	1,8
8	Monkey-rock	-2	-1	-2	1	-2	-2	0	0	1	1	-2	3	6,1	-13	3,1	-22	1,8
9	Snack-corner	0	1	1	1	0	0	0	1	0	0	0	3	6,1	6	5,9	6	5,9
10	Longhouse (classroom)	-2	1	1	1	1	1	1	1	2	1	0	10	8,6	11	6,6	8	6,2
11	Asia house (exposition)	-2	2	1	1	0	1	1	1	2	1	0	10	8,6	10	6,5	7	6,0
12	Bird observation post	-2	0	0	0	-1	0	1	1	2	2	-1	10	8,6	4	5,6	-5	4,3
13	Storage building	0	1	1	1	0	1	1	0	1	-1	0	4	6,4	4	5,6	7	6,0
14	Storage building	0	1	1	1	1	1	1	1	1	-1	1	7	7,5	9	6,3	15	7,2
15	Entrance building	-2	-2	-1	0	-1	-2	0	-1	1	-1	-1	0	5,0	-21	1,9	-21	1,9
16	Office building	1	1	1	2	2	1	1	2	2	1	2	13	9,6	23	8,4	26	8,8
17	Office building	1	1	0	0	1	1	1	0	0	-1	1	1	5,4	6	5,9	12	6,8
18	Office building	1	1	1	2	2	1	1	1	2	0	2	10	8,6	17	7,5	23	8,4
19	Storage building	-1	1	0	-1	-2	-1	0	-2	0	-2	-1	-6	2,9	-21	1,9	-18	2,4
20	Storage building	-1	1	0	0	-2	-1	0	-2	0	-2	-1	-6	2,9	-20	2,1	-17	2,5
21	Owl-cage	-1	-1	0	1	0	-1	0	2	2	1	1	12	9,3	4	5,6	4	5,6
22	Storage building	-2	1	1	1	-1	-1	1	-1	0	-1	0	-2	4,3	-11	3,4	-8	3,8
23	Classrooms	0	1	1	1	1	1	0	-2	0	-1	1	-6	2,9	-1	4,9	5	5,7
24	Classrooms	0	-1	0	1	0	0	0	-2	0	-1	0	-6	2,9	-9	3,7	-6	4,1
25	Playground	-1	2	0	0	1	-1	2	1	2	2	2	11	8,9	10	6,5	10	6,5
26	Gorilla observation post	-2	0	0	0	-1	1	1	0	2	1	-2	7	7,5	1	5,1	-8	3,8
27	Restaurant	0	1	1	1	1	1	1	0	2	1	0	7	7,5	12	6,8	9	6,3
28	Migratory birdhouse & big aviary	-2	1	0	0	-1	-1	1	0	2	1	-2	7	7,5	-4	4,4	-13	3,1
29	Crocodile-'river'-building	-2	1	0	1	-1	-1	1	0	2	-2	-2	7	7,5	-12	3,2	-12	3,2
30	Butterfly glasshouse	-2	1	0	-1	-2	-1	0	-1	2	0	-1	3	6,1	-14	2,9	-17	2,5
31	Giraffe house	-2	1	0	1	0	-2	2	0	2	1	-2	8	7,9	-3	4,6	-12	3,2
32	Gazelle nighthouse	-1	1	1	0	0	1	0	1	1	1	1	6	7,1	9	6,3	9	6,3
33	Surgery room & exposition	1	1	2	1	1	2	1	1	1	0	2	7	7,5	18	7,6	24	8,5
34	Storage building	-1	-1	0	1	-1	-1	0	-1	0	-1	-1	-3	3,9	-13	3,1	-13	3,1
35	Storage building	0	1	1	1	1	1	1	1	1	0	1	7	7,5	12	6,8	15	7,2
36	Birdhouse & small aviaries	-2	-1	-1	-1	-2	-1	-1	-1	1	1	-1	-1	4,6	-15	2,8	-21	1,9
37	Birdhouse & small aviaries	-2	0	-1	-1	-2	-1	-1	-1	1	1	-1	-1	4,6	-14	2,9	-20	2,1
38	Snack corner	-2	-1	-1	0	0	-1	1	-1	1	1	0	1	5,4	-8	3,8	-11	3,4
39	Storage building	-1	0	1	1	0	1	0	0	1	0	0	3	6,1	3	5,4	3	5,4
40	Storage building	0	1	1	1	0	2	1	1	2	1	1	10	8,6	16	7,4	16	7,4
41	Tiger-'creek'	-2	0	-1	0	0	1	0	0	2	0	-2	6	7,1	-2	4,7	-8	3,8
42	Monumental bridge & pont	0	2	0	1	0	0	1	2	2	2	2	13	9,6	16	7,4	16	7,4
43	Nighthouse for rock-goats	-1	0	0	0	-1	1	0	1	1	0	-1	6	7,1	2	5,3	-1	4,9
44	Chinese 'pavilion'/pagoda	-2	-1	0	2	0	1	2	2	2	2	0	14	10,0	14	7,1	8	6,2
45	Chinese 'pavilion'/pagoda	-2	-1	0	2	0	1	2	2	2	2	0	14	10,0	14	7,1	8	6,2
46	Storage building	-1	-1	-1	1	-1	0	0	0	1	0	-1	3	6,1	-5	4,3	-8	3,8
47	Monumental Rivierahal	0	2	1	2	1	2	1	2	2	1	2	13	9,6	23	8,4	26	8,8
48	Monumental lions & hyenas building	0	1	1	1	1	1	-1	2	2	1	1	11	8,9	16	7,4	16	7,4
49	Cat roundabout	-2	-1	-1	-1	-1	-1	-1	-1	1	0	-2	-1	4,6	-16	2,6	-22	1,8
50	Penguin area	-1	-2	-1	0	-1	1	1	0	1	0	-2	4	6,4	-3	4,6	-9	3,7
51	Storage & nighthouse for moose	-2	-1	0	0	-1	1	0	1	1	-1	-2	6	7,1	-4	4,4	-7	4,0

Fig. 48 | Judgement scheme

* Please note that for the zoo only the quality and suitability are taken into account for the final score. Because shape, size and materials do not matter, when we assume that those items are always positive (an elephant building is for an elephant only, and we assume that this functions like they want)

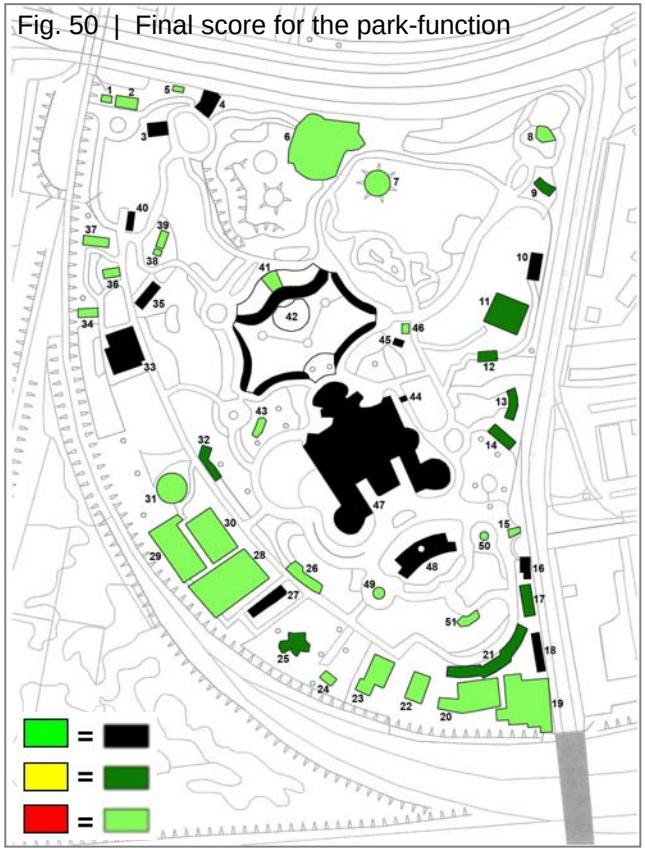
Fig. 49 | Final score for the zoo-function



Legend

- Large potential: suitable building for a zoo
- Medium potential
- Small potential: not a suitable building for a zoo (on this moment it fits, but it is not necessary on its place and with its current appearance)

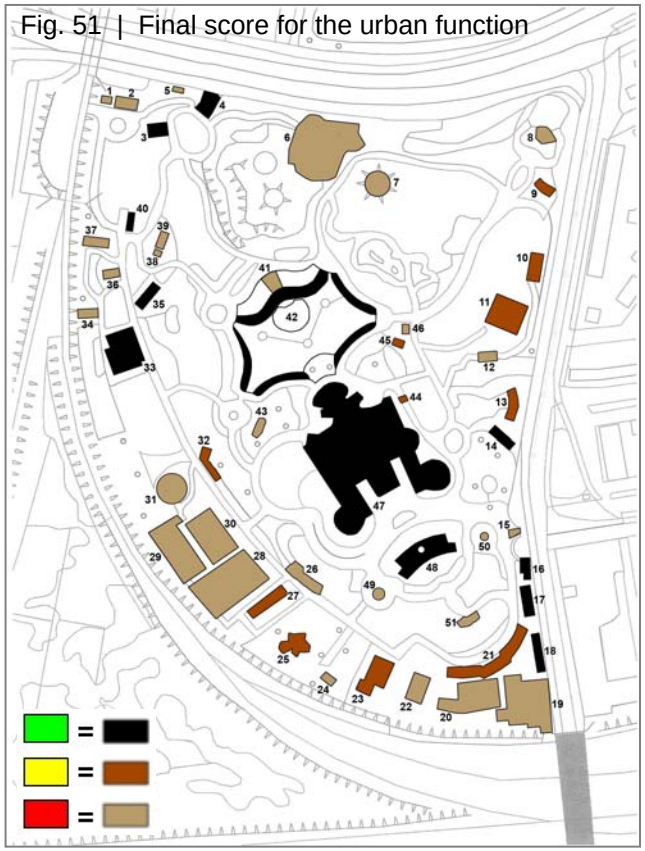
Fig. 50 | Final score for the park-function



Legend

- Large potential: suitable building for a park (when building is re-allocated)
- Medium potential: depending on future design, building can be preserved, but not necessarily
- Small potential: not a suitable building for a park

Fig. 51 | Final score for the urban function



Legend

- Large potential: suitable building for an urban area (when building is re-allocated)
- Medium potential: depending on future design, building can be preserved, but not necessarily
- Small potential: not a suitable building for an urban area

The final scores for each destination are translated into maps, to make it visually and possible to compare. The lighter the colour of the building, the less suitable it is for that specific function.

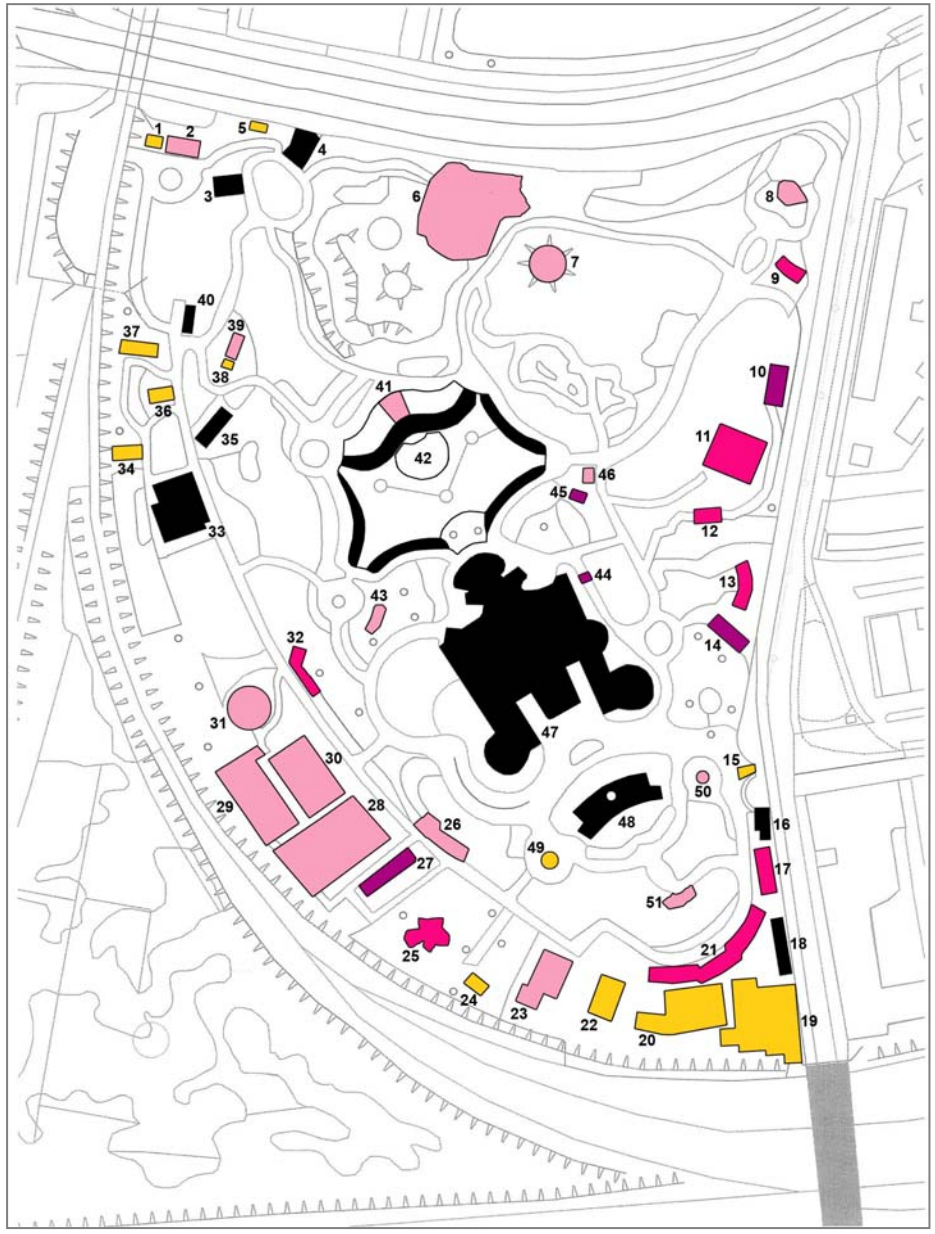


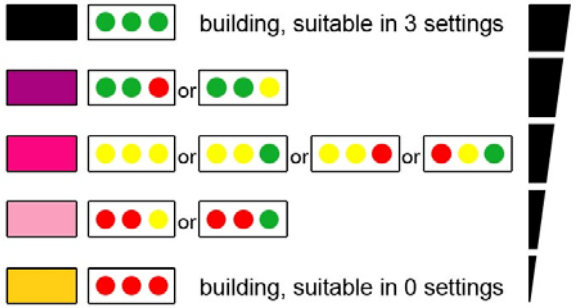
Fig. 52 | Overlap map for all possible future functions together

To draw conclusions about the best suitable functions, whatever the future will bring, the maps of fig. 49, 50 and 51 can be brought together in 1 complete map.

This map consists of 5 colours. Also in this case counts: the darker the colour, the better that building is judged for all functions together. For example: black buildings have the best perspective for re-allocation (3x green), purple buildings are also rather good, because they score 2x green and 1x yellow or red.

FINAL SCORE FOR...					
Zoo		Park		Urban area	
Points -14 tot +14	Grade 0-10	Points -34 tot +34	Grade 0-10	Points -34 tot +34	Grade 0-10
-4	3,6	-15	2,8	-12	3,2
4	6,4	-7	4,6	-10	3,5
12	9,3	20	7,9	23	8,4
13	9,6	21	8,1	24	8,5
-9	1,8	-22	1,8	-25	1,3
7	7,5	-11	3,4	-14	2,9

Legend



Conclusion: Mainly the monumental buildings score very well, and the specific animal houses rather bad. In between is a ‘medium’ variety of buildings for visitors, office buildings and horeca.

11.3 Original zoo-design versus nowadays situation

Blijdorp Zoo often changed during the years. The original design, as shown in figure 54, was based on 1 central axis which cuts oblique through the area. On the axis the most spectacular animals and buildings are placed and the surroundings are filled with grazing fields for animals. More or less, these fields are placed, reflected at the axis.
The original ground plan is projected on the map of the current situation of the zoo (fig. 53). It is obvious that the surface has increased, and with this increase the original ground plan changed a little, because of new connections (on the west side) which had to be established.

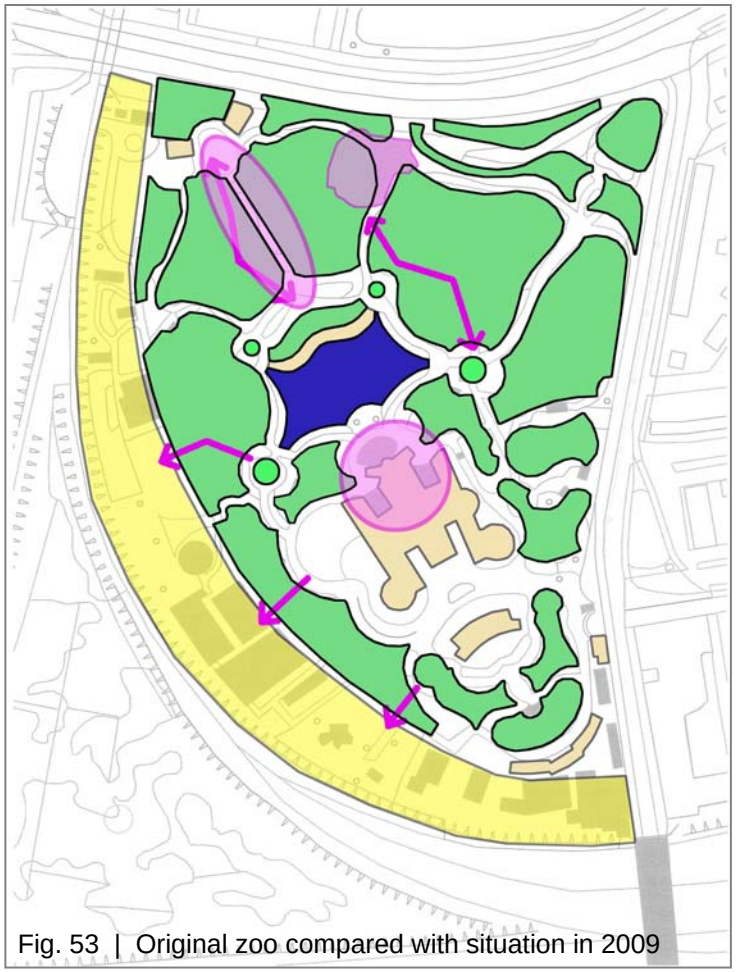


Fig. 53 | Original zoo compared with situation in 2009

Furthermore, the shape of some grazing fields changed, for example because of the addition of elephant-house 'Taman Indah'. An other grazing field got new walking routes through it, and (concerning the historical elements) the former 'Papegaaienlaan' disappeared. With this change the parrots disappeared, but also an important viewing line from the bridge over the pond to the tea lounge (originally giraffe-house) is gone. Regarding the monumental buildings: the Rivièrahal lost his tower and there has been added a restaurant on the north.

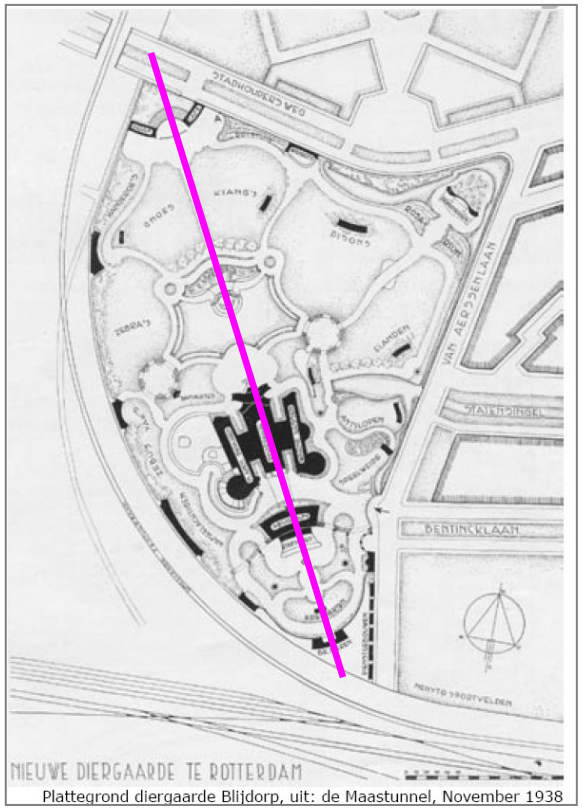


Fig. 54 | Groundplan of the zoo in 1940 (de Vries, 1986)

11.4 Landscapes in the zoo

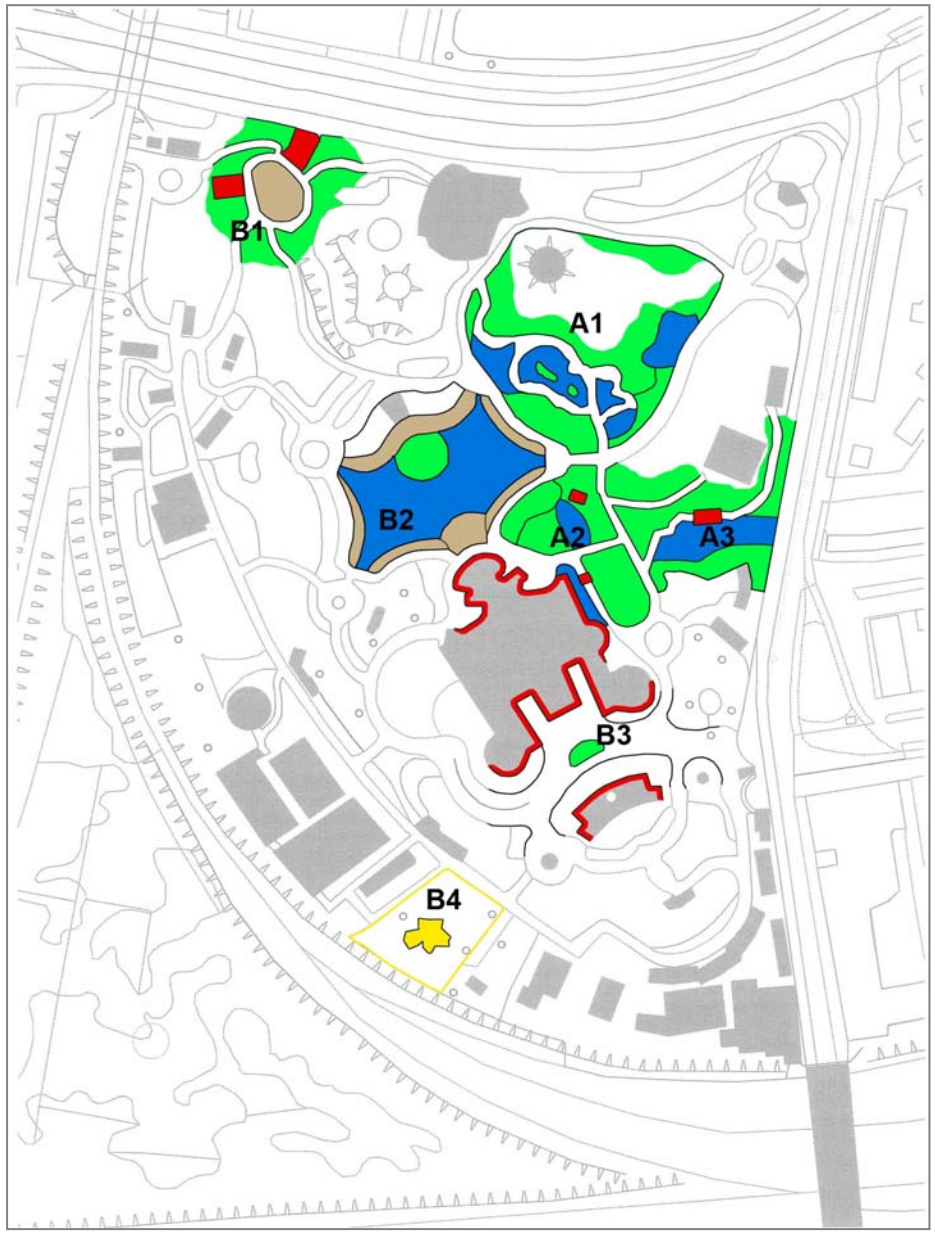


Fig. 55 | Special landscapes in the zoo area

Considering the possibility to change the surface of Blijdorp Zoo into another function (because of the spatial problems) it is worth to take a look at the different landscapes in the area, which are not irrevocable connected to the function of a zoo.

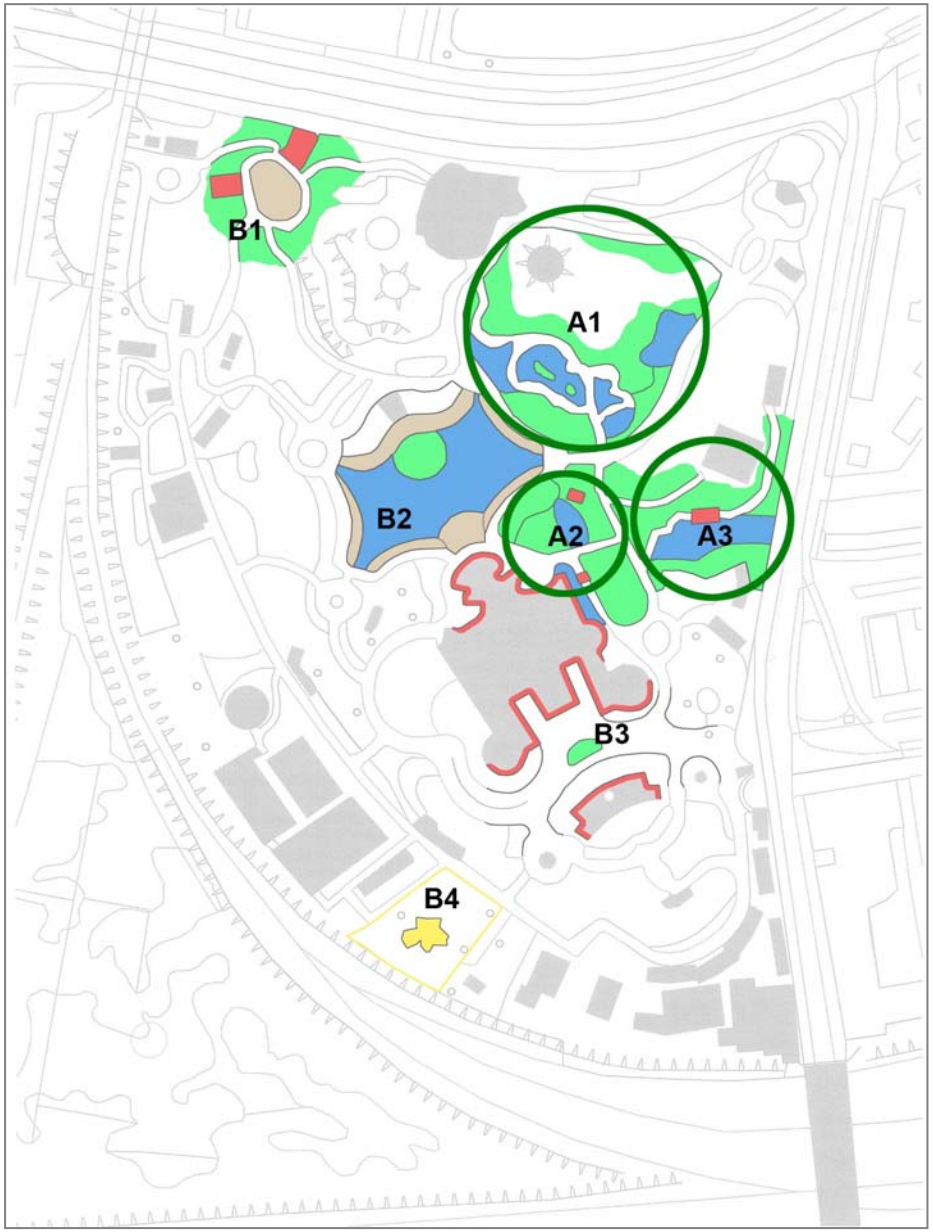
In other words: which elements in the landscape are

- too beautiful to demolish;
- flexible to be absorbed into an other function
- technical in a good state

Analysis makes clear that there are 2 kinds of landscapes which are valuable, namely:

A - Natural landscapes; these landscapes contain areas filled with plantation en water, sometimes combined with a building. They are valuable because they do not primarily function by being put into the service of animals, but to a great extent they are also meant for people to stay, to relax, to walk, to sit or to discover new things. In the zoo it concerns a swamp landscape, a Chinese garden and a bird observation post in the middle of water and natural banks.

B - Urban landscapes; these landscapes are also not direct connected with animals, but it are places with a character that also should fit in an urban neighbourhood. Main materialisation is brick, stone and sometimes water. In the zoo it concerns 2 squares, embraced by buildings, a pond with walking paths around it and a playground for kids.



NATURAL LANDSCAPES

A1 Swamp landscape: twisting foothpaths, small islands and plank bridges

A2 Chinese garden

A3 Bird observation post in the middle of water and natural banks

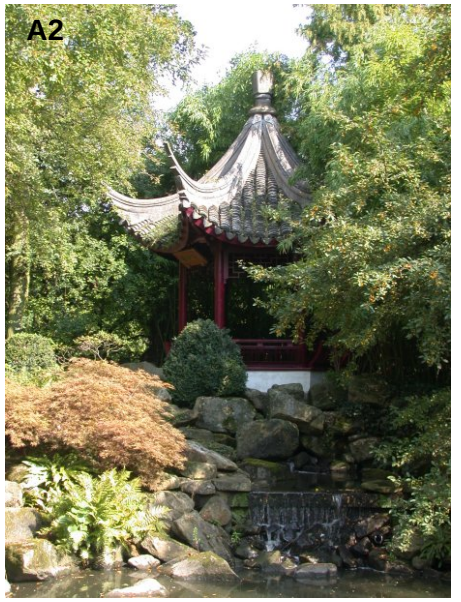
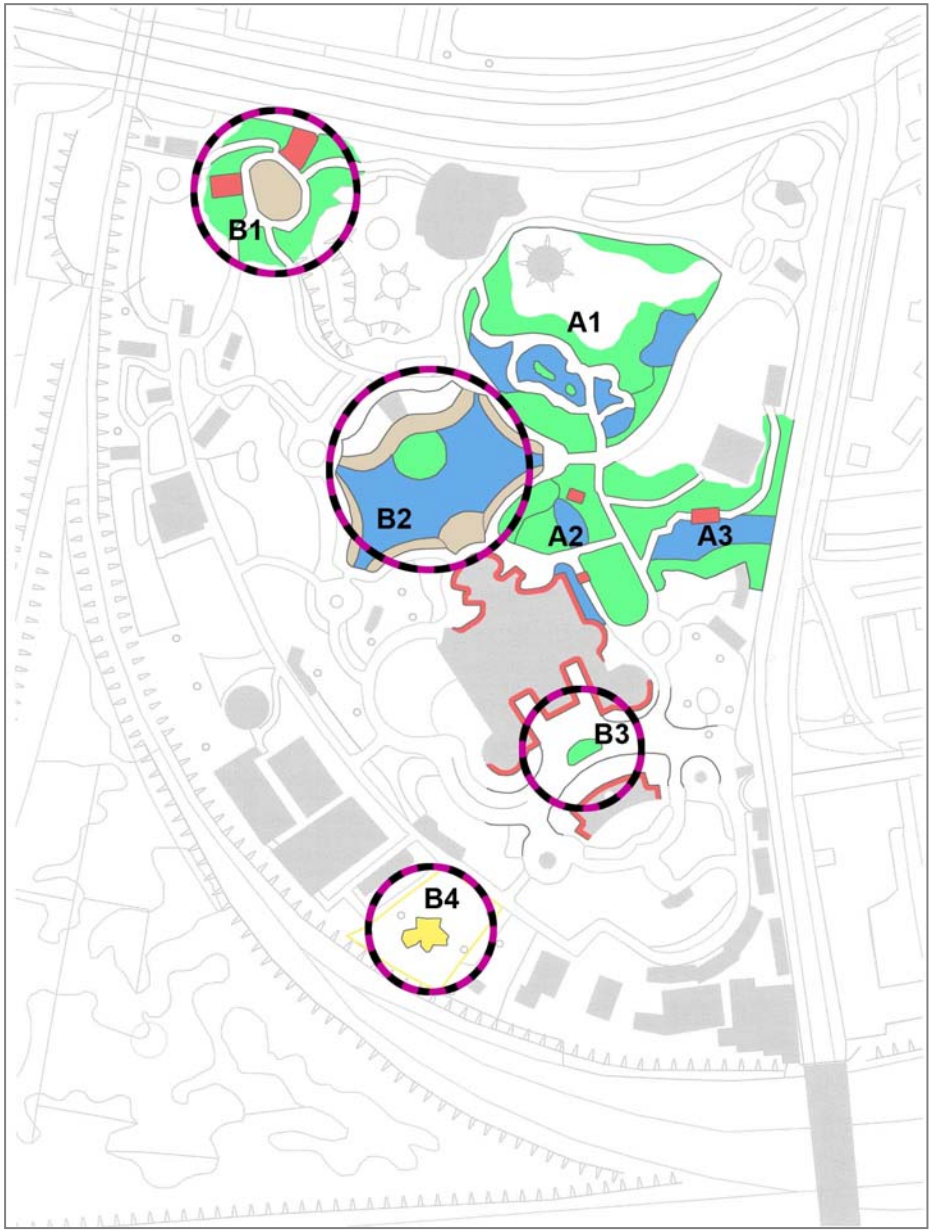


Fig. 56 | Natural landscapes



URBAN LANDSCAPES

B1 Terrace square: rest and relax function

B2 Urban pond with bridge and foothpaths along

B3 Urban square: connecting function

B4 Playground: active function

Fig. 57 | Urban landscapes

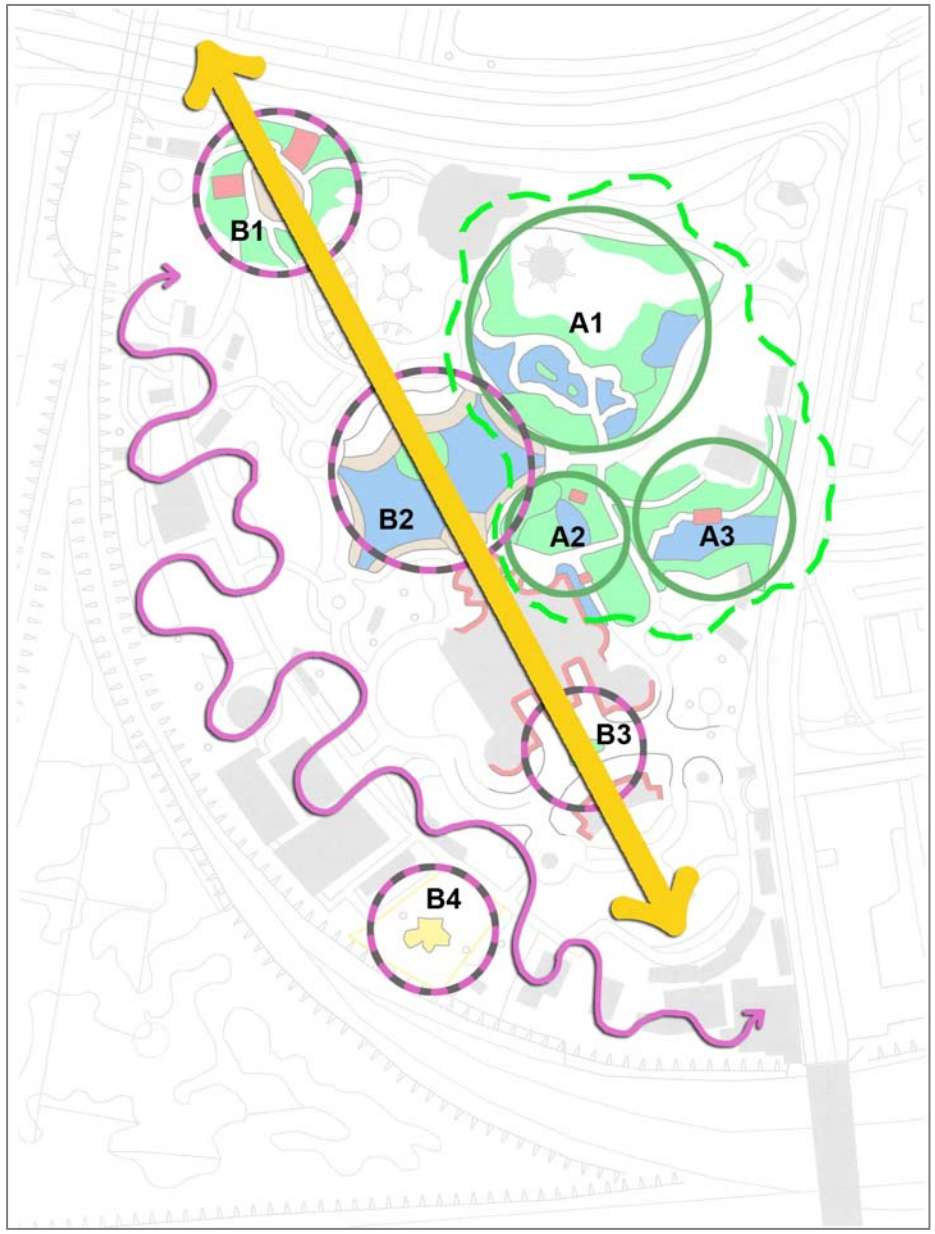


Fig. 58 | Analysis of cohesion between different landscapes

From the analysis of the different landscapes in the zoo can be drawn some conclusions which could be helpful to make design decisions.

- The special natural landscapes are concentrated in the north-east corner of the zoo. When walking through this area, on the first sight it looks like a normal public park.
- The urban landscapes are placed on the main axis, which was the base point of the whole design by van Ravesteyn. Although it is not a functional axis (it is impossible to walk directly from south to north), but an organisation-axis, it is a very clear one; where-ever you are, the axis is always near.
- The west side of the zoo is the most messy one: no special landscapes over here (only a playground), no special route, and the buildings at this strip of land clearly form a ‘back’ of the zoo.

12. Preliminary design at P3

12.1 Starting points for design, concluded after the analysis

The elaborated analysis between the P2 and P3 results in a list of conclusions, and therefore starting points for the preliminary design at this moment:

- Historic pattern of canals, dikes and ditches:
  Some historic patterns are recognizable in nowadays maps, but there are barely any more ‘anchors’ to re-use and emphasize in a new design.

- Functions in surrounding neighbourhood:
  The most busy streets invite to extend these public areas into a future design; these are the most logical extensions.

- Possibilities for re-allocation of (Monumental) zoo-buildings:
  The results of the judgement scheme give clarity about the ability of buildings to re-allocate them. The results of this scheme are leading, but exceptions are possible. For example, when the area should turn into an urban area it is not necessary to remain áll buildings which scored a ‘green’ mark, if there is no spatial or functional reason to keep them. The results only make obvious which buildings maximal could be re-used for other purposes (and which absolutely can not be used!).

- Original design of Blijdorp Zoo:
  It is worth to try to bring back the important historic elements of the original design, like the complete main axis and the shape of the grazing lands. This conclusion mostly argues for remaining the zoo or turning it into a public park, because

- Landscapes in Blijdorp Zoo:
  Some natural landscapes as well as urban landscapes are valuable, no matter what the future function will be. Please note that only the natural landscapes are pretty difficult to mix in case of developing an urban area.

- Finally, the more general analysis of infrastructural lines in the design area:

  As mentioned yet in chapter 8, there is yet acceptance about the routes and shape of the NS railroad and the HSL.

  Furthermore, the changes about the extending and downgrading of highways around Rotterdam is made clear (A13 and A20 downgrading to a Provincial road with maximum 2 driving lanes in each direction and a maximum speed of 70 km/h on the A20 and 50 km/h at the A13).

  The new light-rail to The Hague which is being developed on this moment, together with the future intention to change the railroad to Hoek van Holland into a light-rail, is also a decision which will be taken over in this graduation design.

  The last factor is the Statentunnel from the A13 directly to the city-centre. Because this is not a complete developed plan yet, in this project is assumed that it is not yet 100% certain if this tunnel will be build in future.

  This leads to 2 design alternatives: one with a tunnel and 1 without. An other variable which is introduced on this moment is the choice to give the clover-area a green or red character. This means: will the emphasis be on nature, recreation, green and water or mainly on urban developments? These 4 variables result in 4 design alternatives at the P3, which are visualised in this scheme:

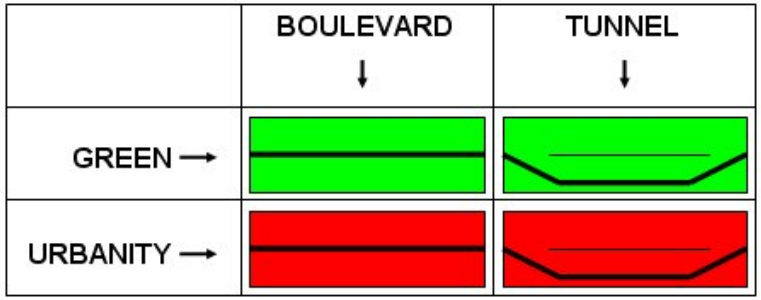


Fig. 59 | Scheme with design alternatives at the P3

12.2 Design alternatives

These 4 design alternatives are explained more detailed in the next paragraphes. Before zooming in on each alternative, the scheme of fig. 59 is translated into a more clear scheme in fig. 60. The legend on this page counts for every alternative.

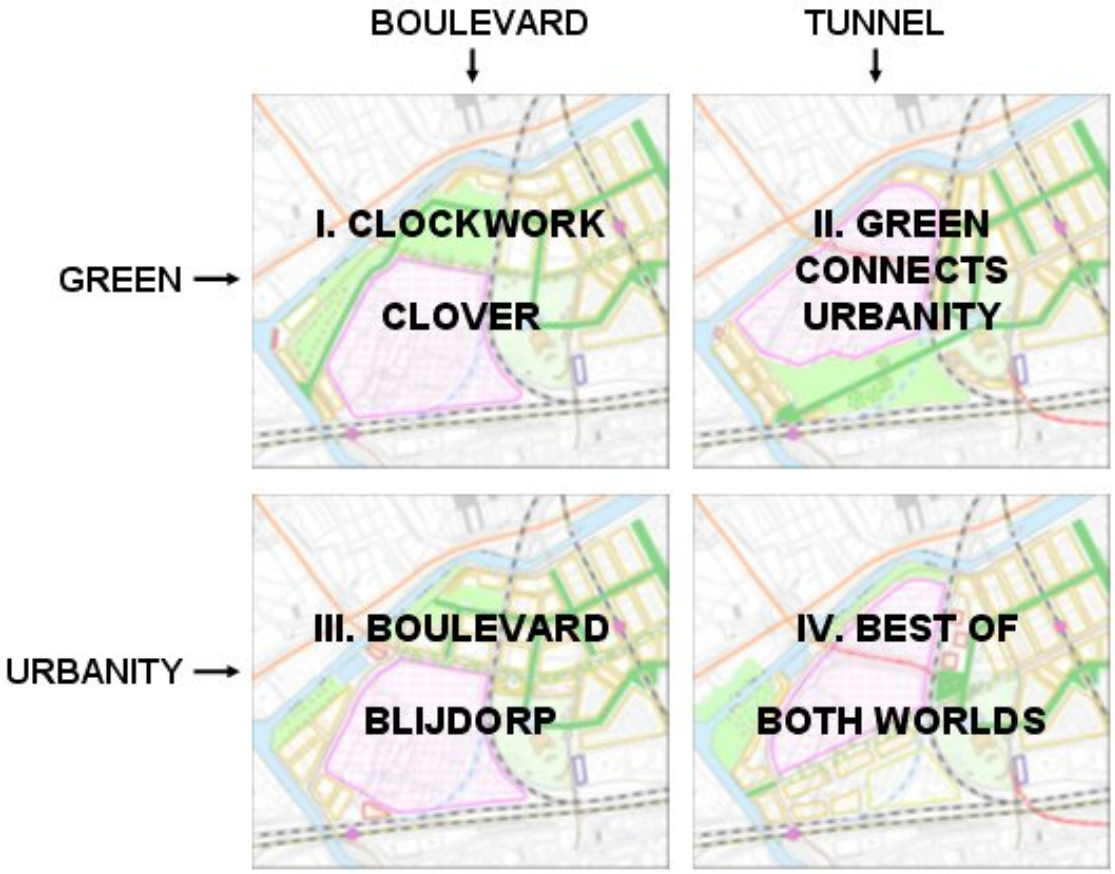


Fig. 60 | Design alternatives

12.2.1 Design alternative I: Clockwork clover

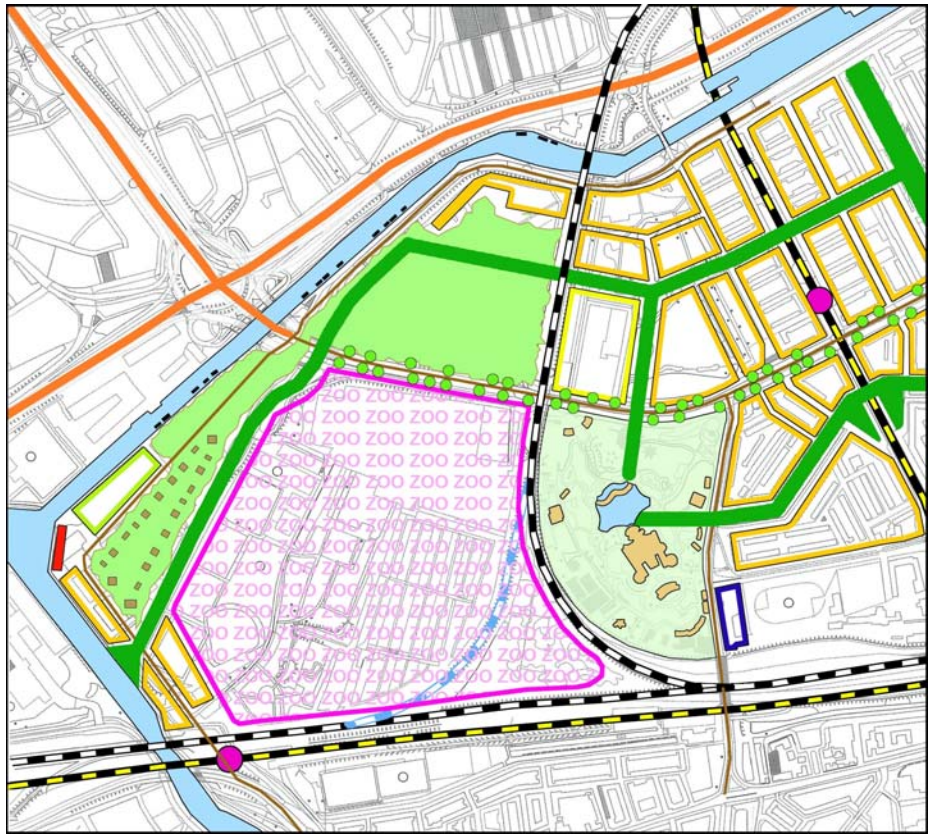


Fig. 61 | Concept map: combination of ‘green’ and ‘boulevard’

This concept is based on the clockwork-principle: the function and character of each clover-leaf turns 90 degrees clockwise: zoo becomes park, sports area becomes the new zoo, etc. In this case, the green structures are extended (like the Statensingel) into the clover, and this green ‘backbone’ connects the different parts of the clover. The zoo is situated on 1 complete clover-leaf and the north-west clover-leaf almost completely turns into 1 big allotment garden instead of 2 smaller ones like now. Summarizing, this alternative is mainly about more efficient and logical use of space with a green character.

12.2.2 Design alternative II: Green connects urbanity

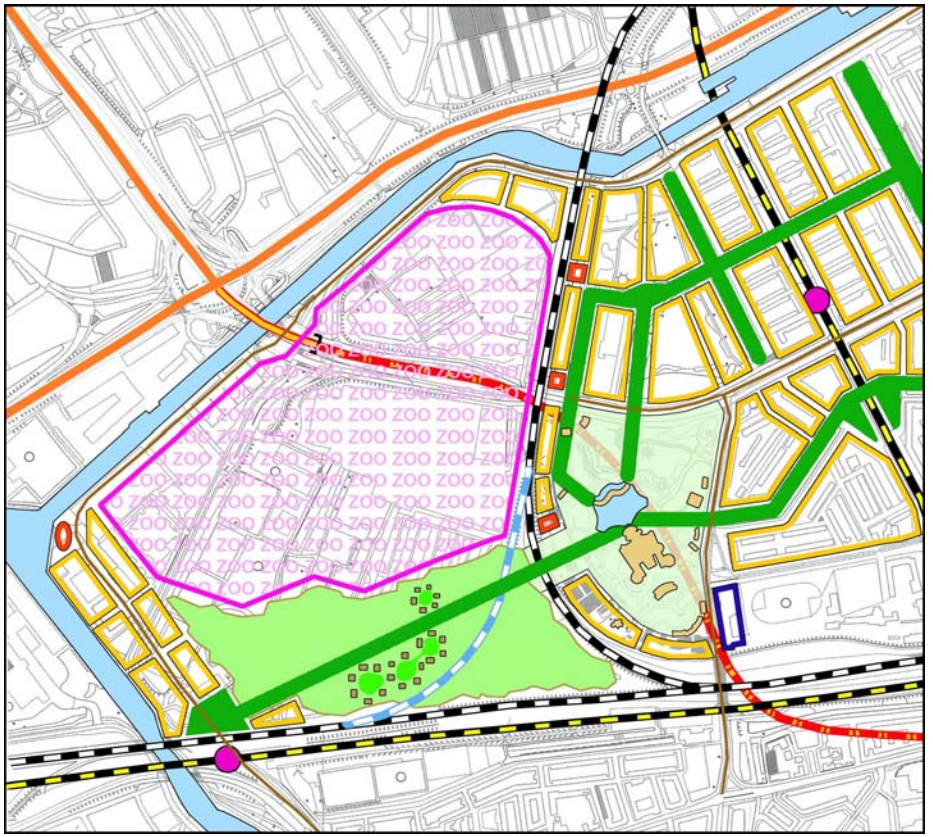


Fig. 62 | Concept map: combination of ‘green’ and ‘tunnel’

This second alternative has also a ‘green’ base, with but the addition of the Statentunnel. This makes a very big zoo possible, spread over 2 clover-leafs. The old zoo becomes a public park, surrounded by buildings. Between this new park and the new light-rail station at Spangen, there will be a green connection: a variety on allotment gardens, but with a public character. This green connection is again a extending of existing ‘green lines’ like the Statensingel.

12.2.3 Design alternative III: Boulevard Blijdorp

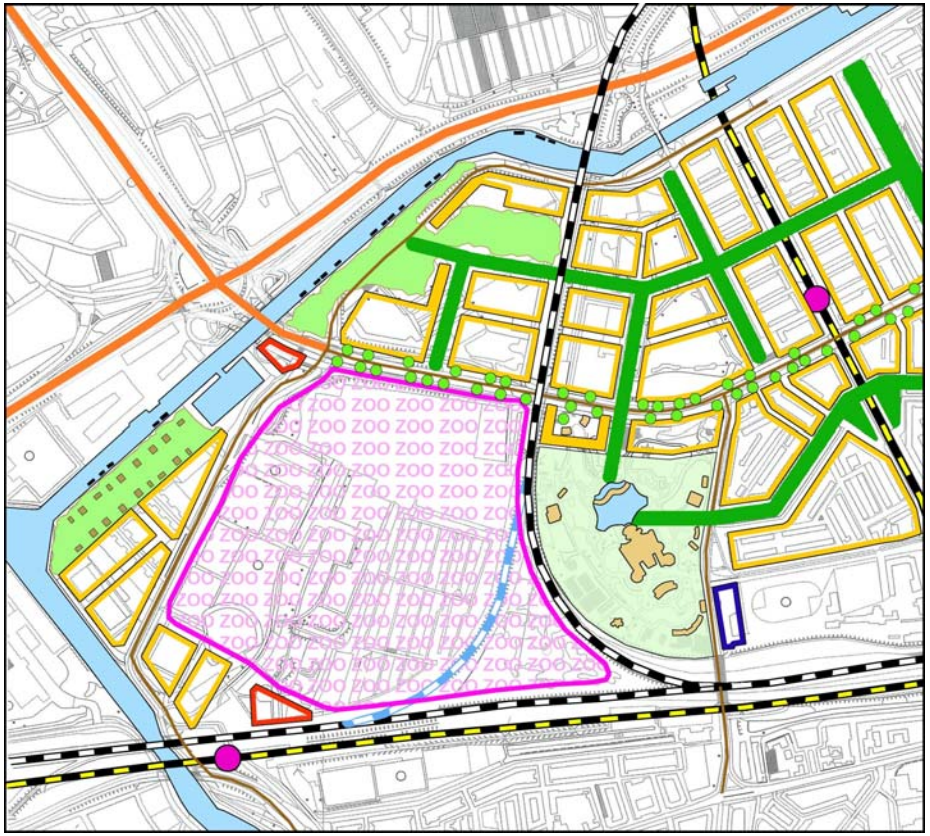


Fig. 63 | Concept map: combination of ‘urbanity’ and ‘boulevard’

In this design, the new buildings blocks, together with the downgraded A13 into the city, form the backbone of the plan. Like the title of this alternative: this will be a city boulevard with a broad profile. The new zoo is on 1 complete clover-leaf again, just like in alternative I. The allotment gardens move to the banks of the Schiekanaal, where they can profit of the water nearby, for cultivation reasons but also for recreational reasons.

12.2.4 Design alternative IV: Best of both worlds

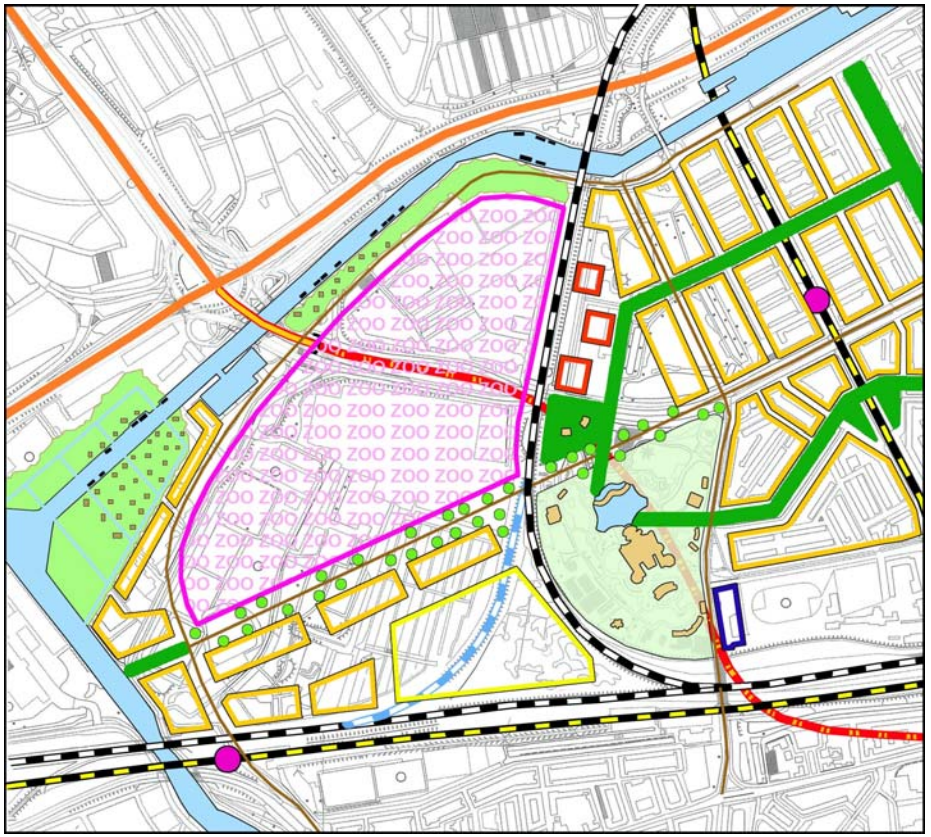


Fig. 64 | Concept map: combination of ‘urbanity’ and ‘tunnel’

The last alternative combines the benefits of a new Statentunnel with the advantages which an urban boulevard will give to the area. In this case, the boulevard is an extending of the Stadhoudersweg, but cuts completely through the south-western clover-leaf. Because of this, the zoo can be 1 undivided area again, and the new living area near the new light-rail station will be easy to reach by car. The allotment gardens will be a ‘small Venice on the Schiekanaal’, with broad ditches which parcels this area clearly.

13. Design scheme

The 4 design alternatives at the P3 can be seen as a study to discover the possibilities of the area. It also made clear which huge numbers of spatial elements play a role in the area. Realizing that, it became obvious that there was more 'organization' of the design process needed. This resulted in a so called 'design scheme' like fig. 65 shows.

In this scheme are brought together all spatial elements in the area which have some or huge importance. These elements are divided into 7 scale levels from high to low, but very much elements play a role on more than 1 scale level: they overlap. In broader outlines, these 7 scale levels can be reduced to 3 main levels: high, medium and low (also with overlap). So, think on 7 scales and bring it all together in maps on 3 scale levels is the idea of the design process.

Country (NL)	Highways (Diamond)	NS railroad	HST railroad		Blijdorp Zoo (position)						
Region (Z.-H.)	Highways (Diamond)	NS railroad	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Blijdorp Zoo (position)		Schie (transport)				
City (R'dam)	Highways (Diamond)	NS railroad	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Tunnel to city-centre	Industry/ Business activities	Schie (transport)				
Town district (Noord)	Green- / canal structure	Tram R'dam CS to Airport	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Tunnel to city-centre	City roads	Schie developing banks	Schie-kanaal (recreation)	Exit from highway or crossings motorway	Sports area	Allotment gardens
Clover and surround.	Green- / canal structure	Tram R'dam CS to Airport	Park (public area)	A13 turns into city-boulevard	Service & Commercial activities	City roads	Schie developing banks	Schie-kanaal (recreation)	urbanization: structures of built-up area	Sports area	Allotment gardens
Clover leafs together	Green- / canal structure	Underpass underneath railroad	Park (public area)	A13 turns into city-boulevard	Blijdorp Zoo (structure & organization)	Neighbour-hood roads			urbanization: structures of built-up area		
1 Clover leaf and smaller	Building blocks	Stations (public transport)	Monumental buildings & groundplan original zoo	Lay-out of public space	Blijdorp Zoo (structure & organization)	Neighbour-hood roads	Plural use of space/ surface				

HIGH

MEDIUM

LOW

Fig. 65 | Spatial elements in the design area on 7 scale levels, divided into 3 main scale levels

Determining the spatial elements which are important in this area is not enough; taking a closer look to the division into static elements (determined by government, municipality or other organisations) and dynamic elements (flexible to design) makes the design-task more clear. The scheme in fig. 66 shows this division into static and dynamic elements or a mix of those two. Summarizing: all grey elements become starting points for the design, and the green elements will adapt in a way that will work out as the best solution for this area. To conclude: mainly the medium and lower scale level are flexible to design, the highest scale is mainly decided yet.

Determined, static elements

Flexible, dynamic elements

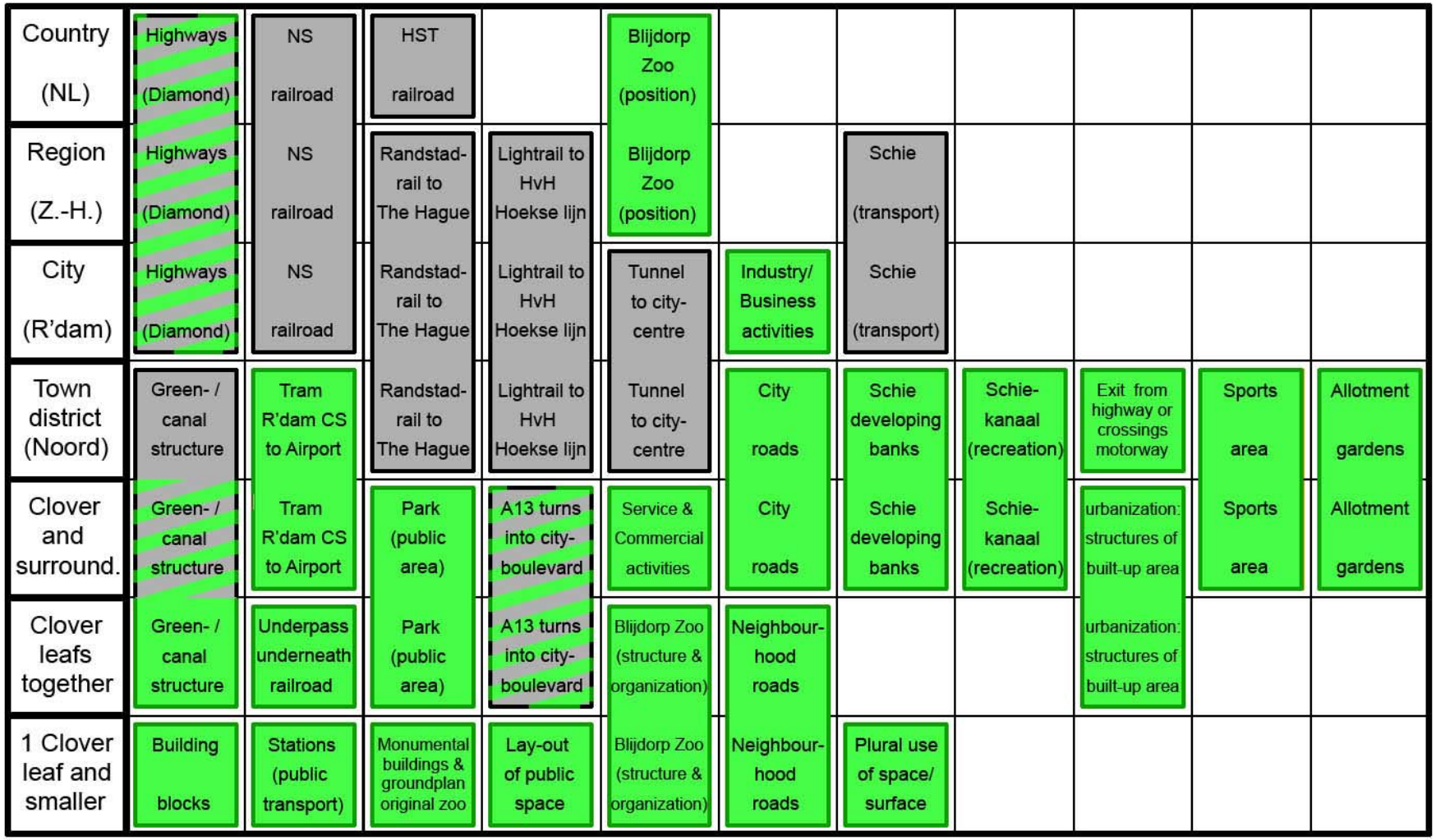


Fig. 66 | Static and dynamic elements

14. Design on highest scale level

Country (NL)	Highways (Diamond)	NS railroad	HST railroad		Blijdorp Zoo (position)						
Region (Z.-H.)	Highways (Diamond)	NS railroad	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Blijdorp Zoo (position)		Schie (transport)				
City (R'dam)	Highways (Diamond)	NS railroad	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Tunnel to city-centre	Industry/ Business activities	Schie (transport)				
Town district (Noord)	Green- / canal structure	Tram R'dam CS to Airport	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Tunnel to city-centre	City roads	Schie developing banks	Schie-kanaal (recreation)	Exit from highway or crossings motorway	Sports area	Allotment gardens
Clover and surround.	Green- / canal structure	Tram R'dam CS to Airport	Park (public area)	A13 turns into city-boulevard	Service & Commercial activities	City roads	Schie developing banks	Schie-kanaal (recreation)	urbanization: structures of built-up area	Sports area	Allotment gardens
Clover leafs together	Green- / canal structure	Underpass underneath railroad	Park (public area)	A13 turns into city-boulevard	Blijdorp Zoo (structure & organization)	Neighbour-hood roads			urbanization: structures of built-up area		
1 Clover leaf and smaller	Building blocks	Stations (public transport)	Monumental buildings & groundplan original zoo	Lay-out of public space	Blijdorp Zoo (structure & organization)	Neighbour-hood roads	Plural use of space/ surface				

Legend

- Highway (80 or 100 km/h)
- Downgraded highway into Provincial road (70 km/h)
- Downgraded highway into main urban road (50 km/h)
- NS railroad (public transport)
- HST railroad (freight transport)
- Lightrail (public transport)
- Train station (NS)
- Lightrail stations (existing)
- Lightrail stations (new)

Chapter 8 already mentioned the real plans concerning infrastructure on the high scale. In this stage the definitive decisions have been made about infrastructural interventions. These decisions are brought together in fig. 67.
Main change is the Statentunnel, which is not there anymore. Because of design decisions on the middle scale level (par. 15.1), namely 2 new exits from the A20 in the neighbourhood of the design area, a new tunnel turned out to be superfluous ánd expensive if it is not really needed.

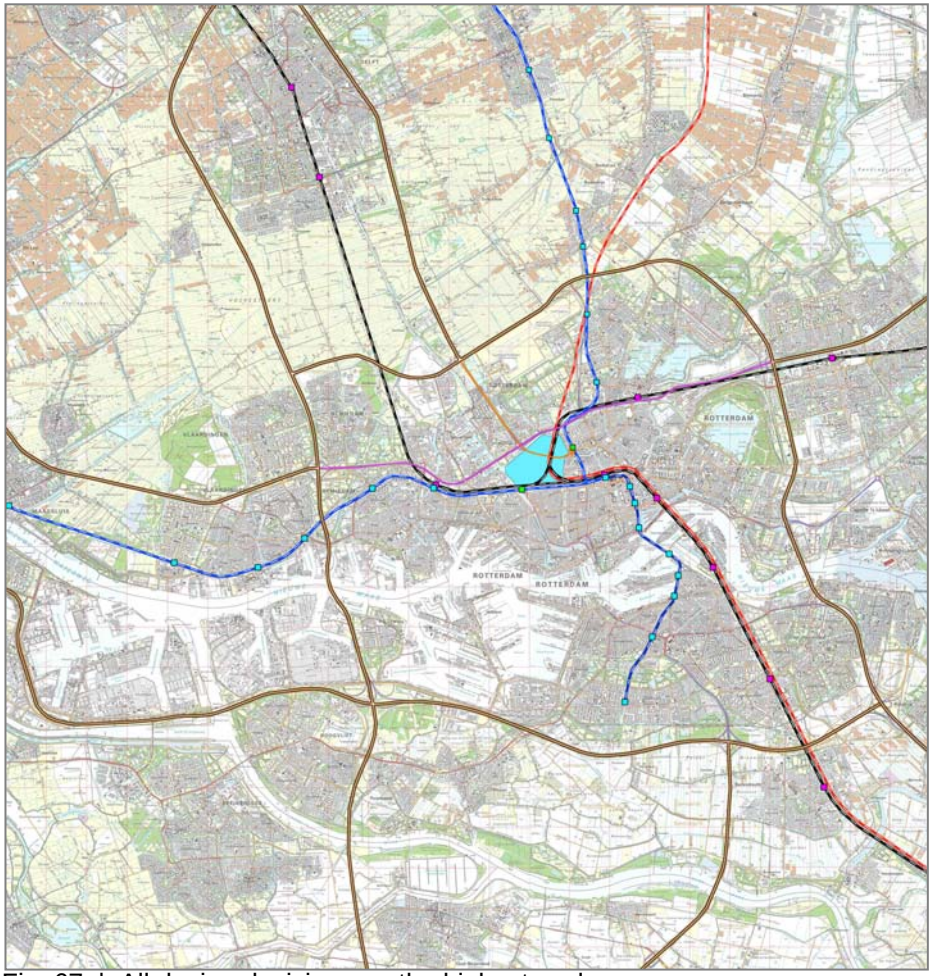


Fig. 67 | All design decisions on the highest scale

15. Design on middle scale level

Country (NL)	Highways (Diamond)	NS railroad	HST railroad		Blijdorp Zoo (position)						
Region (Z.-H.)	Highways (Diamond)	NS railroad	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Blijdorp Zoo (position)		Schie (transport)				
City (R'dam)	Highways (Diamond)	NS railroad	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Tunnel to city-centre	Industry/ Business activities	Schie (transport)				
Town district (Noord)	Green- / canal structure	Tram R'dam CS to Airport	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Tunnel to city-centre	City roads	Schie developing banks	Schie-kanaal (recreation)	Exit from highway or crossings motorway	Sports area	Allotment gardens
Clover and surround.	Green- / canal structure	Tram R'dam CS to Airport	Park (public area)	A13 turns into city-boulevard	Service & Commercial activities	City roads	Schie developing banks	Schie-kanaal (recreation)	urbanization structures of built-up area	Sports area	Allotment gardens
Clover leafs together	Green- / canal structure	Underpass underneath railroad	Park (public area)	A13 turns into city-boulevard	Blijdorp Zoo (structure & organization)	Neighbour-hood roads			urbanization structures of built-up area		
1 Clover leaf and smaller	Building blocks	Stations (public transport)	Monumental buildings & groundplan original zoo	Lay-out of public space	Blijdorp Zoo (structure & organization)	Neighbour-hood roads	Plural use of space/ surface				

Fig. 68 | Highways (2009)

15.1 Main roads

Chapter 14 mentioned already the decision to make 2 new exits from The downgraded A20 into the design area. Before, there was 1 exit which cut the design area very rigid in 2 parts (fig. 68).
Fig 69 shows the new exits, which will be connected to existing north-south main roads. The big Kleinpolderplein will disappear; there will not be anymore the possibility to change roads at this point! (because of the larger Diamond of Rotterdam, which will get the through traffic-function in future)
The downgrading of the A13 into a city boulevard with a maximum speed of 50 km/hour is represented by a road with broad and attractive profile, dressed with plantation at both sides of the road.

Fig. 69 | 2 new exits from the A20 and city boulevard A13 (2020)

15.1.1 Infrastructural element I: City boulevard A13

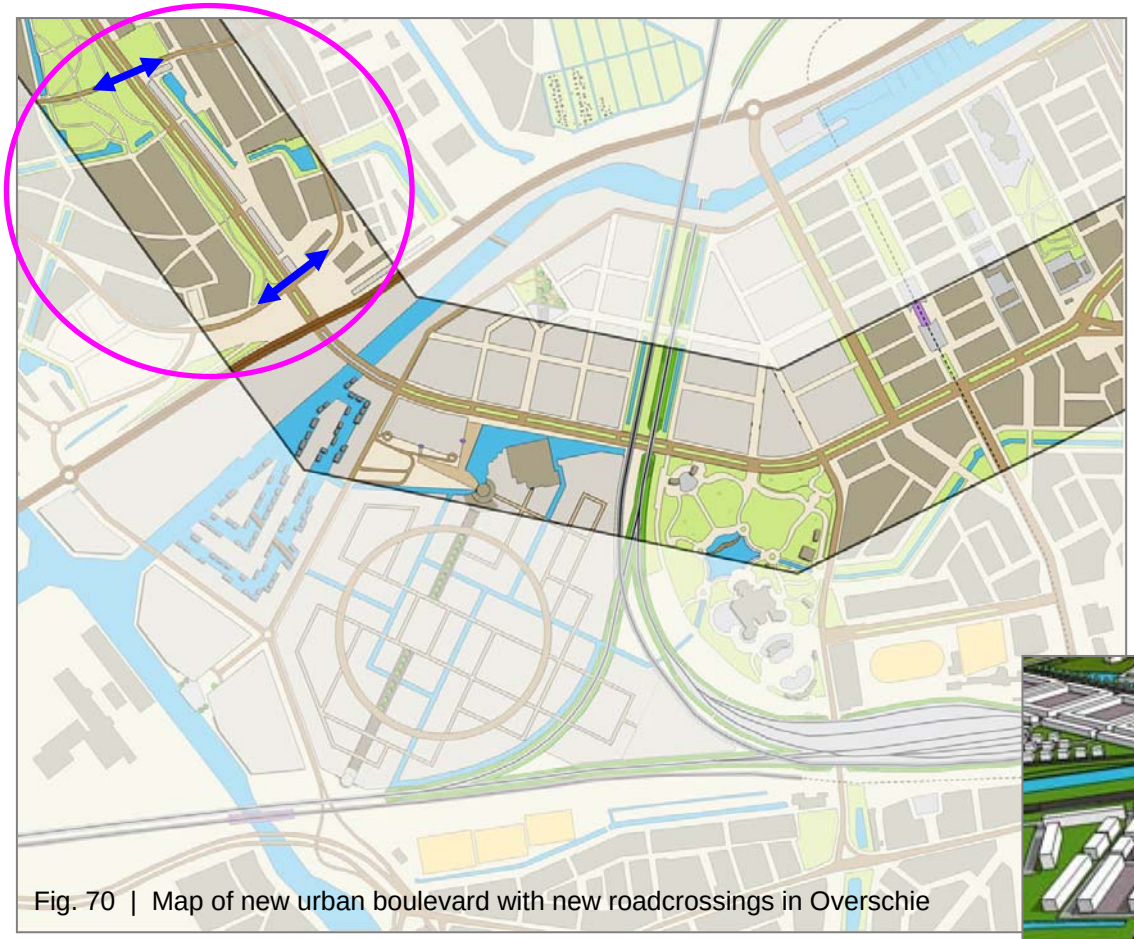


Fig. 70 | Map of new urban boulevard with new roadcrossings in Overschie

Fig. 71 | A13 (2009, Google Earth)

The downgrading of the A13 into a city boulevard has several advantages: The amount of driving lanes will be reduced from 4 in both directions to 2 in both directions. This reduction gives Overschie the possibility to add new buildings parallel to the boulevard on one side, and an extending of the existing park on the other side of the road (fig. 72).
There can also be created 2 crossings of the A13 with main roads in Overschie (fig 70). This makes Overschie much easier to enter.

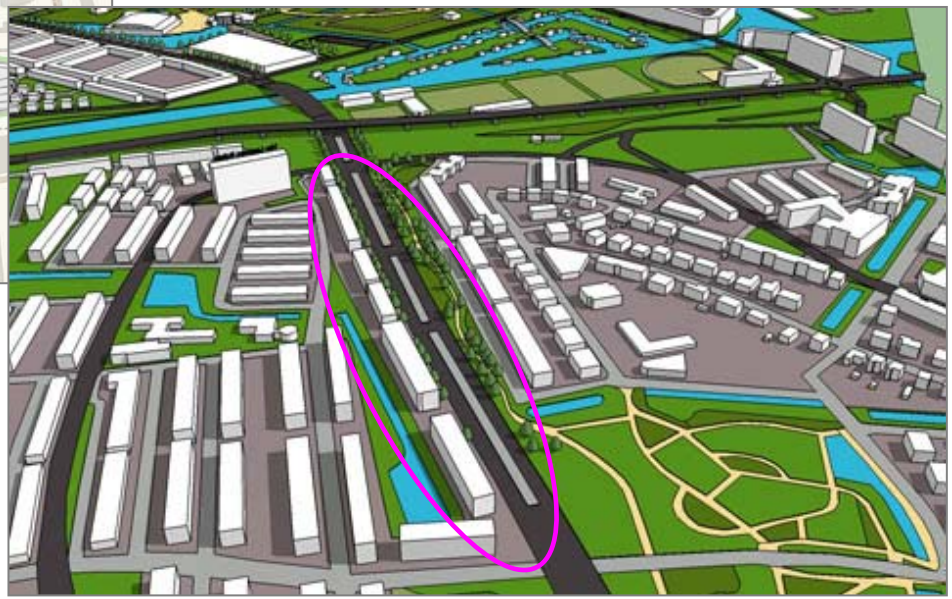


Fig. 72 | More space around the boulevard, thanks to the downgrading

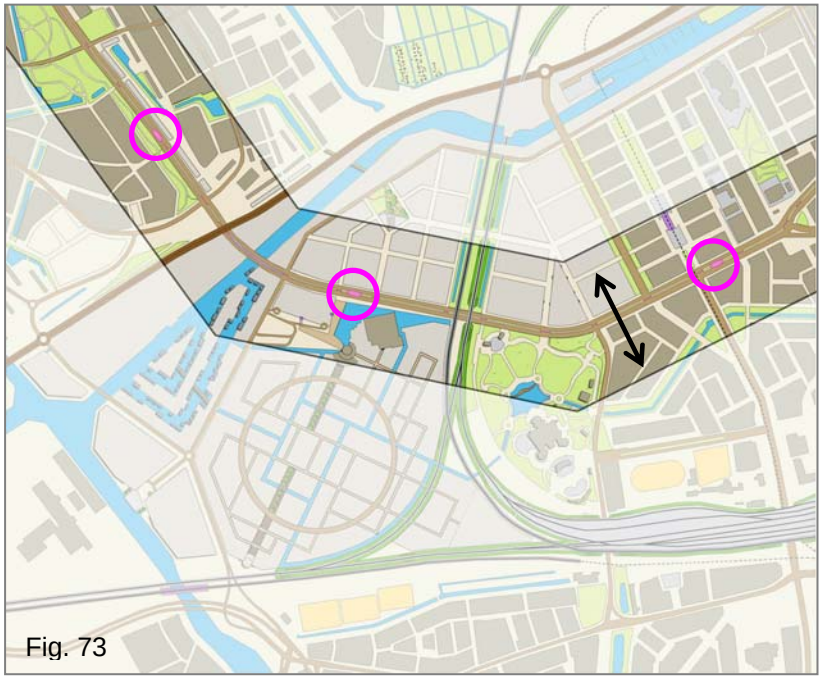


Fig. 73

An other benefit of the downgrading of the A13 is the possibility to introduce a tram-connection on the route between Rotterdam Central Station and Rotterdam Airport in the north.
The broad profile (36 meters) has enough space to get a central reserve (fig. 74 and 75), suitable for a 'Tram-plus' connection (3Hwww.ret.nl).

3 new tram stops are introduced on the Stadhoudersweg/downgraded A13 (fig 73.):

- At crossing with Statenweg (with possibility to switch to the light rail connection (Rotterdam CS-The Hague)
- At the entrance of the zoo
- At centre of Overschie

Fig. 73 | Map of city boulevard with 3 tram stops marked
Fig. 74 | 3D view on profile of future boulevard at marked location in fig. 73
Fig. 75 | Top view on profile of future boulevard

Fig. 74

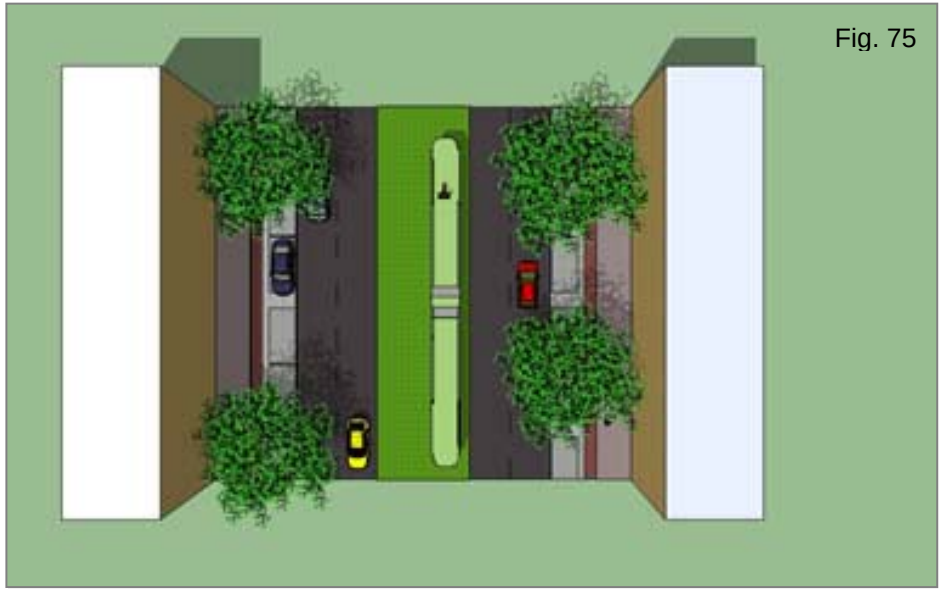


Fig. 75

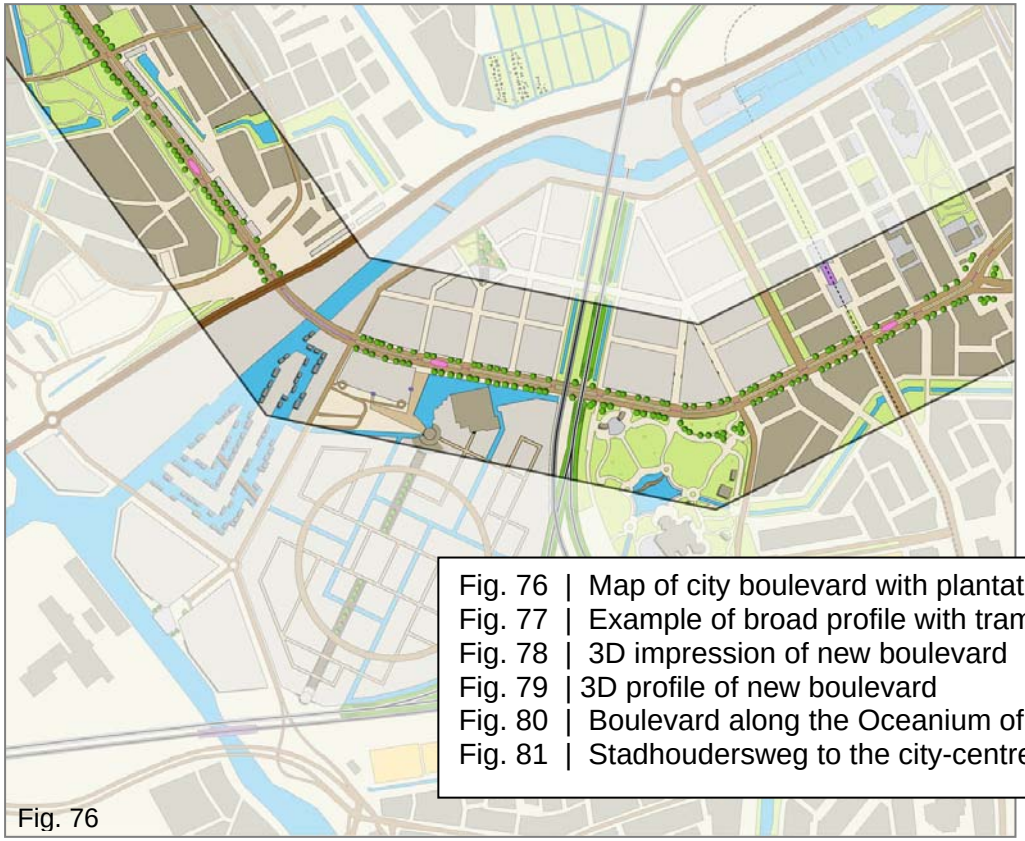


Fig. 76

The last element which makes the downgraded A13 a boulevard of full value, is the plantation. Trees along the road make it a real ‘lane’.


Fig. 77


Fig. 78

Fig. 76 | Map of city boulevard with plantation
Fig. 77 | Example of broad profile with tram and trees
Fig. 78 | 3D impression of new boulevard
Fig. 79 | 3D profile of new boulevard
Fig. 80 | Boulevard along the Oceanium of the zoo
Fig. 81 | Stadhoudersweg to the city-centre


Fig. 79

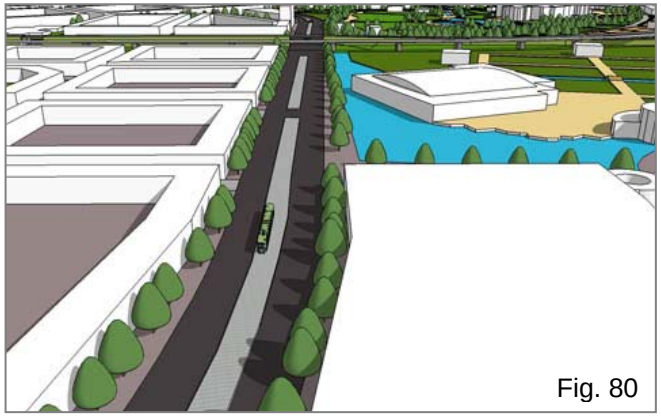


Fig. 80


Fig. 81

15.1.2 Infrastructural element II: a new exit from the A20

Fig. 82 | Location of the new exit

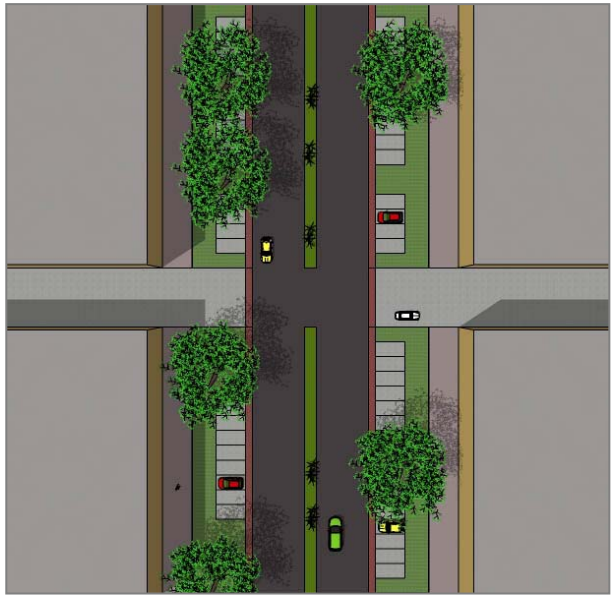


Fig. 83 | Top view of the new profile of the Vroesenlaan

Fig. 84 | Map of the connection between the A20 and the Stadhoudersweg

The second important infrastructural element is the new exit from the A20, which connects to the Vroesenlaan.
In reality, this road and bridge over the Schiekanaal is there, but it does not connect to the A20; instead of that, there is a viaduct over the A13 and the road goes on to sports facilities and the CBR.
In a spatial and technical way, this intervention is not a very big one, but it will have a lot of consequences for the flow of the traffic. This road will get used pretty heavy, so the profile of this road has to be very broad (40 meters) to maintain enough distance between the dwellings on both sides and the road. A broad strip of plantation and parking places will function as a visual buffer zone.

Fig. 85 | Vroesenlaan (2009)

Fig. 86 | Viaduct over A20 and bridge over Schiekanaal (2009)

Fig. 87 | 3D impression

Fig. 88 | 3D impression

Fig. 89 | Bird's-eye view on the new connection between A20 and Stadhoudersweg

Fig. 90 | Bird's-eye view on the new exit: it connects by the Stadhoudersweg to the existing north-south route 'Statenweg – 's Gravendijkwal.

Fig. 91 | Dwellings along the Vroesenlaan (2009)

Fig. 92 | Bridge over the Schiekanaal (2009)

15.2 Recreational route: blue & green

Fig. 93 | Current green structures in Rotterdam (2009)

Fig. 94 | New recreational route from the Kralingse Plas along the Schiekanaal

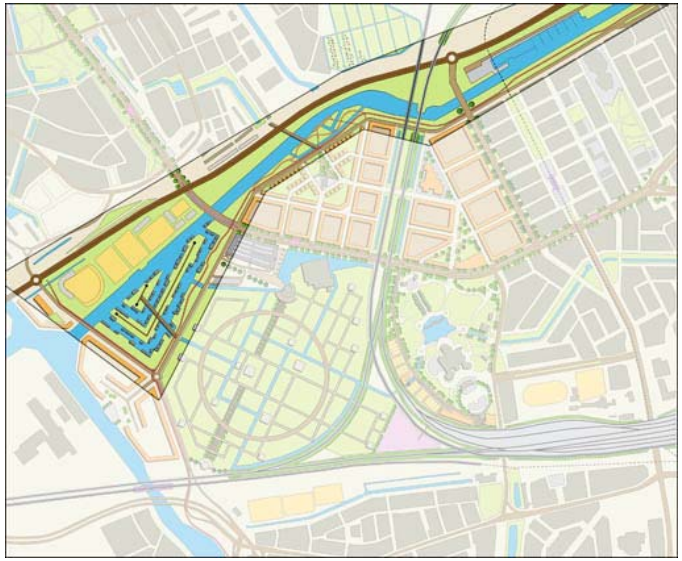


Fig. 95 | The new recreational zone

An other theme which is a design decision on the middle scale, is the new recreational route which will be introduced: on the moment, the water of the Schiekanaal is not being used very much, the banks are a little messy and therefore not very attractive, and last but not least: from the banks of the canal it is impossible to see the water because of the many houseboats that are situated over there. By making this route more attractive, it is necessary to move these houseboats (par. 16.3.3) and make the borders of the canal in general more attractive (par. 15.4 and 16.1.3) by creating sports activities and neighbourhood parks along it. Further to the north-east, there is already a little marina (fig. 95).

15.3 Living along the Schie

Fig. 96 | In the north: industry along the Schie and in the south: living area (2009)

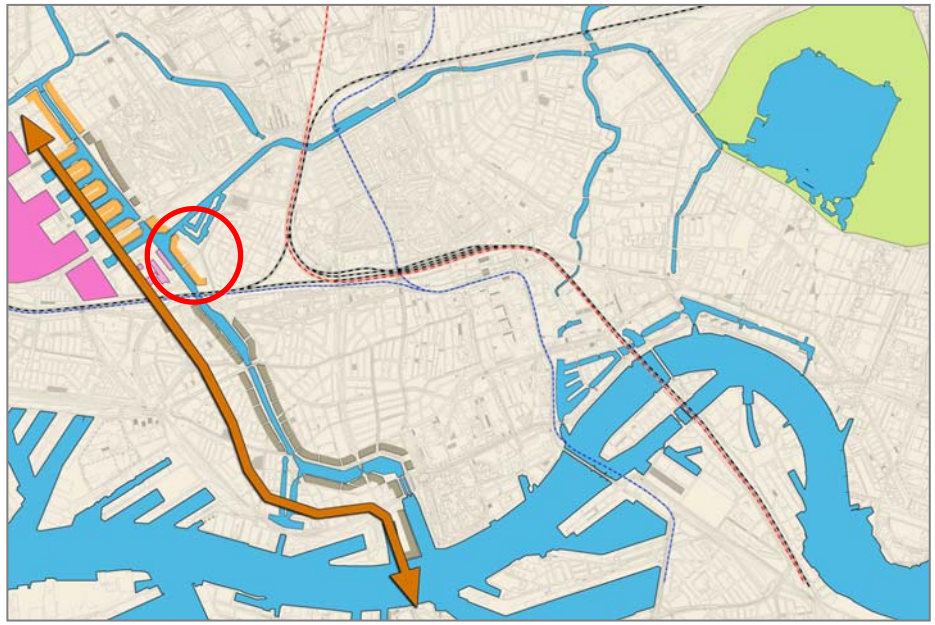


Fig. 97 | In the south ánd north: living area along the Schie, industry moved to the west (2020)

The Spaanse Polder is on this moment a location for light industry and other commercial activities (fig. 98). In future, the industry on the Westbanks of the Schie will move further to the west and create space for living areas (just like at the southern part of the Schie (fig. 99)).

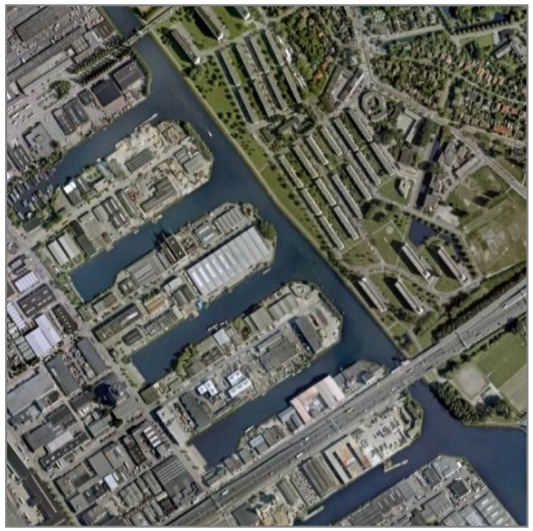


Fig. 98 | In the north: industry along the Schie (2009, Google Earth)

Fig. 99 | In the south: living area (2009, Google Earth)

This intervention also influences the design location, namely in the south-west corner (fig. 97). This area will also get a destination for housing (par. 16.3.2).

15.4 Sports facilities

Fig. 100 | Sports facilities completely spread around the whole area (2009)

Fig. 101 | Future sports facilities on 3 main locations (2020)

In the new design for the clover-leaf, the sports facilities will be more concentrated than on this moment. There will be 3 main locations for sports:

- In the Spaanse Polder, as a buffer zone between the new living area and existing industry;
- On the north-bank of the Schiekanaal as a part of the recreational zone;
- In the new urban park (par. 16.4)

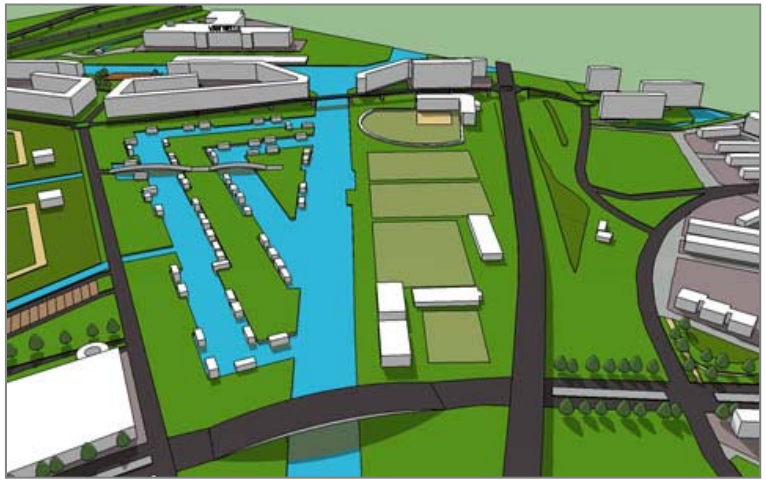


Fig. 102 | Sports area along the Schiekanaal: football & baseball

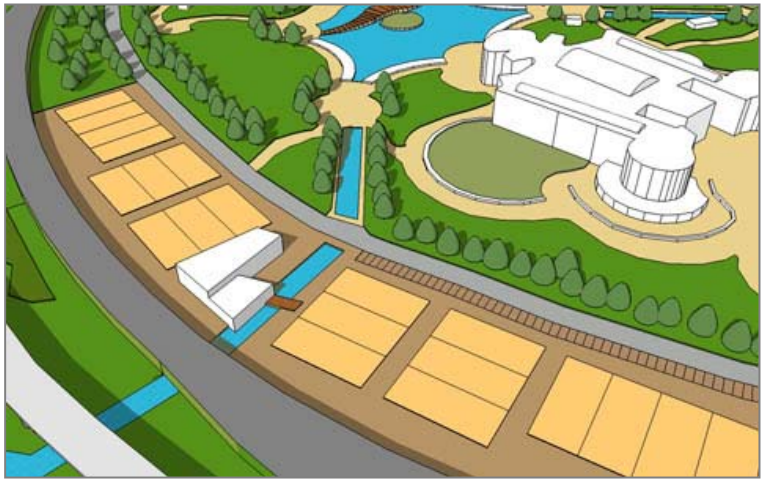


Fig. 103 | Tennis courts in the new urban park

15.5 General design concept about ‘green and red’: the zipper principle

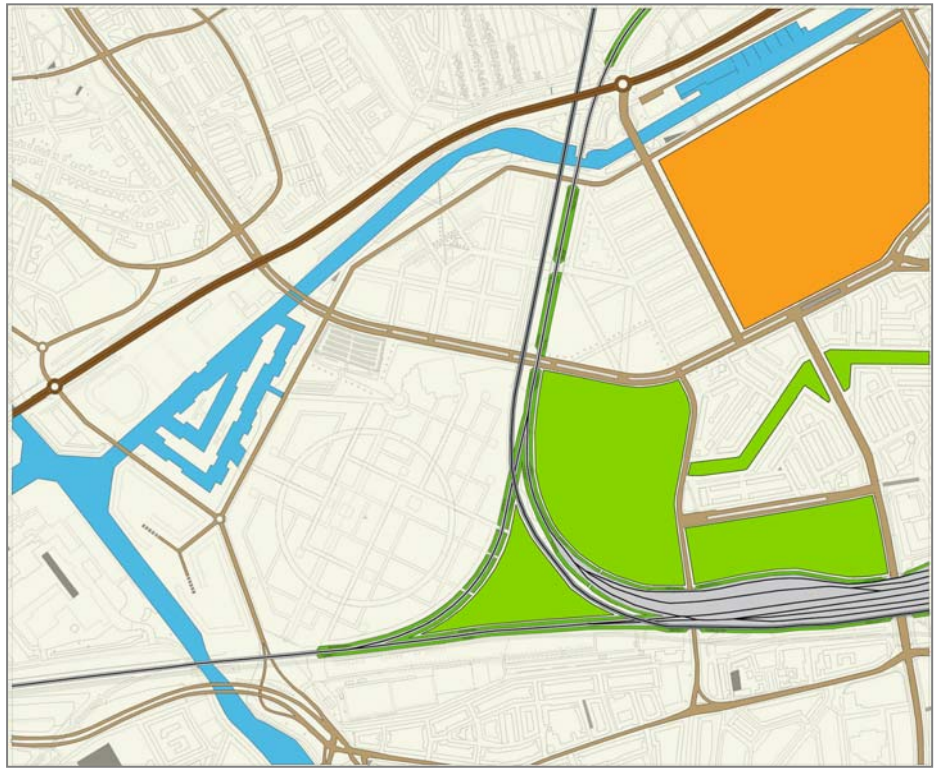


Fig. 104 | Starting point is the current situation in the clover-leaf

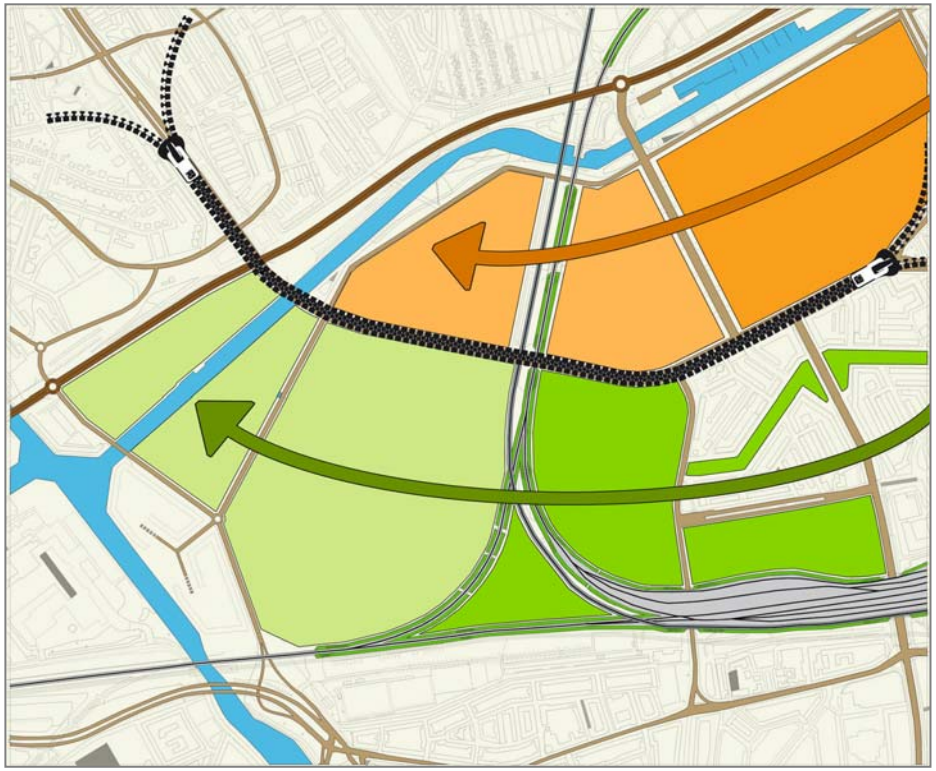


Fig. 105 | Extending existing structures of green and red

Nowadays, there are some areas which can be divided very clearly into 2 main characters: green areas and built-up areas (fig. 104).
The general concept for the clover-leaf is based on an extension of these characters (fig. 105) to the west side of the location.
The Stadhoudersweg (city boulevard A13) is the border of both characters and therefore has the function of a ‘zipper’, which ties both areas together.

16. Design on lowest scale level

Country (NL)	Highways (Diamond)	NS railroad	HST railroad		Blijdorp Zoo (position)						
Region (Z.-H.)	Highways (Diamond)	NS railroad	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Blijdorp Zoo (position)		Schie (transport)				
City (R'dam)	Highways (Diamond)	NS railroad	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Tunnel to city-centre	Industry/ Business activities	Schie (transport)				
Town district (Noord)	Green- / canal structure	Tram R'dam CS to Airport	Randstad-rail to The Hague	Lightrail to HvH Hoekse lijn	Tunnel to city-centre	City roads	Schie developing banks	Schie-kanaal (recreation)	Exit from highway or crossings motorway	Sports area	Allotment gardens
Clover and surround.	Green- / canal structure	Tram R'dam CS to Airport	Park (public area)	A13 turns into city-boulevard	Service & Commercial activities	City roads	Schie developing banks	Schie-kanaal (recreation)	urbanization structures of built-up area	Sports area	Allotment gardens
Clover leafs together	Green- / canal structure	Underpass underneath railroad	Park (public area)	A13 turns into city-boulevard	Blijdorp Zoo (structure & organization)	Neighbour-hood roads			urbanization structures of built-up area		
1 Clover leaf and smaller	Building blocks	Stations (public transport)	Monumental buildings & groundplan original zoo	Lay-out of public space	Blijdorp Zoo (structure & organization)	Neighbour-hood roads	Plural use of space/ surface				

To make all the different interventions on the lowest scale level clear, the clover-leaf is again divided into 4 parts (clover-leafs):

A Living area
B Living area
C Recreational area
D Park area

Figure 106, 107, 108 and 109 show the location of each part and the rest of this chapter explains the interventions one by one more detailed.

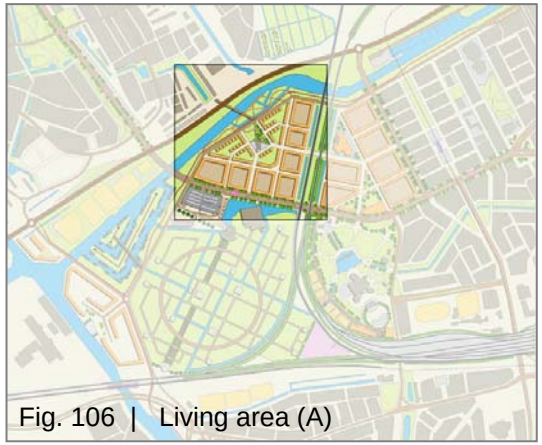


Fig. 106 | Living area (A)

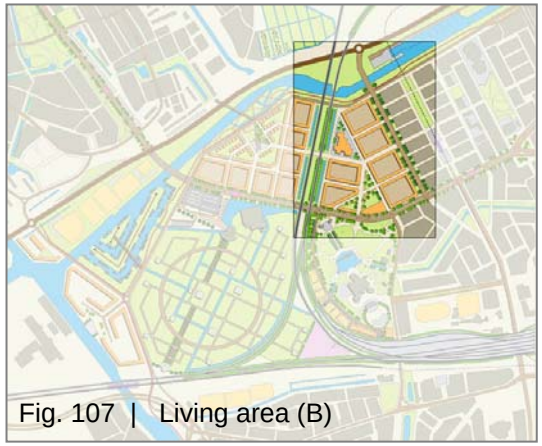


Fig. 107 | Living area (B)

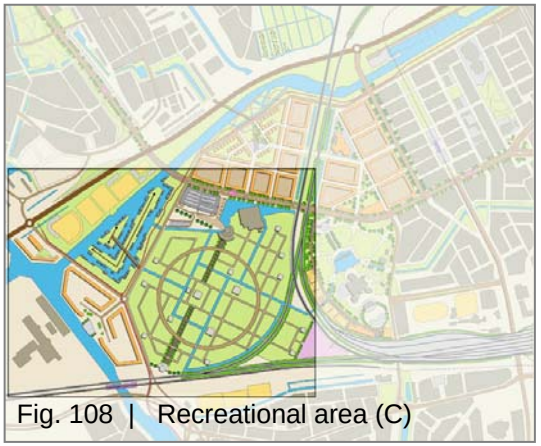


Fig. 108 | Recreational area (C)

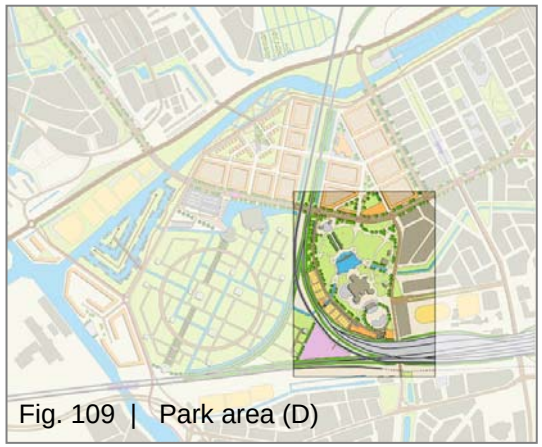


Fig. 109 | Park area (D)

16.1 Quadrant A: Living area

16.1.1 Design process and final result

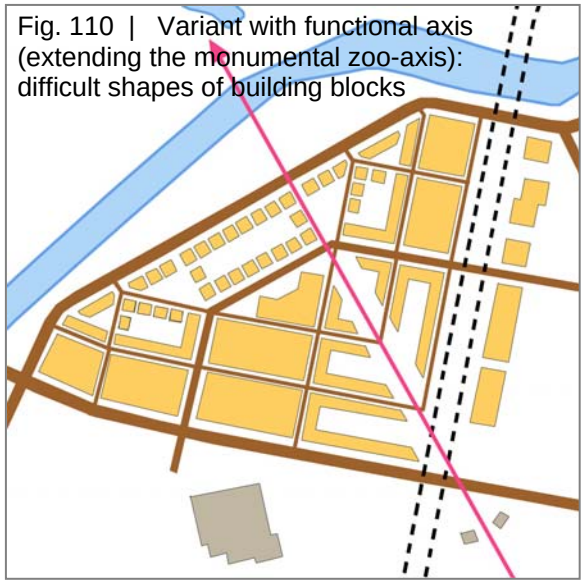


Fig. 110 | Variant with functional axis (extending the monumental zoo-axis): difficult shapes of building blocks

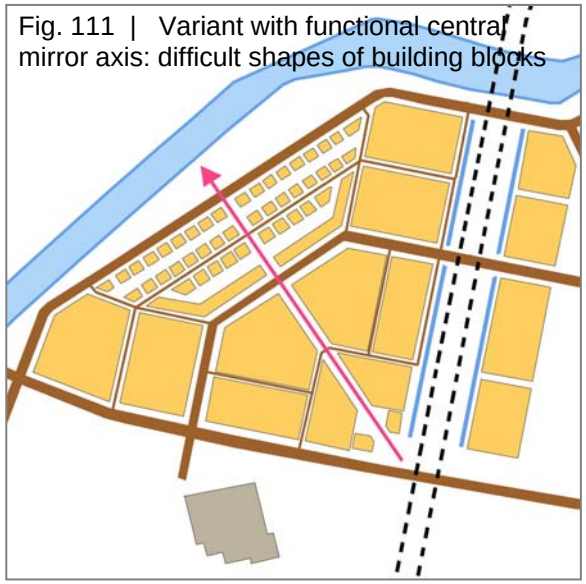


Fig. 111 | Variant with functional central mirror axis: difficult shapes of building blocks

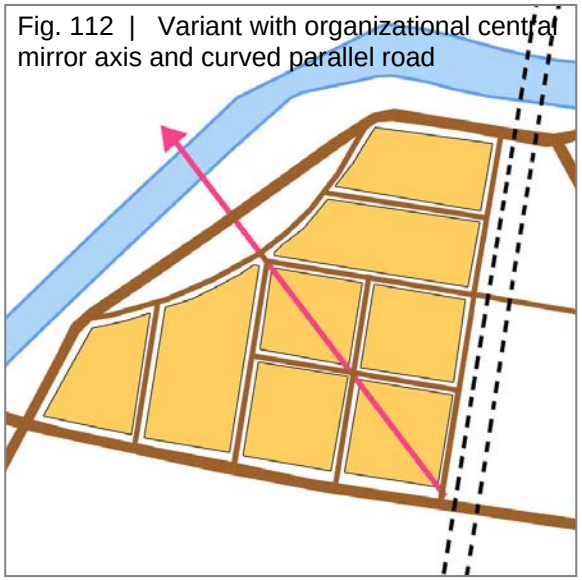


Fig. 112 | Variant with organizational central mirror axis and curved parallel road

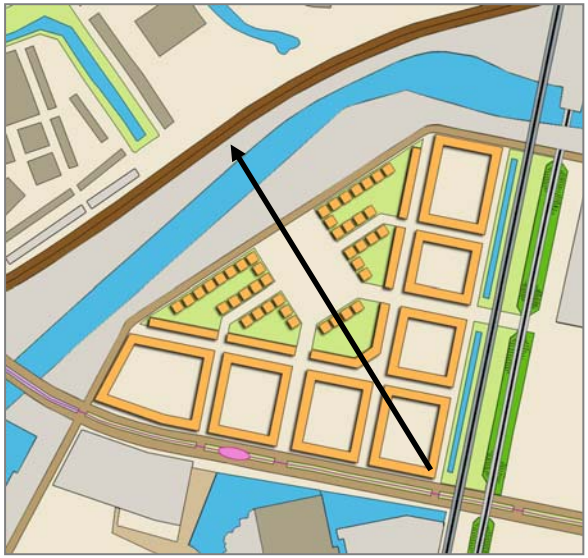


Fig. 113 | Final design with organizational symmetry axis

The design of this living area is based on the transition from an inner city density to a lower density along the Schiekanaal: gradually going ‘from city to nature’

Fig. 114 | Final design in bird’s-eye view

16.1.2 Spatial organisation of a building block

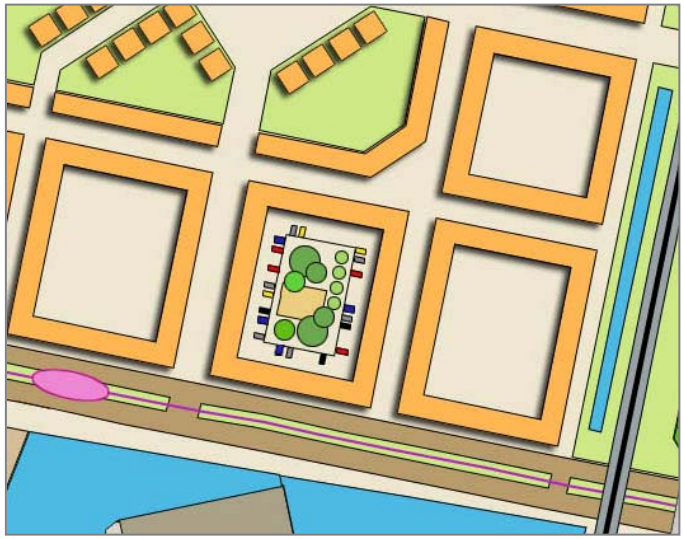


Fig. 115 | Ground floor of building block: parking space

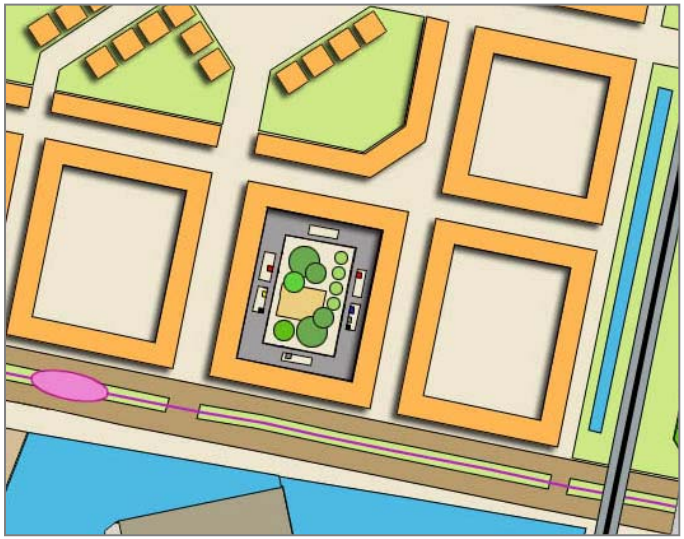


Fig. 116 | +1 level of building block: plank bridges

Fig. 119 | Parking and plank bridges in Den Bosch

Fig. 117 | 3D impression

Fig. 118 | 3D impression

The building blocks in this area are rather big: about 90 x 110 meters. Because of the lack of parking places in the existing living area of Blijdorp, the parking problem is solved ín the building blocks, by making a plank bridge on +1 level, from where people can enter their house. On the ground level there is enough parking space.

The reason for people to move out Blijdorp is often the rather small dwellings and the lack of safe space to play for children, so when the family grows with a child, they want to move out to a suburb. For this reason, the dwellings are big (100-150 m²) and inside the block there is room for kids to play and for vegetation.

Fig. 120 | Entrance (for cars) of a building block

Fig. 121 | Example of a building block

Fig. 122 | Example of a building block, Den Bosch

Fig. 123 | 3D impression of the living area, bird's-eye view from Overschie

Fig. 124 | Closed entrance to a building block, Helmond

16.1.3 Neighbourhood Park

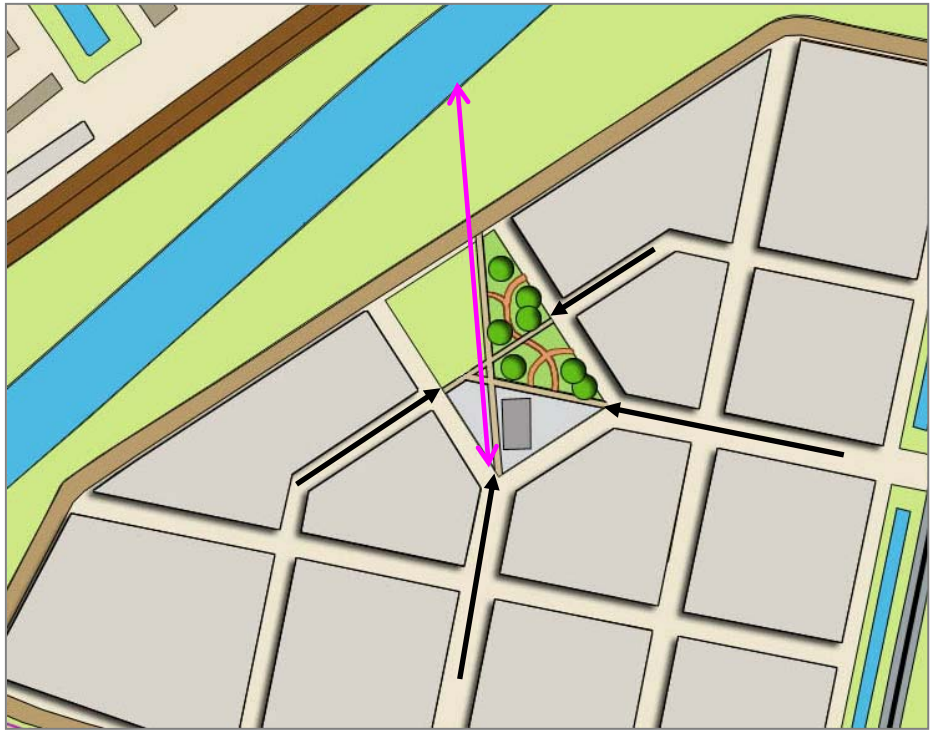


Fig. 125 | Map of neighbourhood park with logical routes

Fig. 126 | Neighbourhood park connected with the Schiekanaal by walking

Fig. 127 | Neighbourhood park, with basketballfield

Fig. 128 | Neighbourhood park, safe for children to play (4Hwww.denhaag.nl)

In the living area is a small neighbourhood park designed. This park is the transition zone from the urban area into the recreational strip of land along the Schiekanaal (par. 15.2).

Routes from the urban area are extended into the park (fig. 125) en from the park again extended to the Schiekanaal (fig. 126).

16.1.4 Recreational strip of land along the Schiekanaal

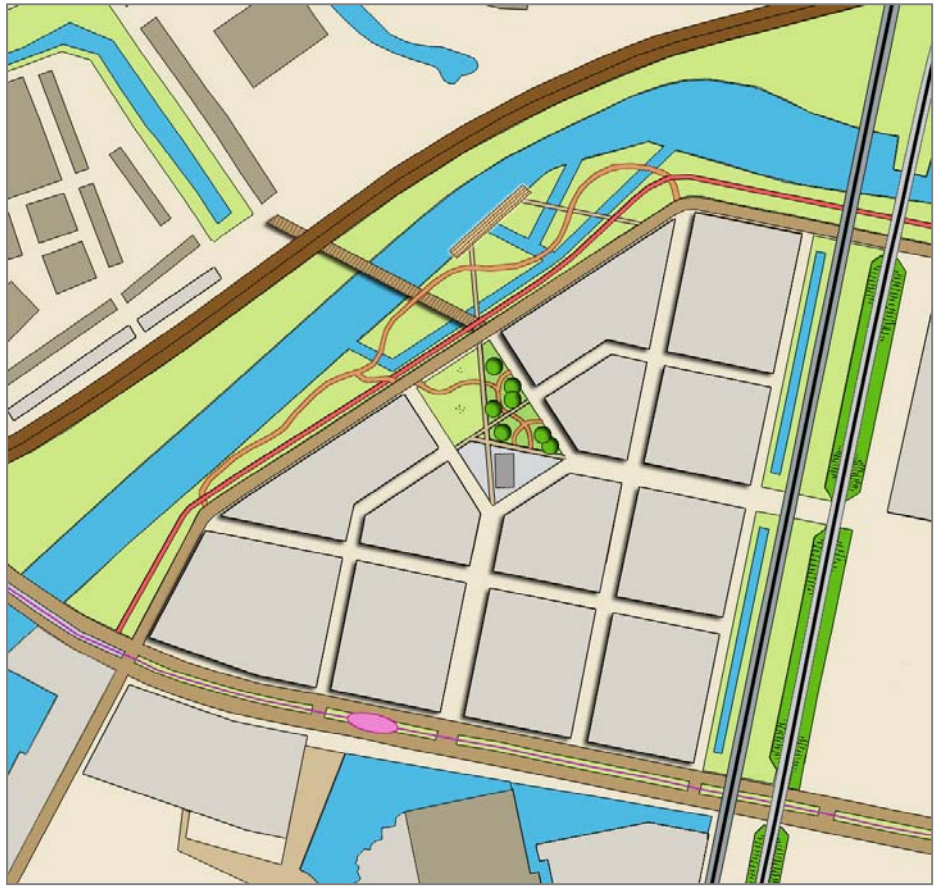


Fig. 129 | Map of neighbourhood park and recreational strip together

Fig. 130 | 3D impression

The smaller neighbourhood park leads by extended walking paths into the strip of land along the Schiekanaal, which is part of the complete recreational zone as mentioned in par. 15.2.

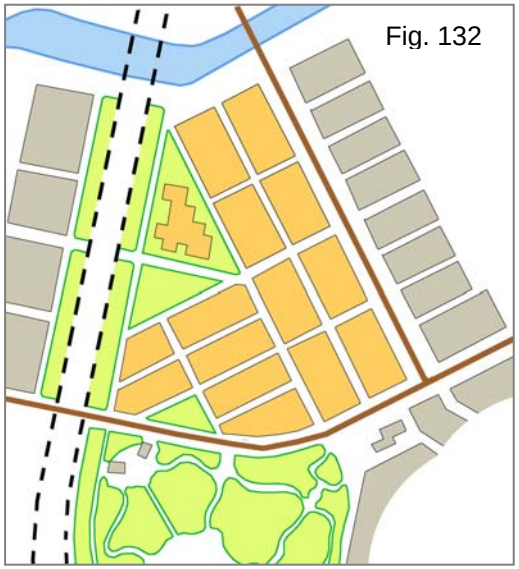
This area is designed to be a alternating landscape: water, vegetation, plank bridges, all together they form a natural landscape in which people can relax, discover with their children, walk with their dog, etc.

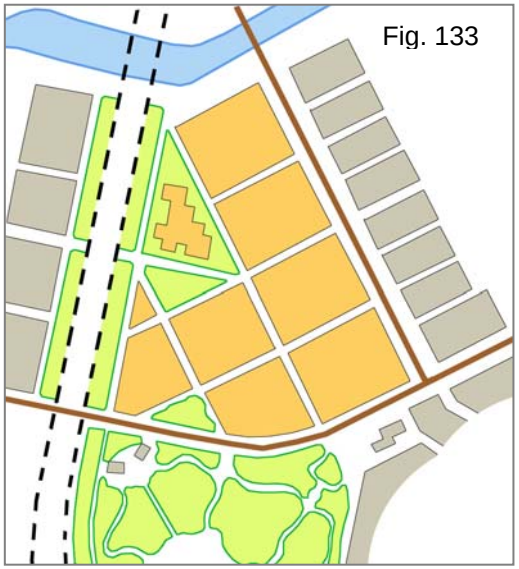
There is also a big bridge for bicycle- and pedestrian use; this bridge connects the green structures of Overschie with this area.

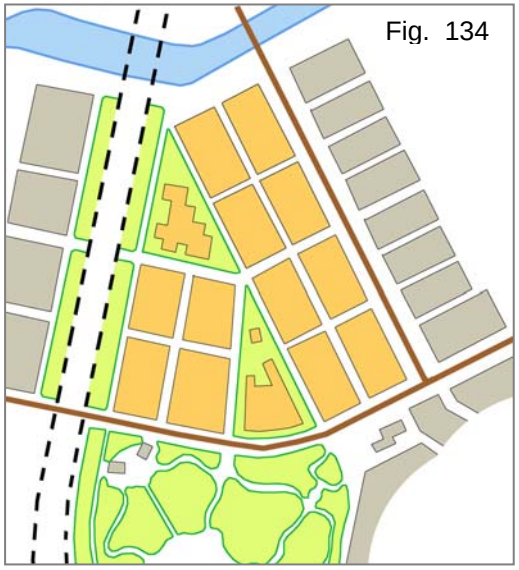
Fig. 131 | Examples of materialisation and spheres in the park

16.2 Quadrant B: Living area

16.2.1 Design process and final result







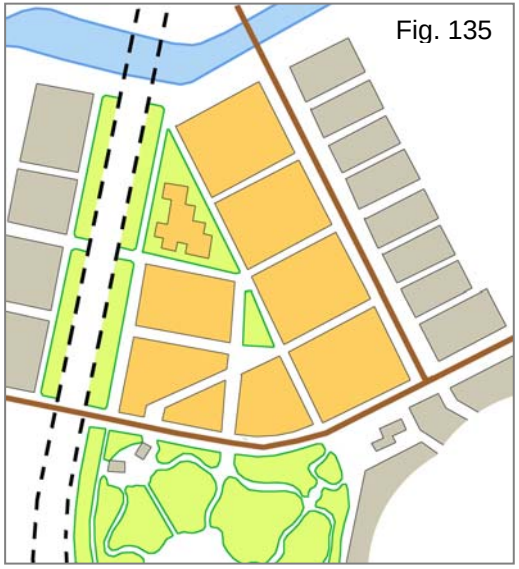


Fig. 132 | Variant with small building blocks
Fig. 133 | Variant with big building blocks
Fig. 134 | Variant with 2 triangles as rotation solution
Fig. 135 | Variant with 2 triangles and important oblique route through a building block

This living area is designed by trial and error: each variant has some positive and negative points; The final design is a combination of figure 134 and 135.
The triangles which are the solution for the rotation (of the location along the city boulevard), are still recognisable, but filled with 2 free standing buildings along the boulevard and a small green (flower)bed. This brings light and space between the huge building blocks of 4 floors.

Fig. 136 | Map of the final design for living area B

16.2.2 Explanation of design for living area

Fig. 137 | Connections from living area to public park

Fig. 138 | Triangle which solves the problem of the rotation along the city boulevard

Fig. 139 | 3D impression with logical routes from living area to park

Fig. 140 | Rectangles (building blocks) versus triangles ('koppelstuk')

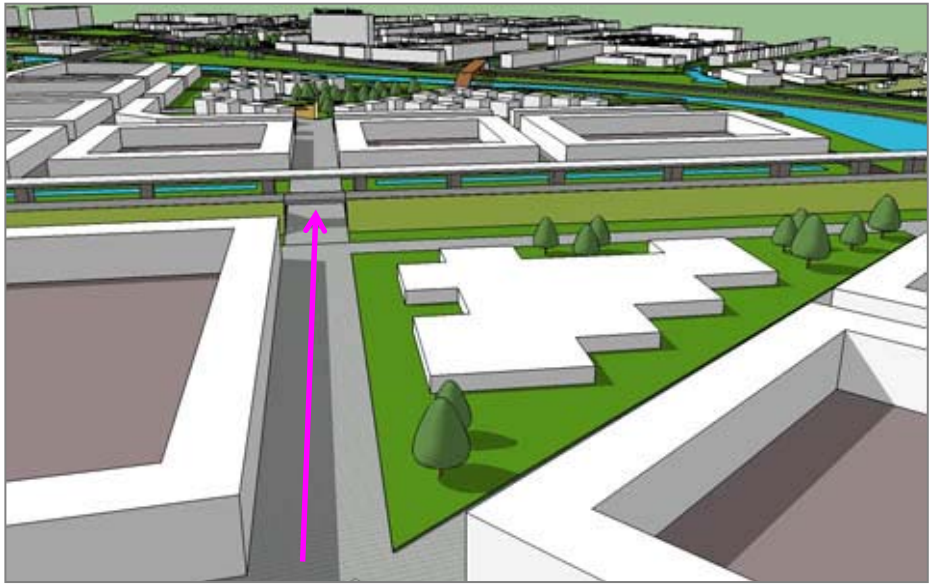
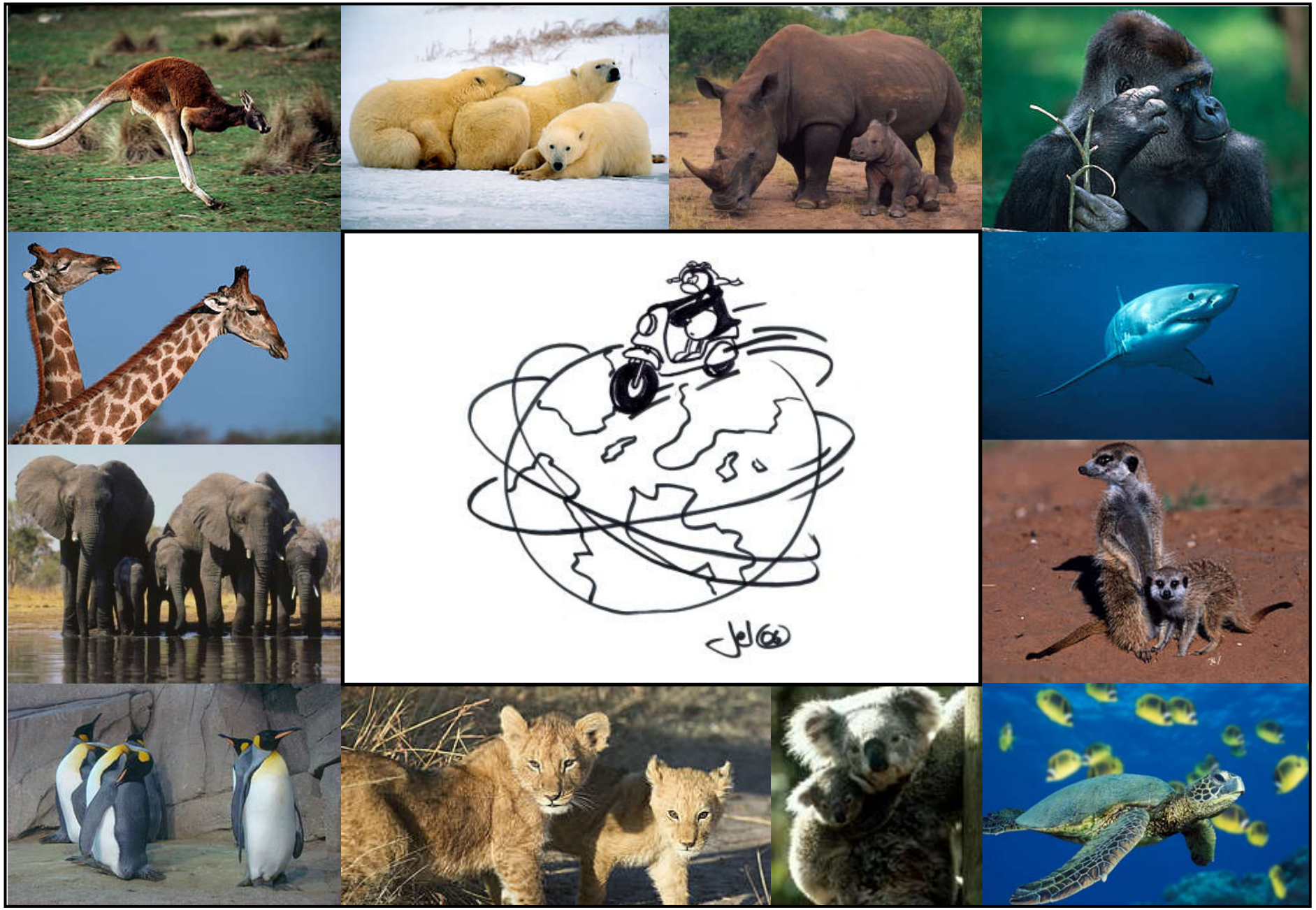


Fig. 141 | A new tunnel under the railroad has been created to improve the connection between quadrant A and B

Fig. 142 | Existing building typology and heights in Blijdorp are used also into the new living area

Fig. 143 | A ditch with natural banks between living area and railroad: Quality!

16.3 Quadrant C: Recreational corner



16.3.1 The new zoo

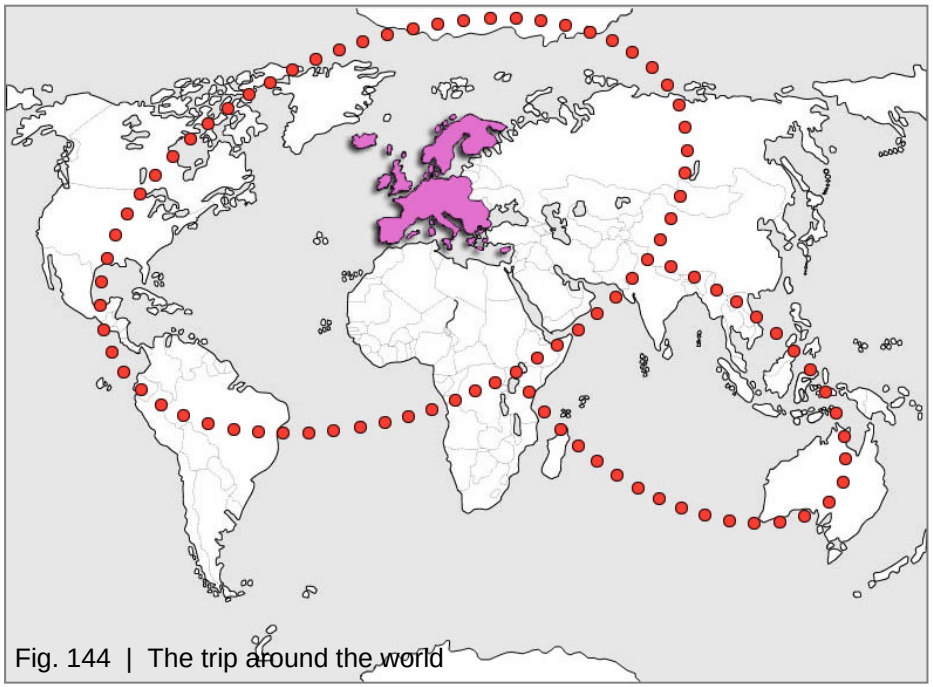


Fig. 144 | The trip around the world

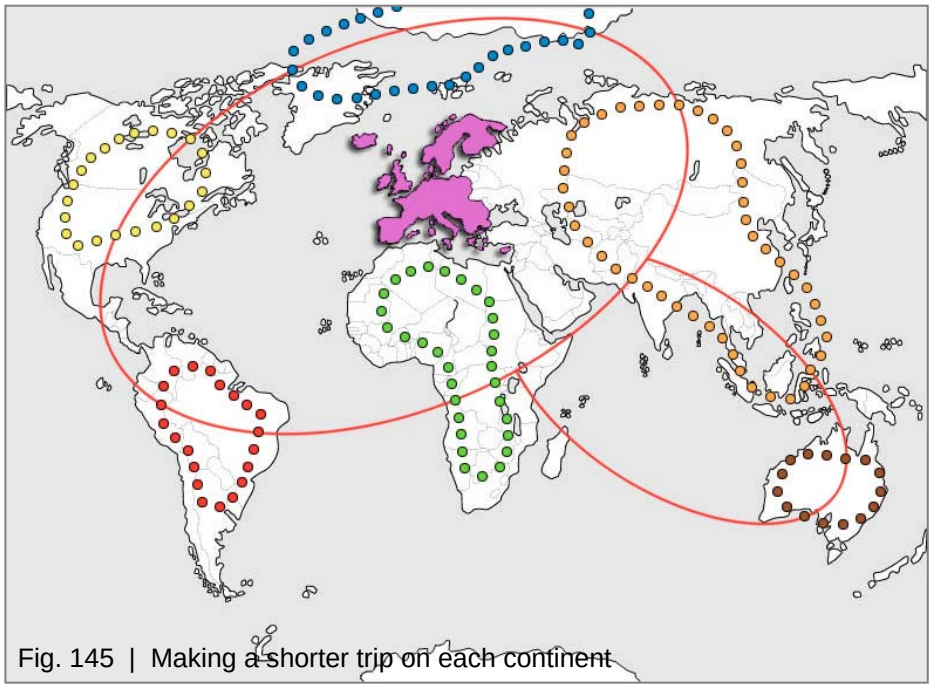


Fig. 145 | Making a shorter trip on each continent

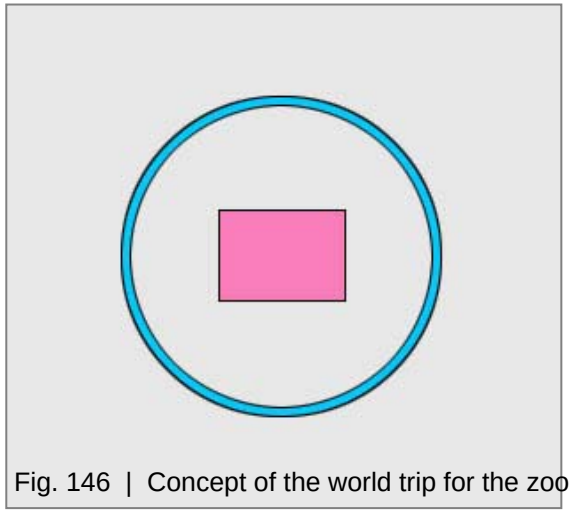


Fig. 146 | Concept of the world trip for the zoo

People who visit a zoo want to see a great variety of animals from all over the world. They are making some kind of 'trip around the world': get on a plane and travel along all the continents (fig. 144). In each continent, it is possible to make a shorter trip (fig. 145).

The new zoo is based on this principle: Europe is for us the centre of the world, so Europe will be in the middle of the zoo. The world trip goes around Europe (fig. 146). The smaller trips on the continents are all connected to the world trip (fig. 147).

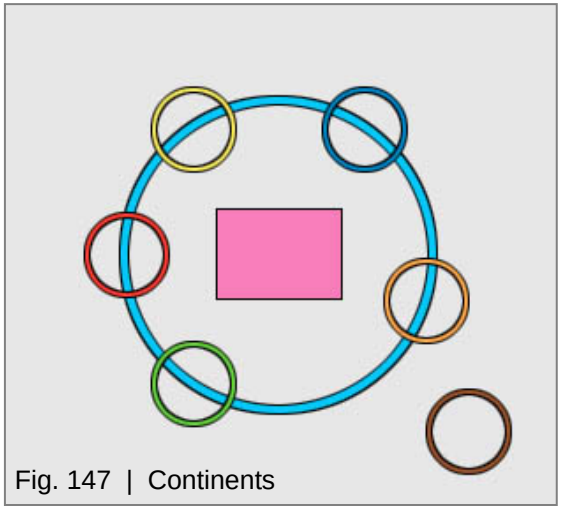


Fig. 147 | Continents

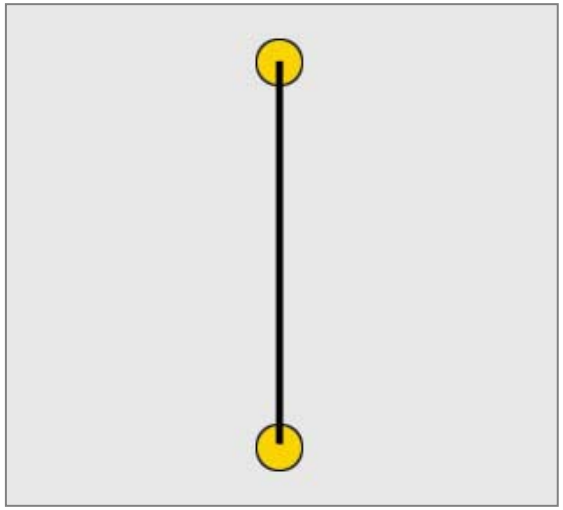


Fig. 148 | Other starting point: 1 central axis between both entrances of the zoo

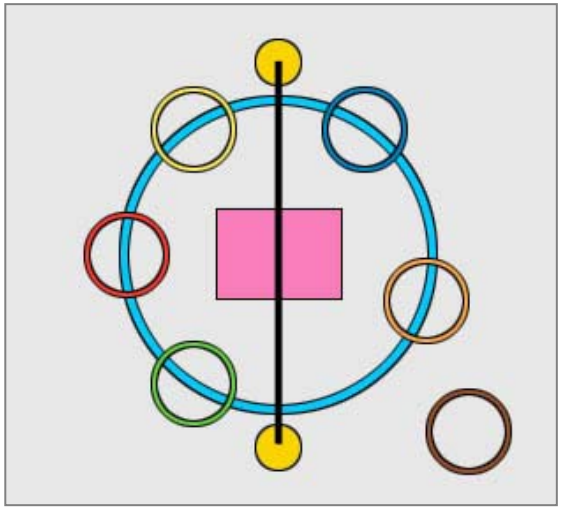


Fig. 149 | Complete concept for the new zoo

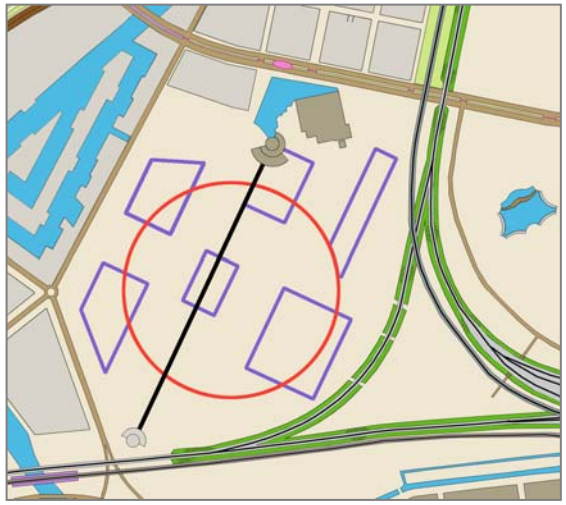


Fig. 150 | Concept projected on location

Fig. 151 | Situation in quadrant C (2009, Google Earth)

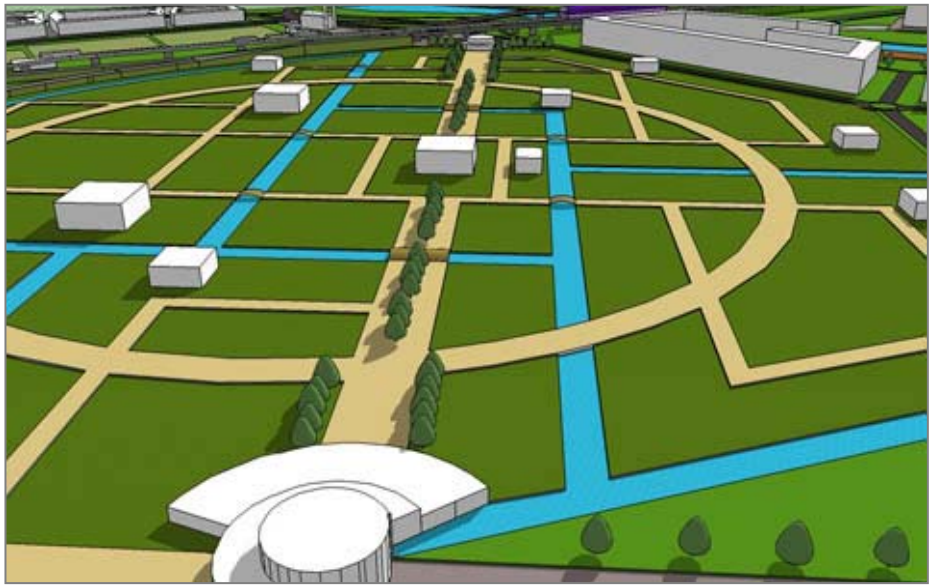


Fig. 152 | Main axis in the zoo between both entrances as a 'backbone' for the ground plan

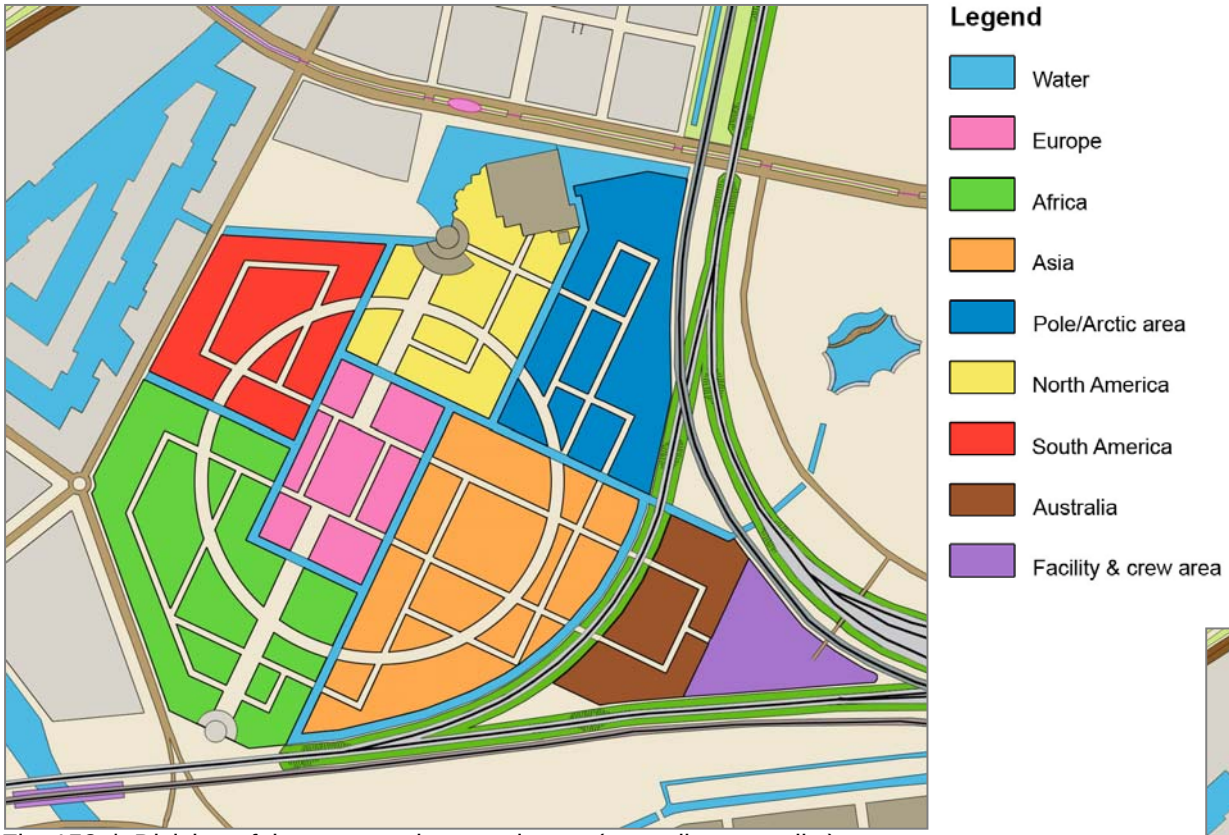


Fig. 153 | Division of the new zoo into continents (according to reality)

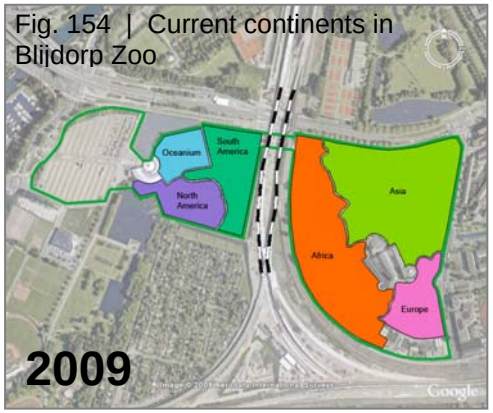


Fig. 154 | Current continents in Blijdorp Zoo

In the nowadays zoo is already a division into continents (fig. 154). In the new design for the zoo is the continent of Australia added.

The arrangement of the continents is more or less the same as we see it on the map of the world:
Africa on the south side of Europe,
Asia in the east, Australia far away from the rest of the continents: in the design the location of Australia (in the railroad triangle) emphasizes this expulsion.

Looking at the map of the world, there is water between almost all continents.
To emphasize this fact and to make the visitor conscious of the borders between 2 different continents, the water structure from the Statensingel is extended to the Schiekanaal through the zoo (fig. 153).

Figure 155 shows a more realistic map of the complete ground plan for the new zoo. Please note that through the use of different materials the transitions from main route to smaller routes can be made clear (or from main axis to the world trip). For example: the main axis is made of small bricks, the world trip is made of asphalt and the smaller trips on the continents are made of gravel.

Fig. 155 | Complete ground plan for the new zoo

Fig. 156 | Locations of buildings, determined by viewing lines from bridges over the water

Fig. 157 | Locations of buildings, determined by walking routes (viewing lines over land)

The zoo needs several buildings for multiple purposes, for example: housing for animals, restaurants for visitors, classrooms for education, a surgery room, office buildings, etc.

The locations of all these buildings are determined in 2 ways:

- At the end of viewing lines from bridges over the water;
- At the end of straight walking paths (viewing lines over land).

The maps show 14 buildings (and 2 entrance buildings); these are just examples of locations for buildings. So the amount of buildings and the size can still change, depending on what is exactly needed.

Fig. 158 | All viewing lines together, with 2 most special buildings

When all viewing lines are brought together in 1 map (fig. 158), it becomes obvious which buildings are more special than the rest. What does them make so special? The fact that some buildings have 2 viewing lines (as well over water as over land) instead of 1, makes such a building more visible than an other one.
There are 2 buildings with this result. These special buildings will become animal housing for the most popular animals in the zoo, like for example the giraffes or the elephants.

Fig. 159 | The new giraffe house in Blijdorp Zoo (2009). This is an example of a special building for the most popular animals (5Hwww.lam-

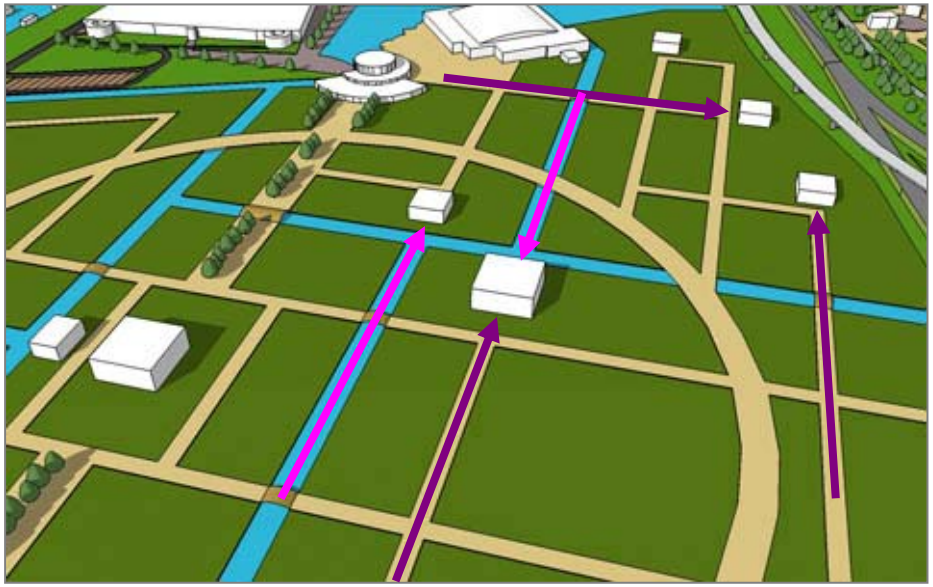


Fig. 160 | Locations of buildings, determined by viewing lines from bridges over the water (pink = view over water, purple = view over land)

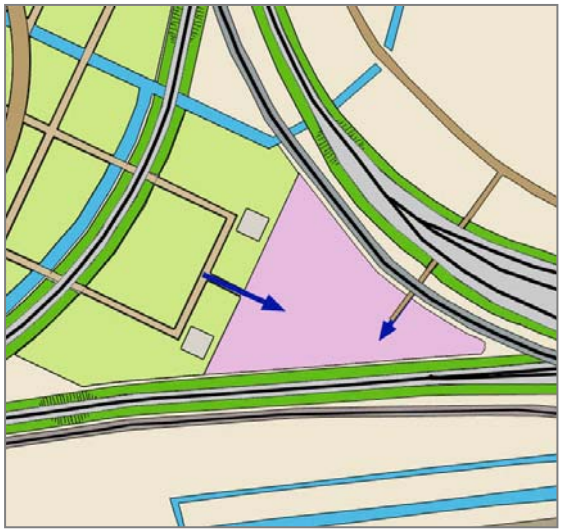


Fig. 161 | Map of crew area in the railroad triangle, reachable by 1 intern and 1 extern entrance.

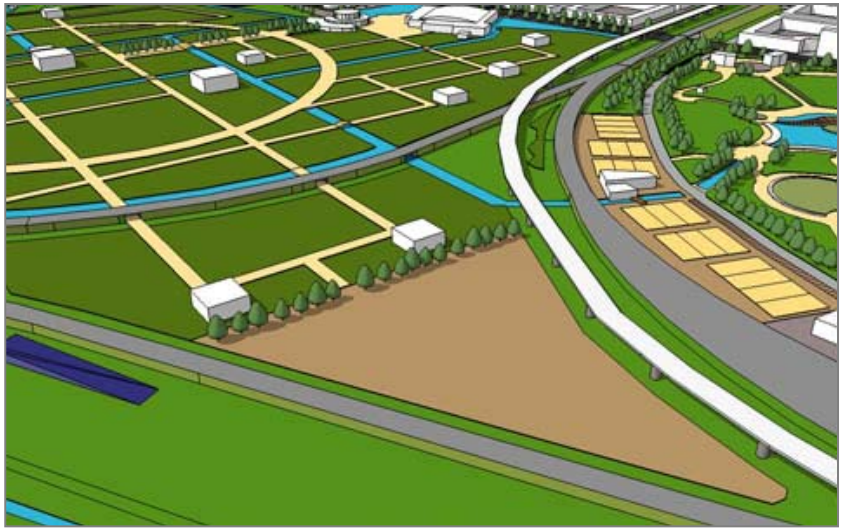


Fig. 162 | 3D view on the crew area

There are 2 areas which are ‘service’ locations in the zoo:

- The crew area in the railroad triangle: this surface is for the supply and storage of goods, garbage, quarantine space for new or sick animals, etc.

- The parking garage near to the main entrance of the zoo. Nowadays, parking places are on ground level and takes 3,2 ha (1450 places)! The new garage can store 550 cars on each floor; when it is 3 floors high, this results in 1650 parking places. Even 200 pieces more than now!

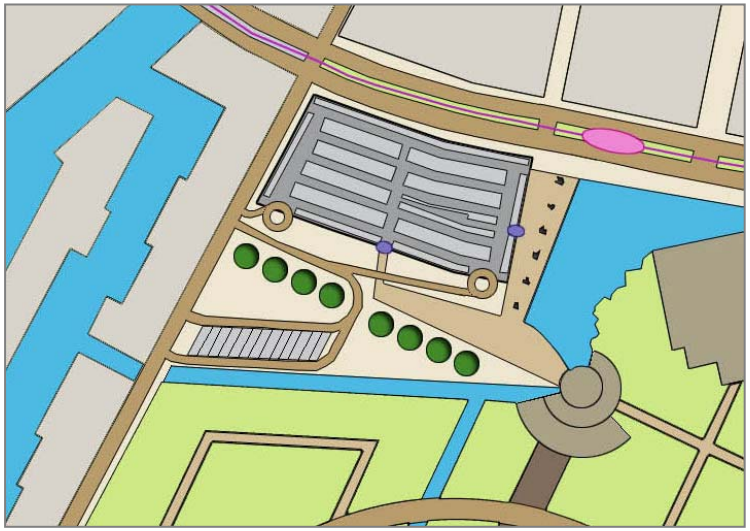


Fig. 163 | Map of the entrance area with the new parking garage for 1650 cars. Busses can park outside.

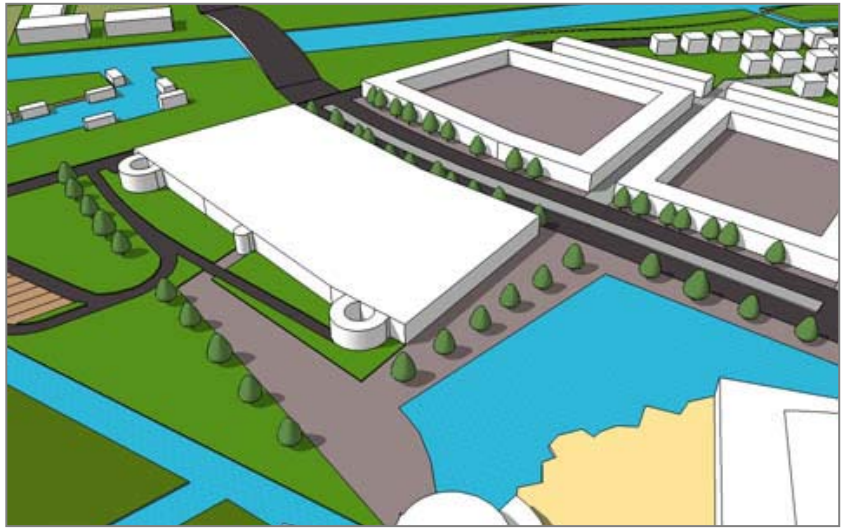


Fig. 164 | 3D view on parking garage. The size of this building matches with the size of the building block on the other side of the Stadhoudersweg.

Fig. 165 | Map of the plantation in the zoo.

There will be a lot of plantation in the zoo: for the scenery of animal houses or grazing fields, for the sake of beauty (like in the current situation the Chinese garden), etc.
These kinds of plantation are not determined, because that is not leading for the design on the scale of the complete zoo-area.
3 kinds of plantation are very well determined:
- Trees at the entrance area which lead the visitor to the entrance building, because the trees create a lane (fig. 167).
- Trees between the continent of Australia and the crew area in the railroad triangle, because the crew area has to be invisible to the visitors.
- Along the main axis in the zoo (fig. 166).

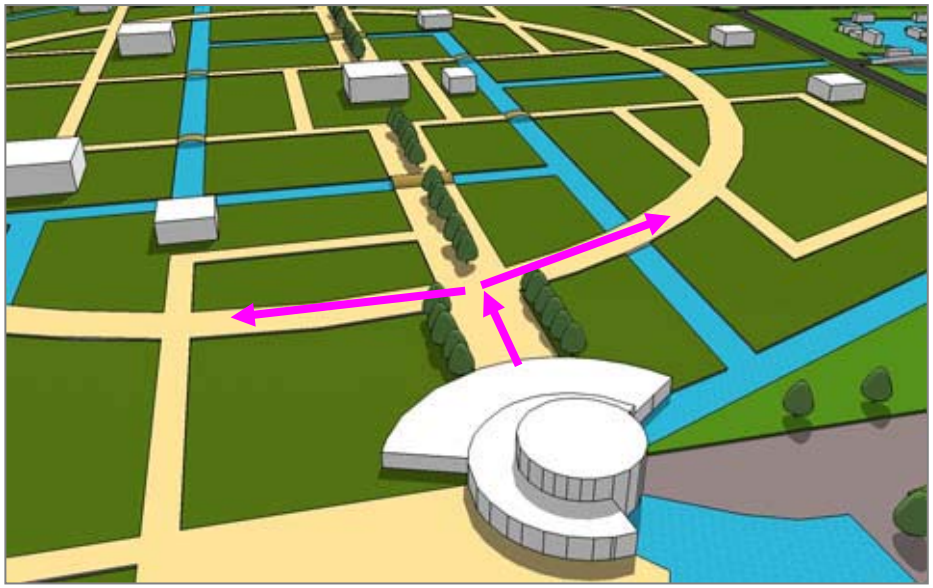


Fig. 166 | Plantation on the main axis in the zoo: when the main axis crosses the circular route, the trees are not longer on both sides of the axis but in the middle of it. This makes the visitor conscious of the concept of the ground plan.

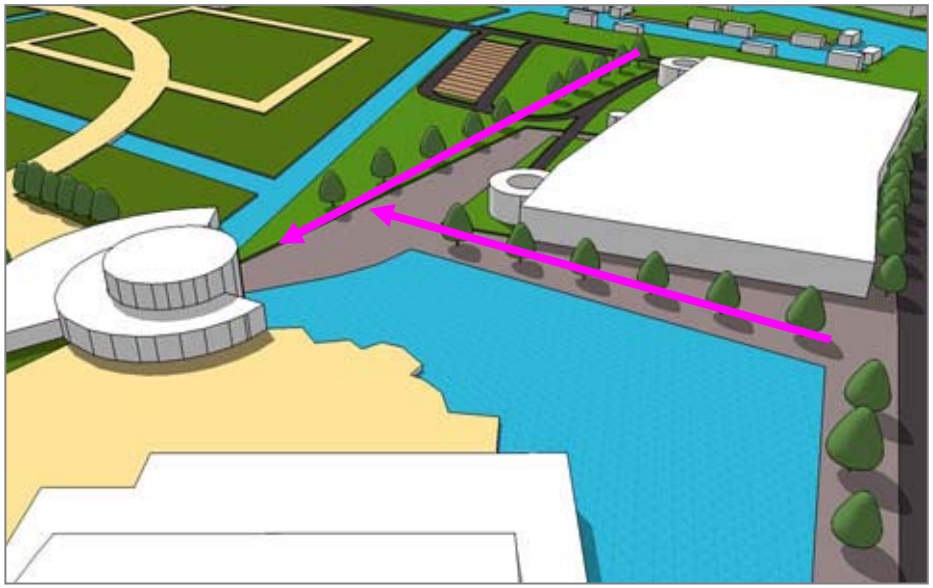


Fig. 167 | Plantation at the entrance area of the zoo

Continents	Old situation	New design	Growth in %*
Europe	2,1	3,1	**148%**
Africa	6,9	8,1	**117%**
Asia	6,8	7,9	**116%**
North-America	1,9	4,5	**237%**
South-America	3,0	4,2	**140%**
Oceanium/Pole area	1,3	5,4	**415%**
Australia		2,4	**n.v.t.**
subtotal	22,0	35,6	**162%**
Overig			
Facility area	1,4	1,6	**114%**
Parking area	3,2	1,3	**41%**
Entrance area	0,9	2,5	**278%**
Water	0,6	2,9	**483%**
subtotal	6,1	8,3	**136%**
Total surface (ha)	28,1	43,9	**156%**

* in comparison with old situation

Fig. 168 | Scheme of comparison in surface between the old and the new zoo

Fig. 169 | 3D view of the division of continents in the zoo

The change of the location of Blijdorp Zoo brings several benefits. The spatial problems which where explained in the thesis plan are solved by this new design. Furthermore, the zoo gets the possibility to grow; before, the zoo was completely embraced by other functions and had not any prospect to grow.

To get more grip on this growth, figure 168 shows the amount of surface for each continent in the old and new situation. Also the surfaces of the service areas has been count: facility (crew) area, parking area, entrance area and the surface of water.

Conclusion of this scheme is: The growth of the complete zoo is 56% compared to the original surface. The surface for animals is enlarged with 62% and the service area with 36%.

Note that only the surface for parking purposes is reduced very much, which is a positive result!

16.3.2 Mega blocks along the Schie

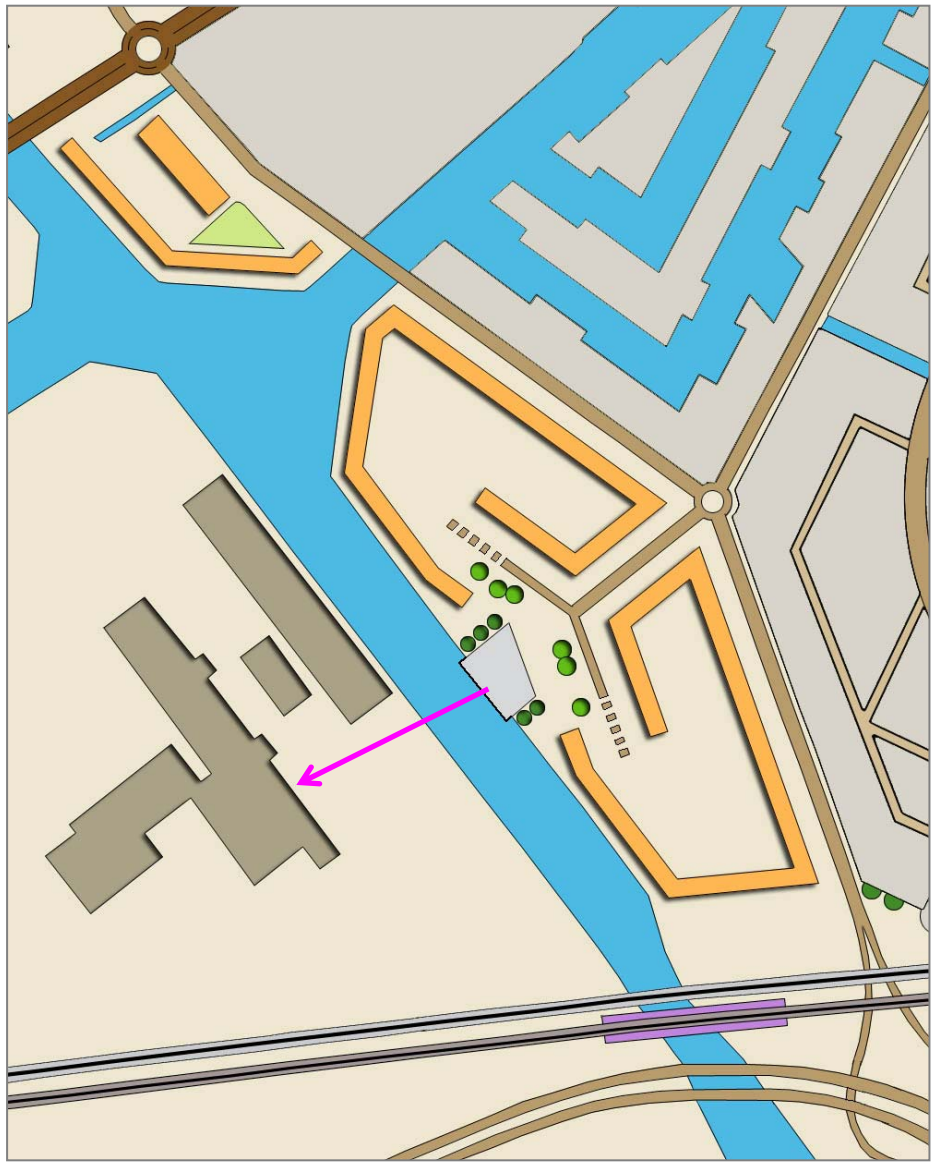


Fig. 170 | Map of megablocks with a platform which gives a spectacular view on the van Nelle Factory.

Fig. 171 | the Whale in Amsterdam: an example of a mega block with attitude

Fig. 172 | van Nelle Factory

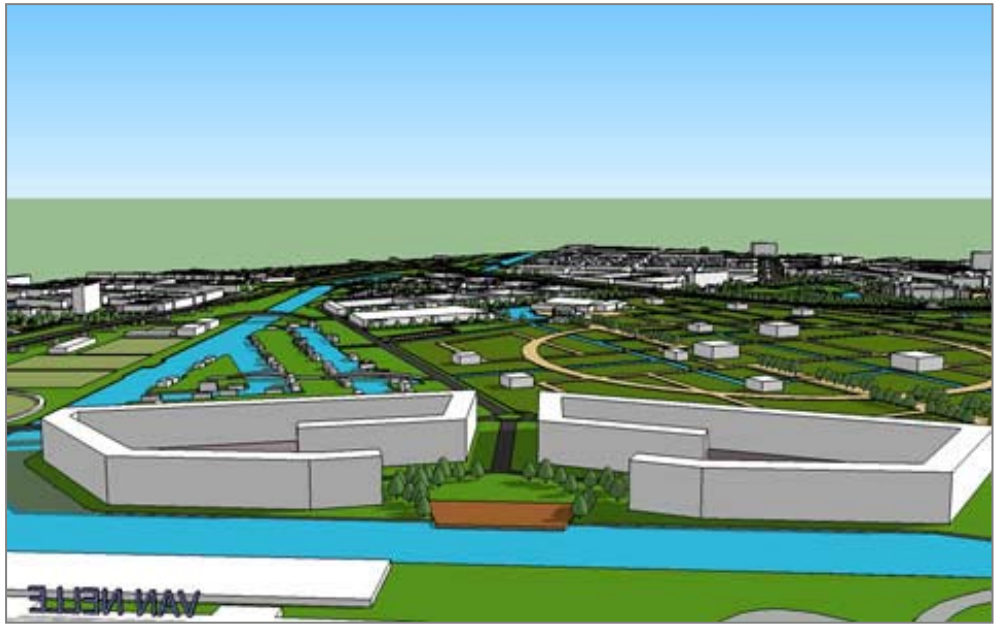


Fig. 173 | View from the van Nelle Factory at the mega blocks

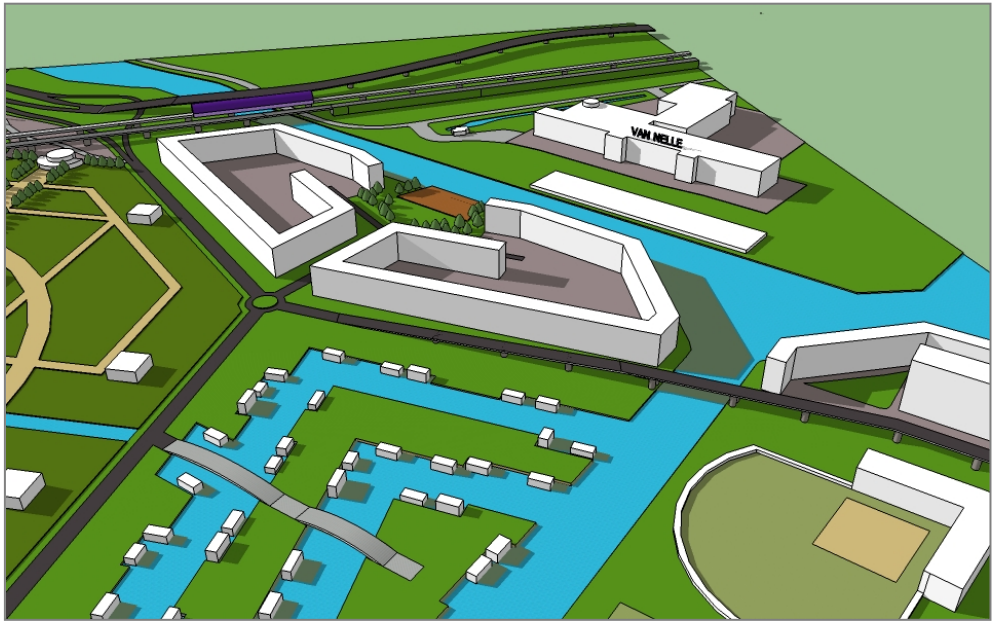


Fig. 174 | Bird's-eye view on the south-east corner ot quadrant C

Fig. 175 | An example of a platform in the water (Zevenhuizenplas)

Referring to the design decision in paragraph 15.3, there will be added dwellings along the Schie in the south-west corner of quadrant C.

The shapes of the drawn building blocks are only an example of a possible solution for this corner. Main point is that the buildings need a chic attitude and will have 6 to 8 floors to be able to impress a person passing-by.

In the centre of the buildings, there is a platform, partly over the water, which offers a nice view on the monumental van Nelle Factory.

Next to the buildings, there is the new light-rail station, so the accessibility of this housing area is very good.

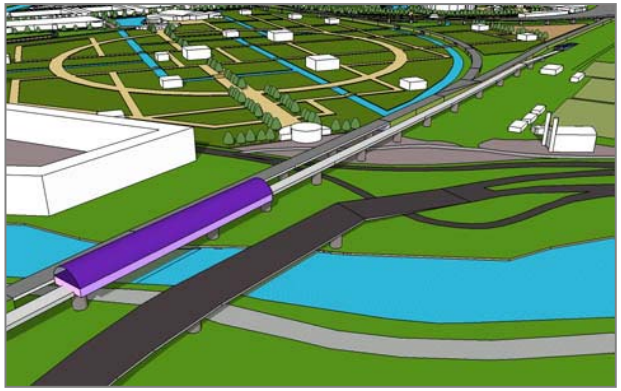


Fig. 176 | New light rail station 'Spangen'

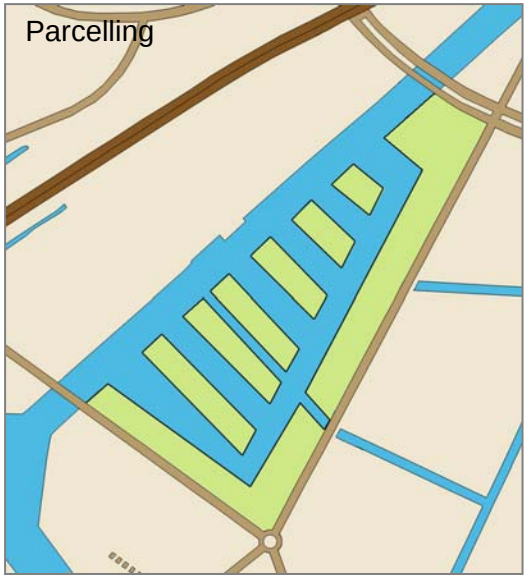
16.3.3 Houseboats

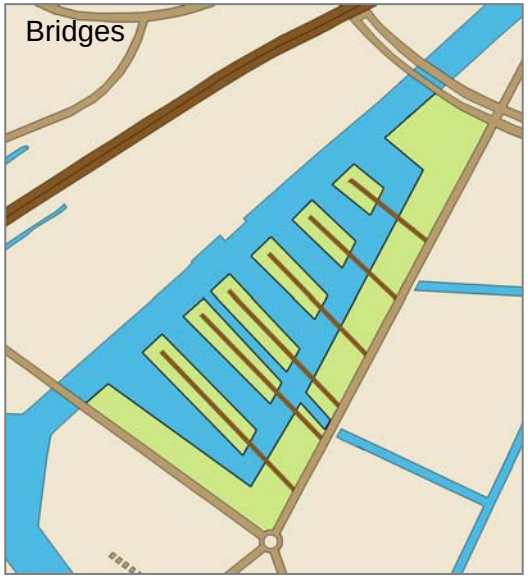
Fig. 177 | Houseboats in the Schiekanaal, all placed head-to-tail (Google Earth)

Fig.180 | New location for the houseboat parcelling (Google Earth)

Fig. 178 & 179 | Current situation of the houseboats in the Schiekanaal

In the Schiekanaal 77 houseboats are situated in the surrounding of the clover-leaf. They are all placed head-to-tail, so it is almost impossible to have a view on the water, when you walk or drive along the Schiekanaal. Together with the design choice to develop the Schiekanaal and its banks as a recreational zone (par. 15.2), this lead to the decision to move the houseboats to another location.
This new location is also along the Schiekanaal, but there is designed a special parcelling, which stabs into the land what nowadays a commercial area is. Because the owners of the houseboats often have pinched the ground surface next to their boat, they will get more surface in advance. A study to the possible parcelling options, lead to the final design.





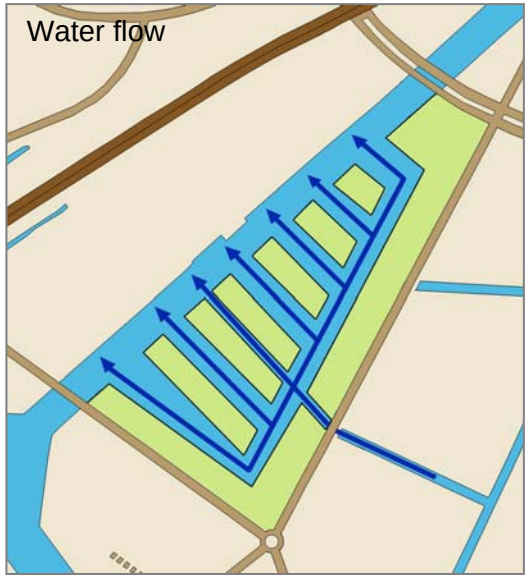


Fig.181 | Alternative I

Alternative I

The first option is only based on rather technical needs (measures of land and canals).

Negative:
Too many bridges, too less land remaining to place houseboats along.

Positive:
Perfect flow of the water.

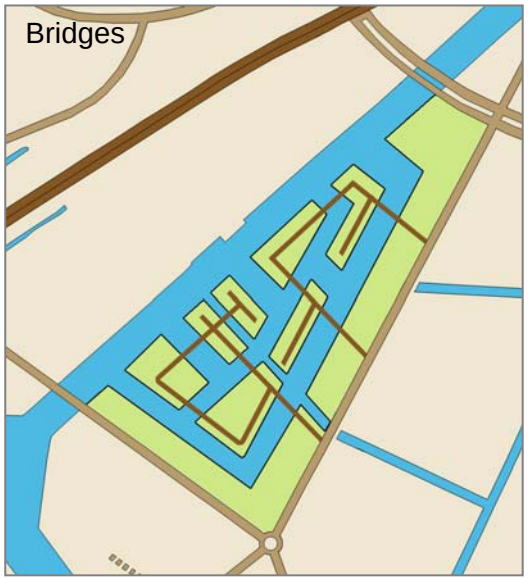


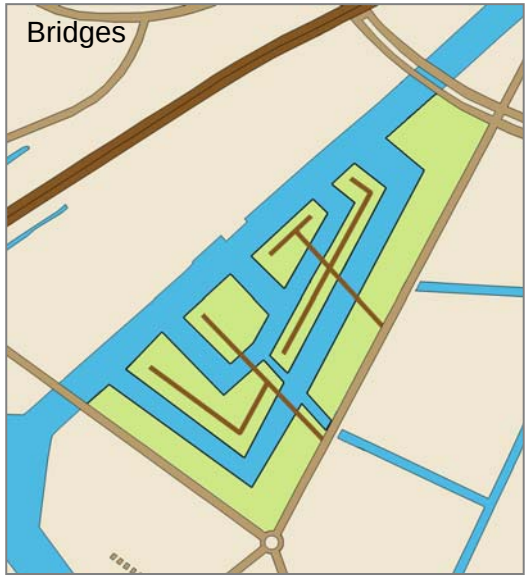
Fig.182 | Alternative II

Alternative II

The second option is based on the first one, but some island joined to reduce amount of bridges.

Negative:
Chaotic parcelling, and problems to place houseboats because of bridges which enclose some areas completely.

Positive:
Water flow is still fine.



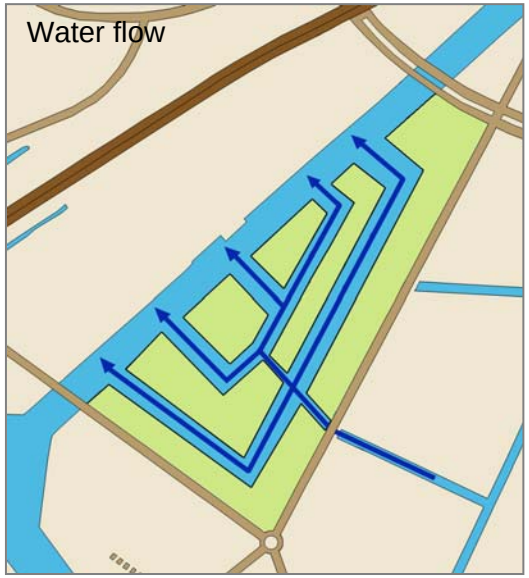


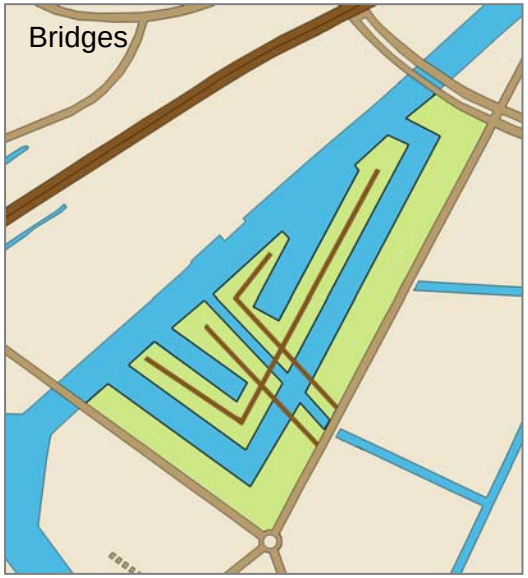
Fig.183 | Alternative III

Alternative III

To make the parcelling less chaotic and to reduce the amount of bridges further, more islands joined.

Negative:
The measures of the big islands: too deep to create gardens of logical shape and size.

Positive:
Water flow is still ensured.



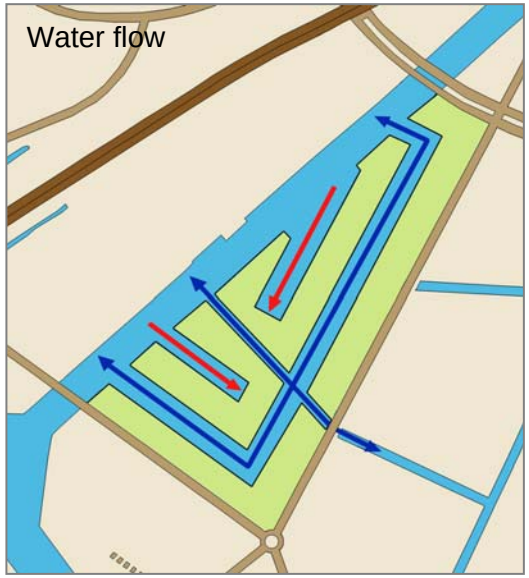


Fig.184 | Alternative IV

Alternative IV

This is a variant on alternative III.

Negative:
Dead ends for the water flow.

Positive:
The measures of the islands are almost ideal to place a lot of houseboats along, ánd to ensure a nice garden for every inhabitant of the area.

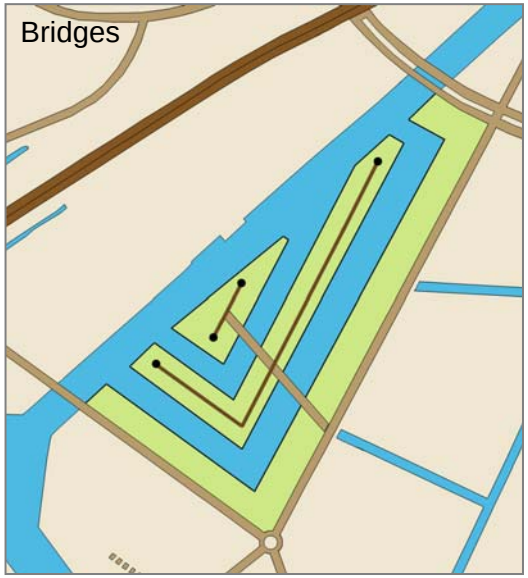


Fig.185 | Alternative V

Alternative V

For this final alternative, number IV only changed a little: the dead-end problem for the water flow is solved. And together with this small interven-tion, the parcelling becomes even more clear than it already was.
An other positive point is the fact that only 1 bridge is needed to access the whole area. This ensures the possibility to place houseboats on each bank!

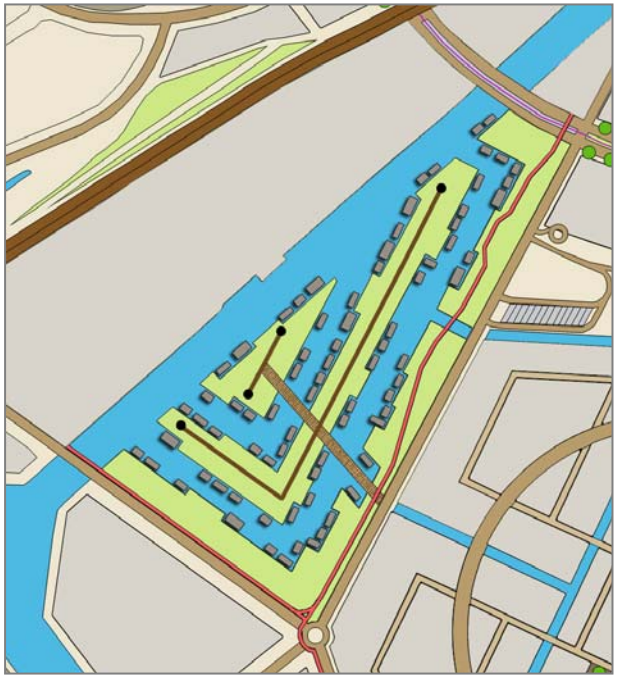


Fig. 186 | Final design with 77 houseboats.

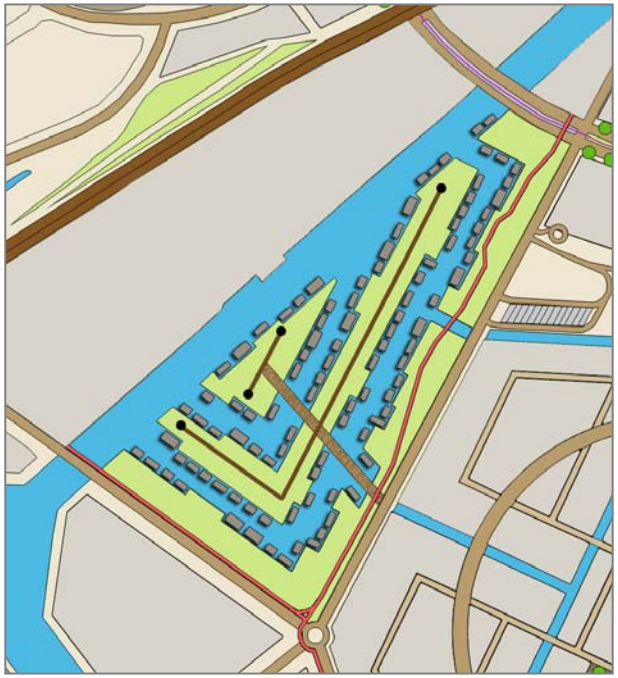


Fig. 187 | Final design with 100 houseboats.

This fifth alternative has gone through a number of smaller changes and the final result is in figure 186. This map shows the situation of the area when the original amount of 77 houseboats is placed in here. Figure 187 shows the situation when the area is filled up with houseboats completely. In this case, a maximum of 100 houseboats can be located over here.

The first change compared to the original design is about the banks, which jump back and forward. This intervention makes it possible to see the water from the road, even if there are 100 boats placed: there is now and then still a possibility to see through 2 boats.

Another change goes together with the design of the new zoo: the water system is improved and on 2 locations connected to the Schiekanaal.

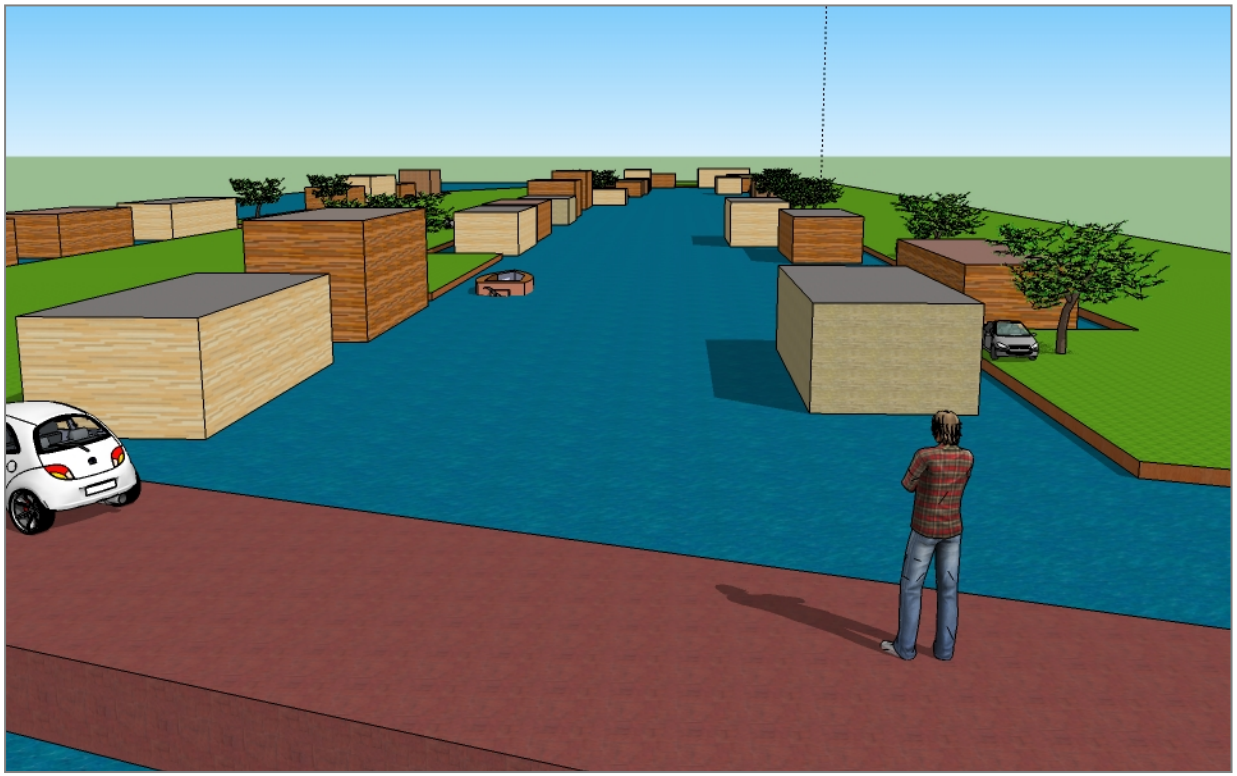


Fig. 188 | 3D impression of the houseboat area, a view from the bridge.

Fig. 189 | Recreational boats navigating through the houseboats

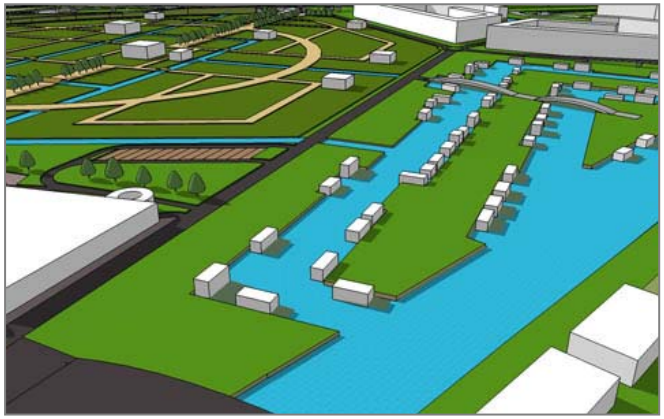


Fig. 190 | 3D impressions of the complete area

Fig. 191 | 3D impressions of the complete area

Fig. 192 | Canoes through the canals

16.4 Quadrant D: Park area

Fig. 193 | Going back to original ground plan

The current zoo turns into a public park with some urban functions in it.
First step is to go back to the original ground plan of 1940, to emphasize the monumental character of this area (par. 11.3).
The Statensingel will be extended to the pond (figure 193 and 197), and in the south a square is designed (figure 198).

Fig. 195 | Statensingel

Fig. 194 | Market on a square

Fig. 196 | Festival or concert

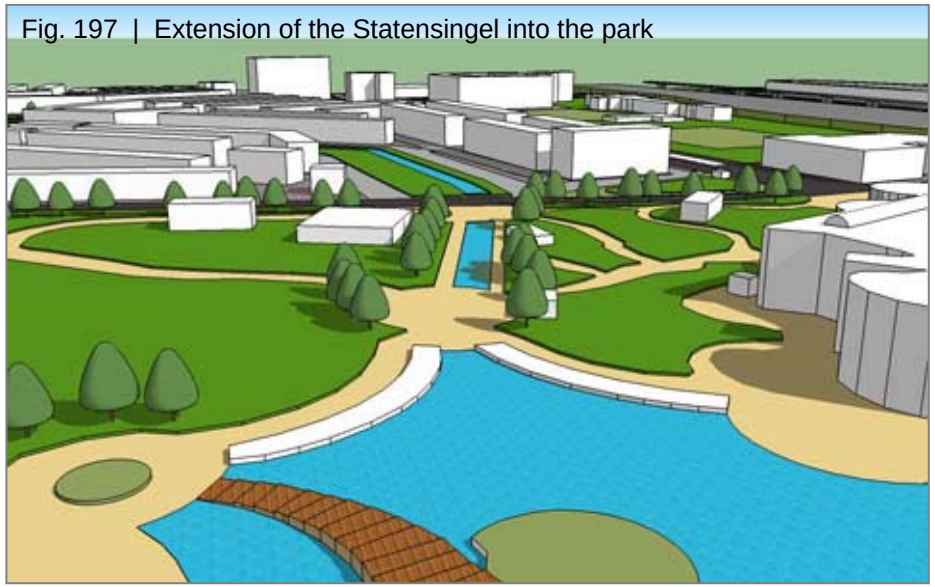


Fig. 197 | Extension of the Statensingel into the park

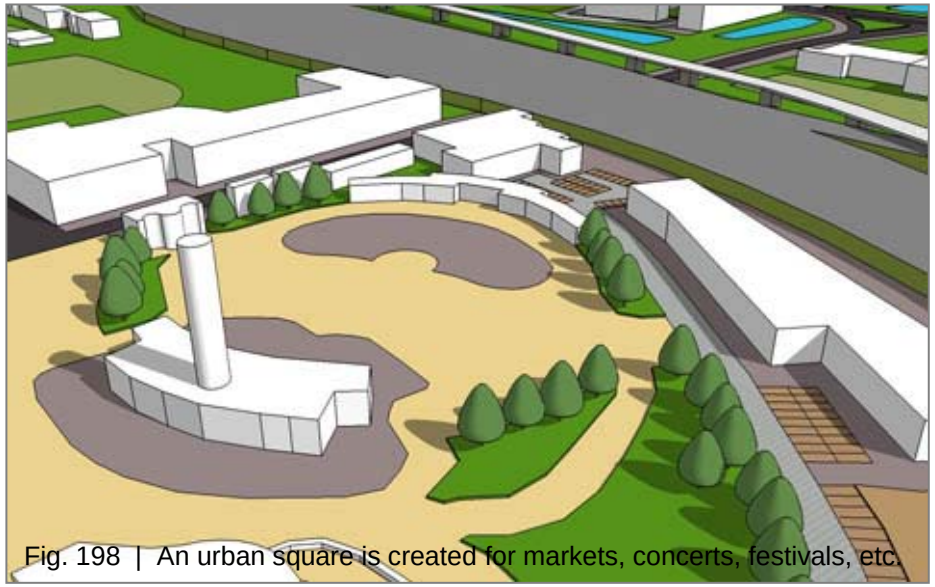


Fig. 198 | An urban square is created for markets, concerts, festivals, etc.

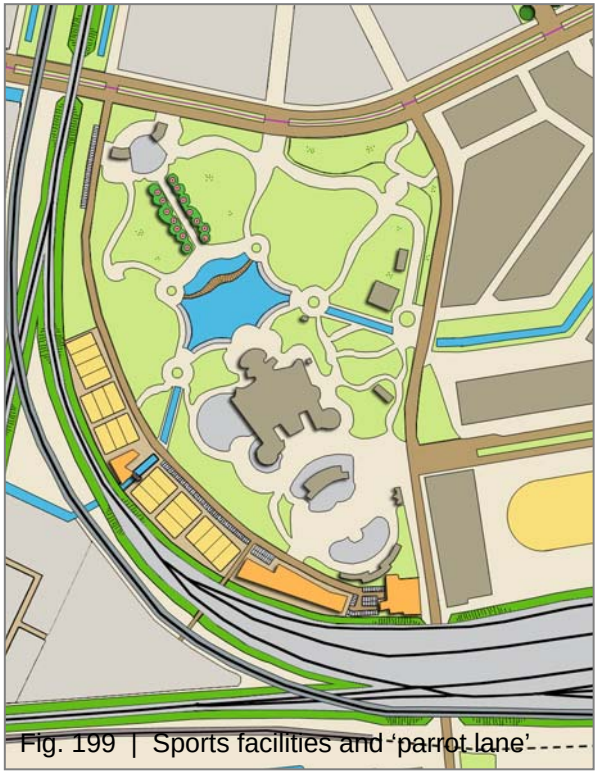


Fig. 199 | Sports facilities and 'parrot lane'

Fig. 201 | Roses at the new lane

Fig. 202 | Original parrot lane

Fig. 203 | Tennis court

The second step in the development of the public park is to fill up the strip of land which originally was not a part of the zoo. This strip is filled with tennis courts; these had to move from the Vroesenpark because of the new living area over there.

Furthermore, the historic parrot lane, from the pond to the tea lounge is restored again but this time not with parrots along the road, but with rose-bushes.

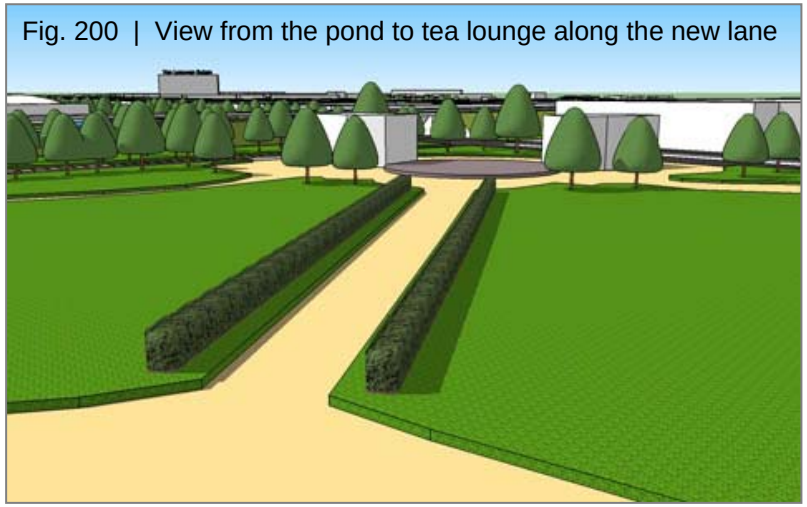


Fig. 200 | View from the pond to tea lounge along the new lane

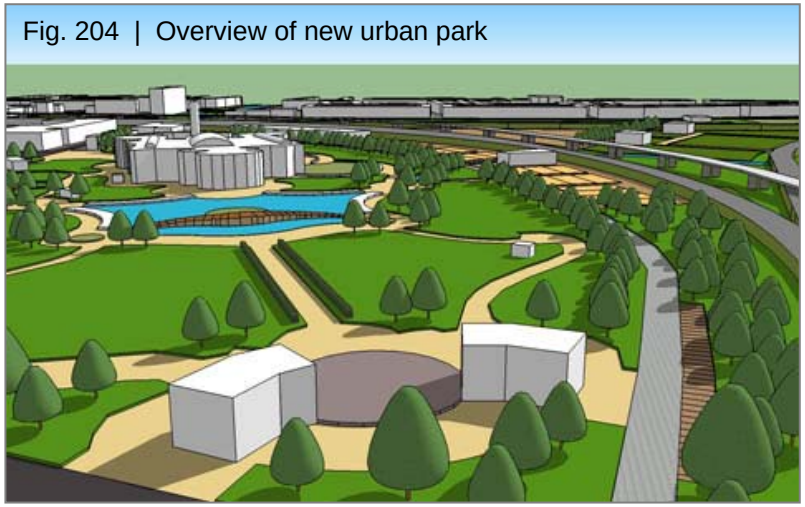


Fig. 204 | Overview of new urban park

Fig. 205 | Plantation and new entrances

Fig. 207 | Relaxing in the park

Fig. 209 | Restaurants with terraces in the Rivièrahal

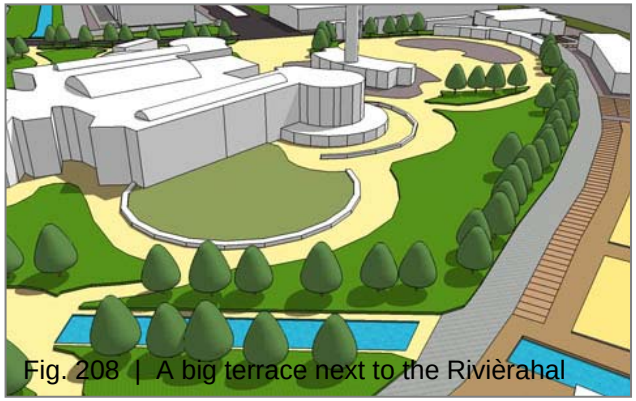


Fig. 208 | A big terrace next to the Rivièrahal

Fig. 210 | A crèche in the Rivièrahal

Fig. 206 | Relaxing in the park

The last step in the design process is to add plantation to the area and to open up the fences which always have been around the zoo. This results in a total amount of 7 entrances, spread over the north- and east-side of the park.

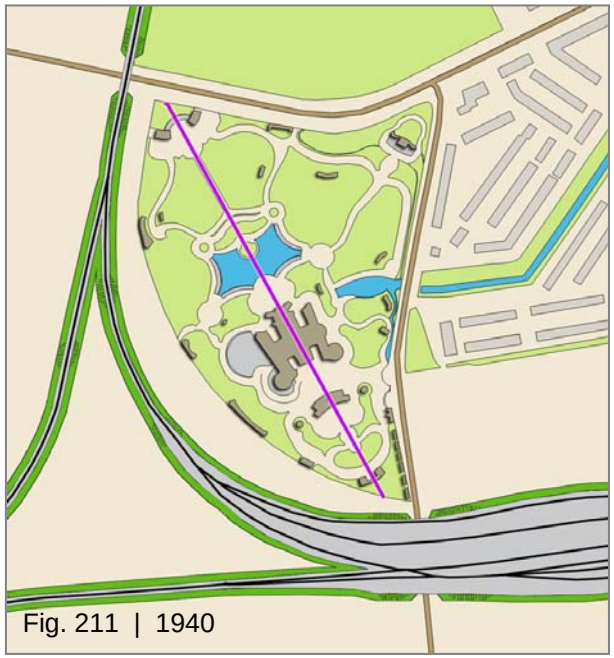


Fig. 211 | 1940

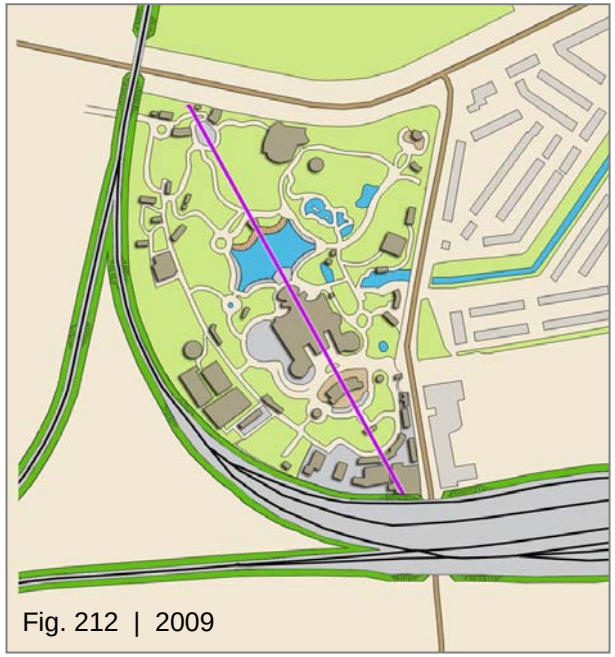


Fig. 212 | 2009

Fig. 213 | 2020

These 3 pictures show the developments in the zoo area from the beginning in 1940 to the result of the new design (2020).

The ground plan was very clear in 1940, but gradually became more messy due to changes in the zoo during the decades that followed.

The new design is a combination of both stages: the ground plan becomes clear again and a lot of zoo-buildings are being demolished (about 10 buildings are re-allocated). On the other hand, there are added a lot of new functions and activities in the park.

The most important change of this area is the fact that is becomes public; everybody can enjoy the beauty of the design by van Ravesteyn.

17. Calculations on the design

Building blocks north-east part	Surface on each floor	Number of floors	Total surface	Surface of each dwelling	Number of dwellings
1	5.016	4	20.064	150	134
2	4.774	4	19.096	150	127
3	4.774	4	19.096	150	127
4	5.016	4	20.064	150	134
5	4.759	4	19.036	150	127
6	4.717	4	18.868	150	126
7	1.020	6	6.120	120	51
subtotal	30.076				826

Building blocks north-west part	Surface on each floor	Number of floors	Total surface	Surface of each dwelling	Number of dwellings
8	4.026	3	12.078	150	81
9	3.234	3	9.702	150	65
10	3.454	3	10.362	150	69
11	3.828	3	11.484	150	77
12	3.806	3	11.418	150	76
13	3.872	3	11.616	150	77
14	4.586	3	13.758	150	92
15	1.116	3	3.348	175	19
16	960	3	2.880	175	16
17	1.865	3	5.595	175	32
18	1.092	3	3.276	175	19
19	1.092	3	3.276	175	19
20	6.048	3	18.144	216	84
subtotal	38.979				725

Megablocks along Schie	Surface on each floor	Number of floors	Total surface	Surface of each dwelling	Number of dwellings
23	8.950	6	53.700	150	358
24	8.950	6	53.700	150	358
25	2.698	6	16.188	150	108
26	1.200	10	12.000	120	100
subtotal	21.798				924

	2.475

Service/business buildings north-east part	Surface on each floor	Number of floors	Total surface
21	4.852	1	4.852
22	3.395	2	6.790
total	8.247		11.642

Fig. 214 | Scheme about the number of new dwellings

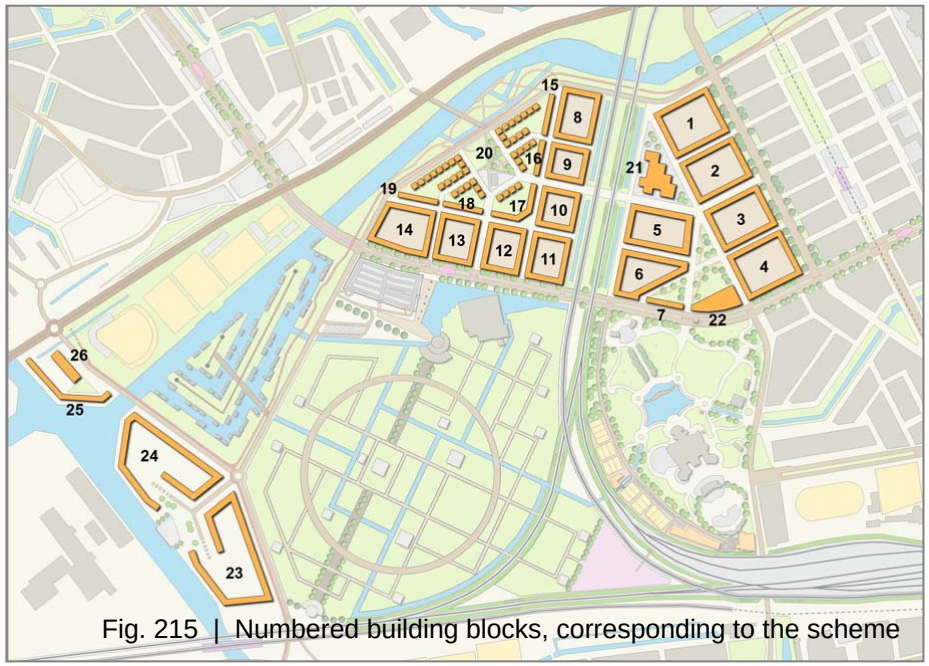


Fig. 215 | Numbered building blocks, corresponding to the scheme

After explaining all (qualitative) components of the design on different scale levels, it is interesting to take a closer look at the quantitative elements.

In paragraph 16.3.1 there was yet a calculation about the new zoo in comparison to the old one.

This page shows the amount of new dwellings that can be added to the area. In the calculation, there has been chosen some starting-points like the average surface each dwelling and the number of floors for each building block.
The result of this calculation is a number of 2475 new dwellings.

On the next page a scheme is presented which shows the surfaces in the old and new situation for different functions.

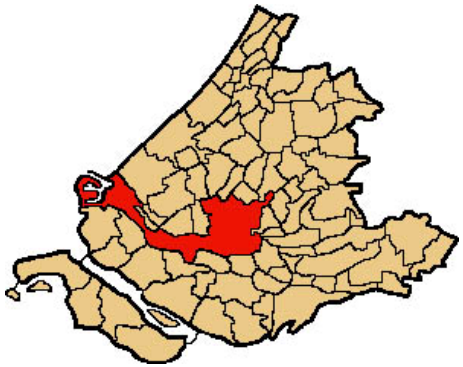
Old situation		pieces	ha
Public parks	Vroesenpark		11,4
	Roel Langerakpark		10,5
			21,9
Blijdorp Zoo			**28,1**
Sports facilities	Tennis courts	27	3,5
	Soccer fields south	6	7,4
	Soccer field Overschie	1	1,5
	Soccer field north	1	1,1
	Baseball stadium	1	2,1
	Manege	1	0,4
	David Lloyd health club	1	0,7
			16,7
Allotment gardens	Tot Nut en Genoegen		5,3
	Streven naar Verbetering		8,2
			13,5
Camping site			**3,0**
Marina			**1,8**
Strip of land, took up by owners of houseboats along Schiekanaal			**1,0**
Business area (buildings)			**7,5**
Surrounding area			**7,7**
Railroad triangle surface			**6,0**
Remainder space/green			**1,0**
			108,2

New design		pieces	ha
Public parks	Park Blijdorp		16,5
	Neighbourhood parks	2	4,8
			21,3
Blijdorp Zoo			**43,9**
Sports facilities	Tennis courts	20	
	Soccer fields Schiekanaal	3	
	Baseball stadium	1	
	Manege	1	
	David Lloyd health club	1	
			10,8
	Soccer Spaanse Polder	5	
	Tennis Spaanse Polder	8	
			6,1
Combination houseboats and allotment gardens		max. 100	**9,2**
Business area (buildings)			**1,2**
Surrounding area			**0,6**
Living area			**21,4**
			108,4

Fig. 216 | Scheme with comparison (in ha) between old and new situation

18. The results of the design on the 7 scale levels

 **COUNTRY (NL)**	- Blijdorp Zoo remains in Rotterdam (as an important icon for the city), but it will be easier to reach, as well by car as by public transport. - The new Diamond of highways around Rotterdam will have a better flow of traffic because the through traffic will be partly split from the traffic with a destination in Rotterdam itself. - The HSL will be finished by following the existing plans; no changes are needed on this railroad to develop the urban design in the clover area.
REGION (Z.H.) 	- The new light-rail connection to Hoek van Holland, which replaces the NS railroad on that route, makes the east-west travel time through Zuid-Holland shorter. - The light-rail connection to the Hague (instead of the Hofpleinlijn) gets a station at the Statenweg (real plan). Because in the new design there will be added a great amount of new dwellings, the perspective for the success of this station becomes better.

 **CITY (R'DAM)**	- Rotterdam will keep an important tourist attraction in the city: the zoo. But the quality and possibilities to each it, improve. - About 2.500 new dwellings are added to the city. - The network of public transport will be improved and enlarged, with better connections to switch from one to another system (from tram to light-rail or light-rail to train).
TOWN DISTRICT (NOORD) 	- Town district North will benefit from the 2 new exits from the A20. Although the A20 no longer will be a highway but a Provincial road with a lower maximum speed, it ensures an easy flow of traffic with a destination in Town district North. - The Town district is easier to reach by the new tram connection between Rotterdam CS and Rotterdam Airport. This direct tram connection can be made, thanks to the downgrading of the A13. - North (Blijdorp, Bergpolder) is a popular district to live in. Nowadays, the variety of dwellings is relatively small: mainly houses with a porch, 4 or 5 floors high and 70 to 90 m² surface. By adding the new designed building blocks this variety will improve: More dwellings with their front door at street level, 100 to 150 m² surface and more safe space for kids to play and to park cars. The need to move out when families get children, is not there anymore. - The recreational zone along the Schiekanaal goes through the complete town district. This means that the inhabitants get a place to sport, play and relax next to their house (ánd a new urban park!).

CLOVER AND SURROUNDINGS

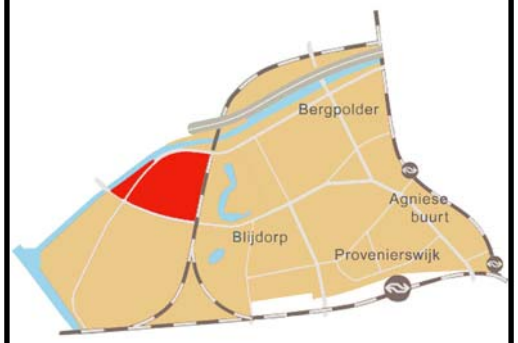
- The new clover-leaf of Blijdorp is no longer an area to pass through as quick as possible (or: it is no longer a border of surrounding neighbourhoods), but is it worth to actually stay (live, work, recreate) in the clover: The east side is better connected to the city by the making the zoo a public park and by extending the living area. The west side becomes a new recreational strip along the Schiekanaal: this binds both Overschie and North together.

- Not only the clover-leaf itself profits from new elements, like a new light-rail station, new exits from the A20 or a new park, but also the people who live in the surroundings of the clover, can make use these elements.

COMPLETE CLOVER

- The internal connection between different leafs is improved: by 3 new underpasses under the railroad (2 in the new zoo at the railroad triangle and 1 between both new living areas), it becomes much easier to experience the area not any longer as separate parts but much more as 1 huge area.

- The fragmentation of all different functions in the clover as it was before, has disappeared. By concentrating certain functions, like houseboats, a park or sports facilities, it has much more strength and positive attitude than before. The area is no longer a ‘coincidental environment’ but an area where regulation leads to organization and though to success (1+1=3).



CLOVER LEAF AND SMALLER

- Each clover has 1 main function and spatial way to show this. This makes it very clear to people what is happening in each area: 1 big zoo, 1 big park, a chained living area, etc.

- The new houseboat parcelling gives a complete new interpretation of living on houseboats. In the current situation, people have only a small strip of land near their boat and it all becomes a little messy by the lack of space. In the new design, it becomes a luxury to live in a houseboat: every owner has a large garden, space to park a car and more privacy than before (the boats are not anymore placed head-to-tail). In fact, this area becomes a mix between houseboats and allotment gardens like there were before in the clover.

- In spite of the complete new design for all clover leafs, there will still be references to history: the extending of the Statensingel into the park, through the new zoo, to the Schiekanaal for example. Or the re-allocation of the monumental buildings in the new park. Those ‘hints’ give the new design character.

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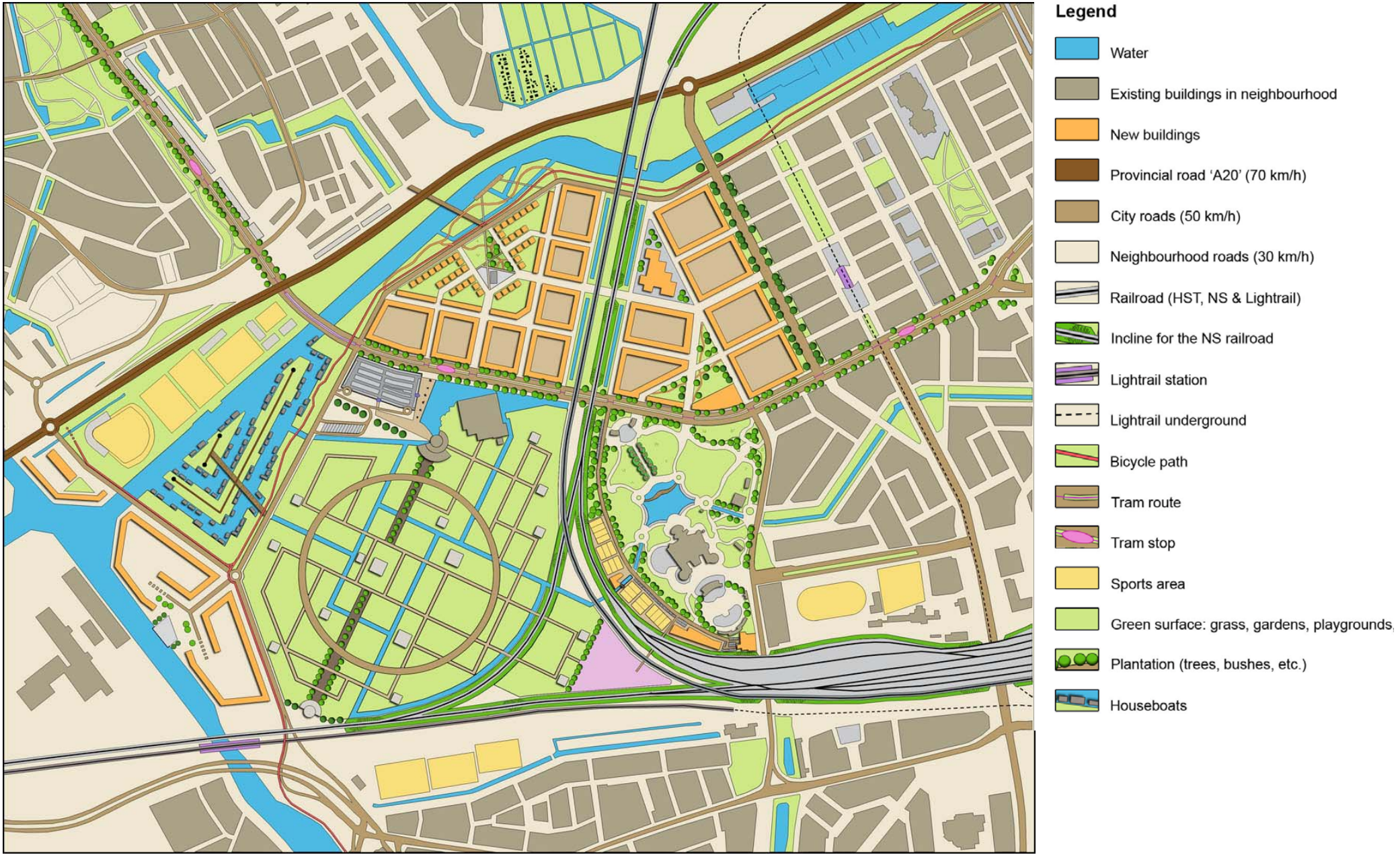
Appendix 1: Complete map of the design



Appendix 2: Motivation poster

"Bokito breaks out, humans move in"

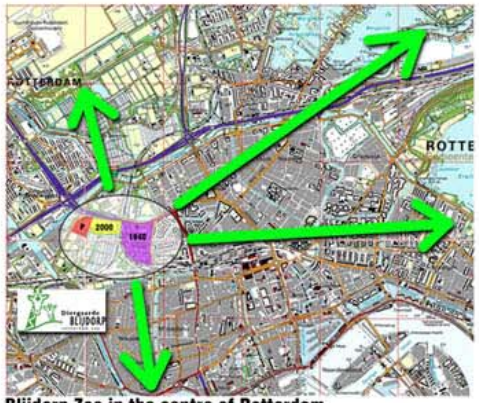
Masterplan Diergaarde Blijdorp 'reloaded': an alternative design for this urban area instead of expansion of the zoo inside narrow boundaries

MOTIVATION POSTER

Keywords & Fascination

Urban area, particularly Rotterdam
Thirties-housing: Blijdorp
Societal issues in cities: safety, anonymity
Connection public-private space
Historical (monumental) objects
Mobility: car parking, public transport

Location



Blijdorp Zoo in the centre of Rotterdam

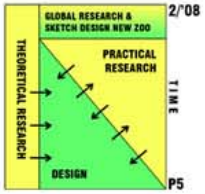
thirties ambiance: typology & structure, water, green & space

Motivation

1855 - A small zoo opened at the Kruiskade
1924 - This zoo became old-fashioned and the Kruiskade-area became too busy
1937 - Decision to move the zoo to Blijdorp
1940 - Blijdorp Zoo on present location opened
1988 - Masterplan Blijdorp was launched: more space for the animals in natural biotopes, divided into continents
2000 - A space-gap! Enlargement of the zoo at the other side of the railroad: the Oceanium, a new parking-place and a new main entrance.

Enlargement of the zoo between narrow boundaries can be OK, but it challenges me to **handle with an alternative**: replacing the zoo to another part of Rotterdam and redevelop the area into a new urban structure and functions, because:
- the railroad cuts the present zoo into two seperated pieces, a lack of coherence;
- the area around the location is a very popular district to live, near the city-centre;
- ground is too expensive to use for such a big parking-place;
- 85% percent of the guests visit the zoo by car, so there is no need to stay this close to Rotterdam CS and city centre.

Approach to the project



1. Global research and design (to move Blijdorp-Zoo)
2. Theoretical Research
3. Practical Research
4. Design old Zoo-location

Research & Design Goals

1. Defining a new location for Blijdorp Zoo in another part of Rotterdam with more space for the animals, future expansion & parking and less interference for the direct neighbourhood. This will be a rough sketch to prove theoretical possibilities.

x(y)
animal(human)
human(animal)

2. Developing a design for the surface of the old Zoo-location in order to let it function like a city centre district. The emphasis of the research and design will be on: a. a logical morfological connection to the existing structure of the popular housing area of Blijdorp; b. keeping the employment on the same of a higer level; c. considering historical/monumental buildings that has to keep their appearance; d. creating a living environment for the intended target group; e. profit from and co-operate with existing and future mobility lines, like Randstadrail; f. create an urban area with spatial conditions that resolve problems which occur a lot in urban areas, like social unsafety and anonymity of inhabitants.

Randstad-Rail

Historical Buildings

Matching Lab's

Urban Regeneration & Mobile City

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Appendix 3: Themes from the design scheme with their interventions: new/maintained/lost

Themes	New functions	Maintained function on the same location	Maintained functions, but at another location	Lost functions
High Speed Train		Maintaining the current HST route and shape of banks		
NS railroad	New underpasses (3)	Maintaining the current railroads		
Highways (diamond)	Connection from Terbregseplein to A13 around the city	A13 becomes urban boulevard from Overschie to city-centre		The highway character of A20 and A13 disappears
	Extending/Completing the A4	A20 becomes 'Provincial road' between Spaanse Polder and Terbregseplein		Kleinpolderplein disappears: unnecessary after downgrading of A20 and A13
	New exits (2) from A20			
Randstadrail (the Hague)		Living area can profit from station at the Statenweg		
Randstadrail (HvH)	New station at the overpass of the Schie: neighbouhoods and new zoo profit from it	Railroad becomes lightrail		
Public transport in general	Tram connection from R'dam CS to Rotterdam Airport			
City roads	New exits from A20 (2), which create new north-south connections through city	A13 downgraded to urban boulevard with broad profile		
Schiebanks developing	Urbanization on Schiebanks with high-quality character			
Schiekanaal banks	Recreative and green zone on banks			

Themes	New functions	Maintained function on the same location	Maintained functions, but at another location	Lost functions
Green-/canal structure	Extending canal structure into new public park with zoo-axis as mirror axis	Maintain and expand logically		
Public park	Monumental buildings of old zoo get urban functions (horeca, cultural activities, art gallery, crèche, festival stage, etc.)		Old zoo area becomes new public park	Vroesenpark disappears and turns into living area
			Layout/Groundplan of original zoo (1940) restored	Langerakpark disappears and turns into the new zoo
Sports area			Soccer fields, Tennis courts, Baseball stadium Neptunus, Manege, David Lloyd health club move to Overschie along the Schiekanaal, Spaanse Polder and sports strip in new park	
Allotment gardens/houseboats			Modern combination and parcelling of houseboats and allotment gardens (max. 100 p.)	Classic allotment gardens (2): Streven naar Verbetering' and tot Nut en Genoegen'
				Classic houseboat arrangement along the Schiekanaal (73 p.)
Other recreational functions	Park-strip along Schiekanaal, connected to neighbourhood park			Camping site and Marina disappear
Industry/business activities			Business area can move further to the west of Rotterdam	Business surface reduced until almost zero in design area
				Prison 'the Schie'

Themes	New functions	Maintained function on the same location	Maintained functions, but at another location	Lost functions
Living area/urbanization	About 2.500 new dwellings in design area Adding of new dwellings along downgraded A13 in Overschie Large building blocks with intern car-parking			
Blijdorp Zoo		The Oceanium and entrance building stay where they are	A modern zoo, 50% growth in comparison with old zoo-area	Old zoo turns into public park
Neighbourhood roads	New underpass in living area underneath railroads			
Neighbourhood parks/green	Continue structure of small neighbourhood parks into design area (2 new ones)	Maintain neighbourhood parks at Statenweg and Noorderhaven-kade		