Thesis

Living on Crunchy Street

Redesigning the site of the departing Calvé /DSM factory in Delft as a socially sustainable district.

Graduation lab Urban Transformation and Sustainability
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P5 report for the Graduation lab Urban Transformation and Sustainability

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1. Introduction

1.1 Frame graduation project

"According to which characteristics and which method can a district be designed that contributes to the sustainable development of the knowledge city Delft in the case of a conscious use of self-organisation?" (Van der Kooij, 2008b: 20)

This research question was answered in the first part of this graduation project. Based on the characteristics and the method that were researched in the thesis plan, a design was made for the Calvé/DSM site in Delft. It is a factory site which is being abandoned by its users, leaving 16 ha to be developed in the coming future. The aim is to develop a socially sustainable creative district through means of self-organisation. The project is restricted to the borders of the design location and takes the open urban system, in which it is set, as context. (Van der Kooij, 2008, 18)

The leading premise of the graduation project's frame is that the knowledge-economy based city is not driven by industrial production anymore, but by the pre-eminence of information and knowledge as a core product. (Wilson, unknown) Both information and knowledge thrive in creative milieus, characterized by liveliness, informality, spontaneity and structural instability. (Landry, 2000) These characteristics are fundamental qualities of open and complex systems. Such systems, our cities, self-organise themselves independent of our scientific predictions and planning rules. (Portugali, 1997) The ability to self-organise one's surroundings, or in other words the dynamic quality to change one's living-environment, is fundamental

1.2 Self-organisation as the central theme

Dealing with self-organisation in process and design is...
what distinguishes this project. It is necessary to create a successful knowledge district and to make it socially sustainable. The method chosen for this design study uses a matrix as a testing and selection instrument. This Matrix method is used to streamline the organisation of urban space by its stakeholders. The basic assumption of this approach is that “urban planners can play a pivotal role [in urban processes] by mapping out the existing situation, reconnoitring the various starting-points, assessing the margin for potential solutions, and then translating the outcomes of this process into a clear-cut plan.” (Veldhuis, 2003) The design method is also used as the structure for this report. It is presented in paragraph 1.5.

Research in the thesis plan (Van der Kooij, 2008a) and two papers (Van der Kooij, 2008b; Van der Kooij 2008c) has led to formulate fourteen characteristics for the design of the district. Five of these design criteria are spatial preconditions to enable successful self-organisation of an urban district. The five rules imply creating recognisable territories, as these provide a readable privacy-zoning. This enables every individual-resident, visitor or passer-by- to regulate their own social contacts. This should not lead to a social network, but it does make the resident jointly-responsible for their physical and social surroundings. (Van Dorst, 2005: 257)

1.3 Problems in the development of Delft as Knowledge city

“A change in culture is needed to bridge the division between ‘traditional Delft’ and the knowledge sector.” (Kraaijestein, 2002:5)

Knowledge-based economy is a very abstract concept, for which Delft seeks a symbol. A symbol that should confer ‘Delft, Knowledge city’ to its population and potential entrepreneurs and workers. At the time the so called knowledge-industry is located most clearly on the university campus, the business park Technopolis and Delft Tech park. All three a long way from the city-centre and hardly integrated in the city. Both are (being) situated in a park, a campus-environment, which will also not attract many inhabitants of the city and so prevent social mixing.

The Calvé area and the DSM area east of the railway line, directly north of the inner-city is an interesting area to show that this should not be the case. It can be a lively district integrated into the city. A pleasant and attractive living and working environment for knowledge workers can be developed. Delft’s knowledge workers should become knowledge inhabitants and contribute to the city.

Figure 1.2 shows the city Delft is about to expand northwards. The municipality Rijswijk will develop the southern part of their municipality, neighbouring Delft. The total area Rijswijk wants to develop is circa 90 ha. large and will include a new railway station for regional trains. These regional trains will connect with a high frequency to cities in the province South-Holland such as Rotterdam and the Hague. This concept is known as Stedenbaan and implies a role for the expansion and the design location at the regional level.
1.4 Framework for sustainable development

“Social sustainability is focused on the development of programs and processes that promote social interaction and cultural enrichment. It emphasizes protecting the vulnerable, respecting social diversity and ensuring that we all put priority on social capital.” (Interface sustainability, 2008)

On the one hand the focus on social sustainability in this project is a critique on the current policy in Delft. As explained in the previous paragraph, the knowledge economy is isolated from the city. This makes it exclusive for knowledge workers, although it should be inclusive for all inhabitants of the city. On the other hand social sustainability has to do with social quality, the quality of the living-environment. Van Dorst (2005) has shown that the dynamic quality to change one’s living-environment, i.e. to self-organise it, is fundamental for reaching social sustainability. Van Dorst (2005: 253) also states that a basis for further sustainable development can be established through social sustainability and livability:

“In this case sustainable development is built up out of sustainable livability, environmental quality, spatial qualities and prosperity. (…) In-livability should therefore first be combated and this can also relate to the improvement of the supposed sustainable livability, before there can be any attention from the user-perspective for non-livability related sustainable facets.”

This makes the abstract concept of sustainability a much more tangible concept. It also shows how from social quality other sustainable qualities can be reached. This leads to figure 1.3, showing in a diagram the desired impact of the design. It has been based on the work of Duivesteijn (2006).

Inhabitants of Delft are taking influence on their city. Positive initiatives are the civil participation in the ‘Poptahof’, but also the ‘Redesign the city’ project initiated by DN Urbland. For the latter, workshops were organised in which different stakeholders made plans for redesigning several locations in Delft. Also the Delft architect Ineke Hulshof is striving for an ‘Art factory’ at the Calvé/DSM site. She was the first renter of the Bacinol building and led the adaption of this former laboratory into an office building for creative enterprises. She is now working on the physical moving of the Bacinol building, to save it from forced demolition. This initiative is necessary as the railway-tunnel through Delft, build in the coming years, needs space for its construction.

1.5 Reading guide

As was mentioned in the second paragraph of this chapter, dealing with actors calls for a special method. The matrix method which was chosen also serves as a structure for this report. In figure 1.4 on the next page the design method is shown as a diagram. It -and thus the report- is comprised of three parts: situation, urban reconnaissance and urban plan.

In part 1, the current situation is dealt with. First the problem field is described in chapter 2, explaining the
problem on three scale levels. Starting from the macro level and zooming into the meso and micro level. The next chapters continue on these last two scale levels. First chapter 3 shows a meso level analysis illustrating the situation in the city Delft and the surroundings of the site. In the following chapter the micro level analysis is presented. This is the scale of the design location. This chapter is based on the Atlas finished at the P3 in October 2008. In chapter 5, at the end of the first part of the report, the design criteria are summarised. These are based on the research until the P2 in June 2008, the thesis plan and two papers on self-organisation.

Part 2 of this report shows the urban reconnaissance that was done. It starts in chapter 6 with the initial models, based on the ideas of the three relevant groups of stakeholders. Based on these three models the first matrix is presented and evaluated in chapter 7. After presenting the improved matrix in that chapter, the improved models are shown in chapter 8. The product of this reconnaissance are the models ‘Creative factory’, ‘Urban garden’ and ‘Canal district’.

In the third and final part of this report the conclusions of the urban reconnaissance are taken and the plan is elaborated. In chapter 9 the second matrix is evaluated to come to the preferential scenarios. These show a plan to develop the location over the next 20 years. The scenarios are evaluated in chapter 10 through means of an ex-ante evaluation. This does not only include criteria from the design brief, but also relevant criteria which have not been explicitly stated. Based
on this evaluation the design is further elaborated into an urban plan in chapter 11. This last chapter is the conclusion of the report and shows the plan and its building blocks for the development of the Calvé/DSM factory site.
Part 1 - Situation

In this first part of the report the first step of the matrix method is executed: The existing situation is mapped. First the problem field is discussed on macro, meso and micro scale levels. In the next chapter the analysis of the design location is presented. First on the meso scale, which deals with the scale of Delft and the surroundings of the Calvé/DSM factory site. The location is shown more precise in the next chapter, summarising the most important information of the Atlas Calvé/DSM (Van der Kooij, 2008d). After this the design criteria are presented in chapter 5. These are based on the research done in the first half of this graduation project. These form the basis for the urban reconnaissance and urban plan in part 2 and 3 of this report.
2. Problem field

2.1 Macro problem

The world is changing. A radical displacement is taking place. A displacement impacting inhabitants of all developed nations of our planet. Industrial states of before are now seeing their industries depart to low-wage countries such as Brazil, Russia, India and China. Western societies are now adapting to post-industrial conditions and aim their arrows towards a knowledge-based economy. Facilitating the knowledge industry is crucial to strengthen a city’s competitive position. Only so can a city remain prosperous.

2.2 Meso problem

This is also true for the Dutch city Delft. It has seen its traditional industries departing for several years now. Its reaction is to focus on the development of Delft as a knowledge city, as a city with a knowledge-based economy. The city has long since been the location of a prestigious technical university and of several large research institutes, such as TNO. However this policy is not very successful, it fails the right conditions for businesses. Figure 2.2 on the next page proves this: Other cities have had a far greater growth of employment from 1996 to 2002. Delft is almost at the bottom of this graph.

The reason for this is that the knowledge industry is
located at the outskirts of the city, as if it were traditional industry. Although this provides good regional accessibility for the workforce from other localities, the areas are segregated from urban liveliness in the town. In fact there is no urban liveliness on the TU Delft campus and the knowledge campus Technopolis, especially after working hours. These two knowledge districts are characterized by solitary, self-sufficient buildings in park-like surroundings. It can therefore be argued that this will not result in an interesting stimulating milieu. The knowledge-workforce has no possibility of influencing their urban environment, adding nothing to improve or change it. In spite of the fact that this is the key to what makes cities interesting and liveable, the municipality is continuing this policy. Moreover Delft will stay in a situation in which it will predominantly have knowledge workers and only few knowledge inhabitants. This is a fact, as for example only a third of TU Delft employees actually lives in Delft at this time. Finally this will not create a knowledge city physically identifiable to all inhabitants, ergo resulting in segregation at the scale of the city.

2.3 Micro problem

May 30. 2008 the Calvé factory closed its doors. After years of reorganisations and layoffs it is now being relocated. (ANP, 2008) The neighbouring DSM factory is now undergoing reorganisations and following global tendencies it will eventually close doors as well and be moved to some low-wage country. (Broos, 2007)

This trend can be strongly seen on the eastern part of DSM’s factory. This is the oldest part of the factory and a lot of buildings have been demolished in recent years. (Van der Kooij, 2008d)

This is an opportunity for Delft to locate one of its knowledge districts there, but this time a district not exclusively for knowledge workers, but for all its inhabitants. There is a potential: The site is located next to the historic inner city, neighbourhoods historically built for the factory workers and therefore well integrated with the site. In addition there is also the chance to strengthen the location's position in the regional open urban system with Rotterdam and the Hague: Already located along multiple bus and tram routes, there is also the chance of a railway station opening in the proximity. In spite of the chances at hand, the municipality will probably try and segregate the knowledge district as other knowledge districts developed in the city.

This critique and this probable future context are the basis for my final project in urban design at the TU Delft. In the next two chapters the analyses for the meso and micro level are presented. In chapter 5 the design criteria are presented based on these analyses, the thesis plan and the two papers.
Fig. 2.4 Site of DSM and Calvé in Delft
3.1 Introduction

In this chapter the meso scale analysis is presented. It encompasses the urban analysis of Delft and the analysis of the surroundings of the site. The urban analysis shows the field of developments in which the task is set. This makes the spatial future context explicit.

In the first part of this chapter the developments in the city Delft are discussed by three maps which summarise the different plans, zoning plans and infrastructure plans which take an influence on the city Delft and thus the location. The first map will show the location and the direct surroundings of the site. The second will show the connected knowledge districts and the third gives an overview of all developments in Delft.

The second part deals with the surroundings of the site. It shows the problems concerning DSM, the quality of the surroundings and the opportunities that exist. In paragraph 3.3 the problems and developments at the DSM/Calvé site are described. It will describe the environmental problems with the remaining part of the DSM factory.

Paragraph 3.4 illustrates the infrastructure next to the site. The impact of the railway tunnel that will be build is shown. Also the limitations of the infrastructure is shown. The next paragraphs deal with the buildings and neighbourhoods, the green space and the water around the site. These are three issues that return in the exploratory models in part 2 of this report.
3.2 Summary maps of Delft

From this map can be concluded, that the position of Delft in the southern wing of the Randstad, between the Hague an Rotterdam will be further strengthened by the Stedenbaan. This is a metro-like system of trains along the railway-axis from Leiden in the north, to Dordrecht to the south (Atelier Zuidvleugel, 2006). The possibility of a third Stedenbaan station opening at the very northwestern corner of the site in 2020 has been laid down in the zoning plan of the municipality Rijswijk (Gemeente Rijswijk, 2008). The regional structure plan Haaglanden, quoted in this zoning plan, a doubling of the tracks as well as a minimum of 6000 dwellings is necessary to create the new station.

This plan for the new district known as ‘Rijswijk Zuid’ is formulated for an area of circa 90 ha. The aim is to create a ‘rural-urban’ district with an emphasis on ground bound dwellings, but with space to develop apartment buildings. One of the other goals is to create a bus lane between the station and Wateringse Veld, a new town to the west. This may possibly be lengthened to Ypenburg to the east and transformed into tram tracks in the future.

The new district, with primarily housing, can be connected to the city Delft via the DSM/Calvé site and take advantage of its qualities.

The development of the railway zone, a result of the railway tunnel to be build through Delft in the coming
years, implicates a large change for the city. The inner-city and the Hof van Delft will be more connected and a new city axis from the north to south will be created. Except for the new station and city hall, there will be no buildings built on top of the railway tunnel. The ‘roof’ of the railway tunnel will be transformed into a park. This is shown in paragraph 3.4 in more detail.

The second summary map shows the connected knowledge districts. The zoning plans of the municipality show developments in the southern part of Delft. The two existing knowledge districts in Delft - Technopolis (Gemeente Delft, 2005) and the TU campus (Gemeente Delft, 2008) - are developed. Also, the ‘Schieoevers’ (Gemeente Delft, 2006) is developed as an office and housing district. The TU North area will exclusively be developed as a housing district. The new tramline 19 will connect Delft’s three knowledge districts - the Calvé/DSM site can become the third- with knowledge districts in the Hague.

All these projects are currently in realisation, but even more is changing in Delft. The third summary map will show this.
In this map the total developments in Delft can be seen summarized. The renovation of the Poptahof is a relatively small intervention. The Harnaschpolder, in the northwest of the city will be developed as a housing district of circa 6000 inhabitants (Harnaschpolder Delft, 2008) and a district for factories and enterprises (Bedrijvenschap Harnaschpolder, 2008). When added up the total amount of new inhabitants expected in the railway zone, this amounts to almost 7500 new inhabitants for this small city.

This will mean a larger pressure on the city centre and its facilities and thus it may also lead to new centralities in the city. What also can be concluded is that the city of Delft will change so much in the coming five to ten years, that interim use on the Calvé site can be justified. By developing the site later, it can play into the then current needs of the city better.
3.3 Environmental risks of the DSM factory

With the DSM factory come some risks, even though it is shrinking. It has for instance a high risk profile. This can be seen on the ‘Risicokaart Zuid Holland’, the map on which all environmental risks in the province South-Holland are shown. (Provincie Zuid Holland, 2008). Information supplied by Kristel Aalbers, a teacher at the faculty of architecture and former urban designer of the municipality Delft, has shown some other environmental risks. There is a problem with the smell, but mainly the noise zones.

In the MER (environmental assessment) of Rijswijk Zuid (Drujif, 2007), this problem seems to be dealt with by restricting noise sensitive to be build along the DSM site. As the excursion further on will show, the neighbouring Agatha housing estate seems to offer an attractive living-quality in spite of the neighbouring factory. At the first reconnaissance, a high sound barrier seems to make this possible. Again, this may be seen as reason to wait with a ‘formal’ development of the site and to allow for interim use, which can also act as a catalyst for development. A similar process can be seen at the NDSM-wharf in Amsterdam. (Van der Kooij, 2008c)
3.4 Infrastructure around the site.

Another complicating aspect of the site is the railway tunnel that is going to be built in Delft. The building will start in 2009 and the first trains are scheduled to go through this tunnel in 2013. As the railway-viaduct through Delft is demolished, two extra tracks will be built to the tunnel, which will mean another 4 years of tunnel building. Construction, however will not be complete in 2017. The last dwellings to be build are to be finished in 2020. Spoorzone bv., the enterprise that coordinates this project, also shows that the tunnel starts at the Calvé/DSM site. As shown in figure 3.7, the tunnel will be fully underground from the Ruys the Berenbruckstraat.

This will mean the Bacinol building will have to be demolished as it is not recognised as a monument. Other monuments, such as the historic mill and part of the former city wall on the Phoenixstraat are spared. (Spoorzone BV. 2008a) This can be seen in the image above. The current municipal plan for the Spoorzone can be found in attachment 1.

The developments to do with DSM are not clear yet, they now use the tracks for transport. Although not totally dependent on these tracks, it does mean a the location becomes less attractive to the company.
There are also some drawbacks concerning the existing infrastructure. As can be seen in figure 3.8, the Wateringseweg along Loods Friso is for instance very narrow and leaves little space for the cyclist and pedestrian. To top this the waterside is used for parking, making it very unattractive.

Besides that the bridge to that road is a national monument. It can be seen in figure 3.9. This means that it cannot be altered or expanded. All monuments in the surroundings can be found in attachment 1. The new bridge in figure 3.10, is also quite narrow and offers little space to the pedestrian or cyclist.

The exact location of all the pictures in this and the following paragraphs can be found in attachment 1 of this report.
3.5 Buildings and neighbourhoods around the site

The images in this and the next two paragraphs are discussed from left to right, top to bottom. It starts at the north, where the street named ‘t Haantje is found. Historically this was a place where people went to relax. Now it is located at the back of Delft and the DSM factory. The houses along the street are of varying quality and age. They can be characterised as old farmhouses with barns, row houses and townhouses.

East of the site there is a company grounds. A large transport company named Van der Lee is situated there due to the proximity to the highway. It has an attractive facade towards the canal as figure 3.12 demonstrates. Furthermore some small scale enterprises, some amenities and a school can be found in the area. The ROC Mondriaan College (regional training centre Mondriaan College) is to be rebuild and renovated in the coming years.

Southeast of the site there are a lot of municipal monuments as can be seen in attachment 1. Figure 3.13 shows one of the monumental town houses. At the moment they are hidden from the canal by the houseboats, trees and shrubs there. Figure 3.8 made that clear, the houses on the right side of the canal cannot be seen. It may be interesting to create a front towards the canal.

To the south a small park can be found named the Kalverbos. There are some opportunities here to connect the site to the inner-city of Delft. For instance the run down electricity building, seen in figure 3.14, can be removed. There is also a chance to run a route between the old water tower and its pump house. This looks like a dwelling but in fact it houses pumps.

The inner-city of Delft is located to the south of the area. The nearness of the location to the inner-city is a great strength and it can profit from its amenities. Vice versa the site can also add amenities to the inner city of Delft.

To the southwest of the site the Agneta housing estate can be found. This is also a national monument. As was suggested before in this chapter, in spite of the hazards posed by DSM, the Agneta housing estate is a very attractive neighbourhood. Although the image of industry is always present, it cannot be considered very disturbing. As the image shows, the Agneta housing estate is a very nice example of social housing introduced for the factory workers in Delft at the end of the 19th century.

Concluded can be, that the neighbouring areas are of high quality and that there are chances to take advantage of this. However it should be taken into account that many buildings are national or municipal monuments, this can be found in the attachment 1.
Fig. 3.12 East: Company grounds
Fig. 3.13 Southeast: Town houses
Fig. 3.14 South: Electricity building
Fig. 3.15 South: Pass between water tower and pump
Fig. 3.16 South: Amenities inner-city Delft
Fig. 3.17 Southwest: Agneta housing estate
3.6 Green space around the site

As can be seen in figure 3.18 the area around Rijswijk’s water tower is a small park. Again the location of the photos can be seen in attachment 1. It is at the north-eastern corner of the site and houses a playground for children.

A bit further north is the Elsenburger park. This is now part of a rural area between Delft and Rijswijk. It contains many attractive monumental barns and mansions. This area is not in the zoning plan Rijswijk South and will remain as it is. There is a chance to connect this area via the park around the water tower the site.

To the east the design location is bordered by the Vliet, which is shown in the next paragraph. South of the site there is a small park, named the Kalverbos with features such as the monumental stone bank in figure 3.20. There are some more monuments as can be seen in attachment 1. The are some monumental graves as well, which are national monuments.

This presents the opportunity to connect the site via the Kalverbos to the Nieuwe Plantage, an area north of the inner city. The route can run all the way to the Delftse Hout, shown in figure 3.22.

The last image shows the Agneta park. This idyllic area belongs to the Agneta housing estate which was developed for the factory’s workers in the nineteenth century.

The conclusion that can be drawn is that the Calvé / DSM site is a missing link that could connect surrounding green areas in Delft and Rijswijk.
Fig. 3.19 North: Elsburger park

Fig. 3.20 South: Kalverbos

Fig. 3.21 Southeast: Nieuwe Plantage

Fig. 3.22 Southeast: Delfse Hout

Fig. 3.23 Southwest: Agneta Park
3.7 Water around the site

There is a lot of water around the site which is now a physical border, but it offers great qualities. It provides for recreational purposes and scenic views.

Again north of the site there is again the ’t Haantje, a promenade in past time. It is still very attractive and used for boating, as it is the entrance to the polder by boat. This canal runs to the Vliet to the east of the design location.

The Vliet connects The Hague and Rotterdam and is used for recreation and shipping. Although the quality of the promenade is not much good, a lot of people take strolls here. By developing it, it can become even more attractive.

Southeast of the site there is a former harbour. Now some houseboats are anchored there. This can also be seen as evidence that the smell and noise disturbance is not that severe. This is now the back of the Kalverbos and could present itself as a new entrance to the site, connecting it to the inner city.

South of the site is the inner city with its canals. In figure 3.28 a picture of the Oude Delft. This canal used to be connected to the Vliet so ships could enter the town and pass through. Nowadays there are few ships, except for the canal cruises, which make a lap through the inner city and exit to the south to the Schie canal. By re-connecting the Oude Delft to the Vliet, the new access will add to the liveliness of the inner city. The connection to developments on the Calvé/DSM site can add to the recreational quality of the water system in Delft.

Concluding it can be said that the water system holds a lot of opportunities. However, the orientation of public space along the water should be improved. It should also present more value of use. This can be done by connecting the split water systems.
3.8 Conclusion

This analysis is the result of a both deductive and inductive approach. Deductive in the sense that plans were studied, by the municipality and private parties. It has shown the potential of the site as a knowledge district, connected to other knowledge districts in the region and the central location between Rotterdam and The Hague.

This analysis has also shown the enormous growth which is planned by both Delft and Rijswijk. The Calvé/DSM site can play an important role in the development of the area between these two cities. It is the ‘bridge’ from Rijswijk’s southern border to the inner-city of Delft.

From examining the MER (environmental assessment) of Rijswijk Zuid was learnt that there are some restrictions to developing the site. The smell and noise zones around DSM pose a problem, but one that can be solved according to the makers of the MER.

The inductive approach has shown the quality around the site. It is clear that there are a lot of strong points around the site. The location is very central, close to the inner-city. It could connect surrounding green spaces. And the waterfront can be developed into a spectacular promenade. There is also a chance to integrate waterways and add to the value of use.

The analysis has shown that the location is central and that there are possibilities to weave it into the surroundings. The location can benefit from these surroundings, but also offer new qualities in return. The results of this meso scale analysis are used in chapter 8 to improve the initial models.
4. Micro scale analysis

4.1 Introduction

The micro scale analysis is to show that the location is appropriate and available. This chapter is a short summary of the Atlas Calvé/DSM (Van der Kooij, 2008d) which was finished at the P3 in October 2008. It is the collection of all the available information on the buildings at the Calvé/DSM site.

Unfortunately, the author did not receive any assistance from Calvé nor DSM. Therefore all information comes from secondary sources. Based on photos the (floor)height of the buildings was estimated resulting in the 3D model in figure 4.1. More precise information can be found in the Atlas Calvé/DSM.

In this chapter first the size and use of the buildings on the location is shown. Furthermore the potential for re-use, that was estimated in the Atlas, is shown.
4.2 Size location and use buildings

First of all, the size of the total design location is 16 ha, which is about as large as half the TU Delft district. The map shows that Calvé shared the location with DSM. Now the Calvé factory has been abandoned and production has been moved to Rotterdam.

The DSM site has been partly abandoned. Some 50% of the buildings are currently out of use. (Spuiman, 2008) Buildings that are confirmed abandoned and in use at the DSM site are shown in the map. It is known that DSM still produces yeast at the site in the factory coloured green. (Hulshof, 2008) The most southern building is Bacinol, now in use as office space for the creative economy in Delft.
Fig. 4.2 Size location and use buildings. Scale 1:5000
### 4.3 Potential for re-use

In the Atlas Calvé/DSM (Van der Kooij, 2008d) all buildings have been documented with photographs. This resulted in factsheets, like the one shown in figure 4.3.

Based on these factsheets the potential for re-use was estimated. This is shown in figure 4.6. Loods Friso is a building which is estimated to have a high potential for re-use. It possesses both architectural and spatial quality.
Fig. 4.3 Fact sheet loods Friso from Atlas Calvé/DSM
The second building, the Levensmiddelgebouw, is an example of a building with medium potential for re-use. The building is interesting to use because of the space it offers, but does not have a high architectural value.

The third building is only known as ‘building 3’. This is because of the count in the atlas. It is a building which was built in recent years and has only a low potential for re-use. It is a metal hall which is architecturally uninteresting and offers only limited space.

Based on the photographic material of all the buildings in the Atlas the potential for re-use of the buildings was estimated. It is summarised in the map in figure 4.6.
4.3 Conclusion: Potential for re-use

This map shows the potential for re-use of the single buildings based on the work presented in the Atlas Calvé /DSM. A grown insight, based on the design work in this report, has led to some small alterations in this map. There are now some buildings which are thought to have a higher potential than first estimated.

There are three scales: High, medium and low potential for re-use. The examples in this chapter illustrate the architectural and spatial quality the buildings offer in those categories.

Buildings on the south and eastern edge of the DSM site all have architectural and spatial quality. This is the facade to the city and in the past the factory found it important to have a representative front. Calvé also had this representative front, but it has already been demolished.

The buildings with a high potential should be used in the final plan. Most of them are also monuments and cannot be demolished. The buildings with a medium potential can be used for a limited amount of time, but no long term usage is expected. The low potential buildings could be used for a limited amount of time as well.
5.1 Introduction

The goal of this project is to design a socially sustainable creative district through self-organisation. The research finished at the P2 in June 2008 was used to formulate the design criteria which are summarised in this chapter. These can be found in the thesis plan (Van der Kooij, 2008b) and the two papers ‘Reviewing Strijp S and the NDSM-wharf’ (Van der Kooij 2008a) and ‘From low-level rules to higher level sophistication’. (Van der Kooij 2008c)

5.2 Design criteria in the thesis plan

In the thesis plan two sets of criteria can be found. First the graduation objectives were defined that kickstarted the graduation project. Based on common sense these were part of the frame for this graduation. All of them have proven to be true through research. The second set of criteria is based on the paper ‘Delft: a knowledge city paradox’ (Fernandez-Maldonado 2008: 17). As the title suggests it holds recommendations for the improvement of the knowledge city Delft.

The first set of design criteria found in chapter 3 of the thesis plan ‘Field of graduation objectives’ (Van der Kooij, 2008a:18):

- Regional access to the site
- Enable self-organisation
- Mixing working, living and leisure at the scale of the plan area.
- Social mixing at the scale of the city, integrate district in the city

The second set of criteria was discussed in chapter ‘Relevance’ of the thesis plan. (Van der Kooij, 2008b:36,37) They come from the paper ‘Delft: A knowledge city paradox’ (Fernandez-Maldonado 2008: 17) an are recommendations for changes in Delft:

- Adjust housing stock in the social housing segment and the free market segment. Supply two strategic groups: recently graduated students and foreign knowledge workers. Create inner-city environments for lower income groups and knowledge workers in artistic fields such as architecture and design. The author of this report interprets this as mixed use environments. (Fernandez-Maldonado 2008:12)
- Upgrading buzz related amenities in the city centre and TU campus. In order to make Delft a more attractive and lively city, the city should encourage cultural amenities and stimulate private sector initiatives to create third places. These are places where people meet informally outside of work and outside of home. Third place will be interpreted as leisure in the rest of this report.

5.3 Design criteria from the two papers

The two papers are about self-organisation. The first ‘Reviewing Strijp S and the NDSM-wharf’ (Van der Kooij 2008a) demonstrates the relation between knowledge economy and self-organisation. Research by the RPB (Netherlands institute for spatial research) has shown that successful business locations cannot be planned through directive planning anymore as was the case in the 20th century. Nowadays they can only
be supplied with by creating the right spatial conditions for success. The functional demand can be described by the need for a more stimulating and dynamic milieu in which actors are more free to execute their ideas. (Gordijn et al, 2003)

These are characteristics which also apply to ‘land-in-between’, an informal milieu organised by its users. By studying Strijp S in Eindhoven and the NDSM wharf in Amsterdam it was determined that a creative milieu should offer similar potentials. These two cases can be considered ‘flagships’ in spatial-functional developments in the Netherlands. The design for the creative district in this project should therefore also offer these potentials (Frijters et al, 2004):

- The district offers space. Because no end-result is defined and uses have not been planned in detail, it has a large capacity to absorb.
- The district is sustainable and resilient. It is the product of gradual developments instead of a master plan that has the intention to change the site all at once.
- The district shows the possibilities of self-organisation. Where governmental authorities look the other way, developments are left to others. The users and inhabitants take the opportunity to contribute to their own environment. They can react to local circumstances within a small time which contributes to the flexibility of the site.

The second paper ‘From low-level rules to higher level sophistication’ (Van der Kooij 2008b) specifies the spatial preconditions to enable self-organisation of an urban district in the Netherlands. These are the result of the work of Van Dorst (2005) and Salingaros (2000). Salingaros abstracts the city as a network made up out of nodes, connections and hierarchy (Salingaros, 1998) Van Dorst views the city from a humanistic standpoint, from the perspective of its people. This presents two extreme concepts of urbanity which were interesting to compare to find preconditions for self-organisation:

- The carrier of the environment should be durable and the build-in elements adaptable to man’s needs, the livability.
- Buildings should allow for the personalization of space. Users should be able to make their own territory readable and the zoning in the dwelling should allow for the interaction between private and public.
- A hybrid zone should be added to buildings to soften the transition form private atmosphere into public space.
- Forces of attraction needed to couple urban elements together are strongest at short distance, this implies creating a compact district, a village in the city.
- A bad organisation between modules can destroy all couplings at the lowest scale, an approximate linearization leads to a clear urban ordering. This implies to create spaces to stay.

5.4 Conclusion

These fourteen design criteria are used in chapters 9 and 10 to perform an evaluation and an ex-ante evaluation of the improved models. They are also used to find four of the matrices’ categories. This is explained in chapter 7 in part 2 of this report after discussing the initial models in chapter 6.
Part 2 - Urban reconnaissance

In this second part of the report the starting points and the potentials are explored. This urban reconnaissance starts with the ideas of the relevant actors and the initial models in chapter 6. Based on these initial models the first matrix is made in chapter 7, showing the different solutions. In this chapter the first matrix is evaluated, which leads to a second improved matrix. This second matrix is used to explain the improved models in chapter 8. These models are the principal element of this design project. Based on them the urban plan is made, presented in part 3 of this report.
6. Initial models

6.1 Introduction

This chapter shows the initiatives that exist in the city Delft. The matrix method, which will be further introduced in the next chapter, lets a designer work with several models. The idea is that “urban planners can play a pivotal role [in urban processes] by mapping out the existing situation, reconnoitring the various starting-points, assessing the margin for potential solutions, and then translating the outcomes of this process into a clear-cut plan.” (Veldhuis, 2003) The existing situation was mapped in chapters 3 and 4. In this chapter the various starting points are reconnoitred.

There are actually two ways in which models for the matrix method can be found. First, one can use a workshop or brain-storm with the clients, experts and future users look as supposed by Veldhuis. One can however also look at past developments to find the driving forces of a design. (Hulsbergen, 2002: 161,162) In this case three models were chosen that reflect the interest of different stakeholders in the city Delft.

The first idea is by Ineke Hulshof, this represents the wish of the Creative Class in Delft. This is the key-group as they are the workers of the knowledge economy. During a workshop at February 20. 2008 about the future of the Creative Class in Delft, she proposed to make an ‘Art factory’ out of the Calvé /DSM site.

The second idea is model is based on past and current developments in Delft. At the moment the TU Delft is transformed into a campus and the business campus Technopolis is being planned. A business campus, that has already been finished is Delft Tech park. It is located next to the TU Delft. This represents the approach the municipality is taking to create a successful knowledge city. The second idea is thus the creation of a fourth campus next to the TU campus, the Delft Tech Park and Technopolis. This will be a ‘Business campus’.

The third idea comes from the workshop series ‘Re-design the City’. The participants come from seven different groups in Delft and can be seen in figure 6.1, on the next page. They are stakeholders from the government, entrepreneurs, education, the creative sector, business, building&living and inhabitants. The result of the workshop thus represents the idea of a broad group of Delfts’s inhabitants. The idea from the workshop, held in the fall of 2007, is to create a ‘Blue Bastion, watercity of the future’.

These ideas are further presented and elaborated in this chapter. Based on these initial models the matrix is drawn up in the next chapter.

6.2 Presenting the ideas

Art Factory

As no drawings were found or presented during the interview with Mrs. Hulshof an reference of a Art factory has been chosen.

The NDSM wharf is considered the focus point of Amsterdam’s creative economy. It is the counterpart of
the South-axis being developed, the business centre of Amsterdam and the Netherlands. (Gemeente Amsterdam Noord, 2008) This case can be regarded as one of two ‘flagships’ in spatial-functional developments in the Netherlands. (Van der Kooij, 2008c)

All available space of the former shipyard is used as space is scarce inside the highway ring of Amsterdam. The focus is on temporary use. The interior of the ship wharf is considered as covered outdoor space with self-built workspaces constructed in a steel framework. The hall also houses a theatre, event hall and exhibitions. The site also holds some temporary student housing. Containers have been transformed into student housing and are placed there for a limited number of years.

What is also interesting is that the users personalise their surroundings. They built ateliers under the ship ramps and the restaurant Noorderlicht for instance. The entire plan is a private initiative by the group Kinetisch Noord. (Van der Kooij, 2008a)

Business Campus
The business campus is modelled after the completed Delft Tech Park next to the TU Delft campus. It is a small business campus, located south of TNO, at the highway exit. The layout of the plan is quite simple: A cul de sac gives entrance to the site and the distribution of the plots has been done as efficiently as possible. An analysis can be found in attachment 2. A major theme that can be recognised in the aerial photo to the right is parking. It is all done on the individual plots of the offices. This district is a private initiative and most of the buildings are private initiatives of businesses building their offices here.

Blue bastion, watercity of the future
This is the result of the workshop ‘Redesign the city’ for the southern part of the design location. The idea has been to develop a water city here, a reaction to the inner-city of Delft which is also a water city. By flooding the site people can live in floating houses at the site. The islands with the old industrial buildings are to be used as office space for the Creative class. The red blocks on these buildings indicate are pavilions for artists. (Jacobs, 2008)

6.3 Initial models
These initial models are the basic ideas elaborated for the entire design location. The situation has been set as if it were 2030: The railway tunnel is built, trainstation ’t Haantje has been opened, tram 17 and the Stedenbaan are in service. For this situation the three models are made.
Fig. 6.2 NDSM wharf Amsterdam

Fig. 6.3 Aerial photo Delft Tech Park, at the top is TNO

Fig. 6.4 Map from Redesigning the City: Wateringsevest
Fig. 6.5 Art factory 1:5000
Art Factory
This plan uses the industrial legacy as a durable structure. The concept is to use the site as it is found. The plan shows that no new streets are built. The factory entrances and the existing paving are used, creating a shared space for all participants in traffic.

Section 6.6 shows that functions are mixed within the buildings. People work in self-built workspaces in the former production hall. The next section shows container housing for students. These two solutions are repeated several times on the site. The last section depicts the moved Bacinol. Now used as office space by the Creative Class, it also contains a theatre and a gallery. One of its more prominent users has proposed to move the building to save it from forced demolition. This would settle a financial conflict between the municipality and DSM, save the building and create office space and a parking garage for the construction workers of the tunnel. After this temporary use, the building and parking garage can be used again by Delft’s inhabitants.

Business Campus
On the next two pages the business campus is presented. Offices are built by companies in a campus environment. However this environment can be best characterised as a green parking lot. The district has only one entrance and one central Cul de Sac axis, which leads to the offices’ parking lots.
Main axis
high-rise office area
Green hill main axis
Main axis

Fig. 6.9 Campus district 1:5000

New buildings
Old buildings re-used
Figure 6.9 shows high-rise offices at the end of this central axis. In the loop at the end of the axis, a grassed hill served as the public space of the district. Sections 6.10 and 6.11 portray the central axis with parking lots next to it.
Fig. 6.12 Blue Bastion, watercity of the future 1:5000
Blue bastion, watercity of the future

The site is excavated to form an artificial lake with piers to dock the floating houses on. The public space is a harbour for floating houses, consisting of water, piers and islands.

The section through the Monier gebouw shows how it is used for working, an atelier has been added to it as it were a parasite. The second section shows a pier with floating houses docked to it. The last section depicts the axis along the railway. This street is the lengthened Phoenixstraat and also acts as a buffer between the railway and the neighbourhood.
6.4 Conclusion

In this chapter the starting points of the three groups of relevant stakeholders were explored. Each model represents one of the stakeholders. The Creative Class of Delft would like to develop the site into an ‘Art factory’. It would use the industrial legacy as a durable structure and adapt the elements to their wishes. The municipality would develop the site into a ‘Business Campus’ with office space for the knowledge-based economy. However this campus would be like a green parking lot. A broad base of Delft’s inhabitants would like to develop the site into a ‘Blue Bastion’. The factory site should be excavated to create a harbour for floating houses.

The principles in these first models serve to make the first matrix in the next chapter. The three principles above characterise the three models and are deciding for the evaluation in the next chapter.
7.1 Introduction

The matrix is used to explain the principles of urban design to stakeholders. In this chapter the principles of the starting points are inserted in a first matrix. Based on the last chapter a table is constructed that holds the different solutions proposed by the groups of stakeholders. This first matrix is evaluated, after which a second matrix is presented. This matrix holds the improvements suggested by the designer, the author of this report.

7.2 Matrix 1: Initial solutions

The solutions in the matrix are shown for different preconditions (the columns), for the three different models (the rows). The first matrix, in figure 7.1 on the next two pages, consists of seven categories. These can be sorted into two groups. On the left page four preconditions are proposed based on the design criteria. On the right page are three categories which are based on the location and themes addressed in the initial models.

The first four preconditions are based on the design criteria, which were introduced in chapter 5. The first is ‘Functional mixing’, the mixing of working, living and leisure. This was addressed in the paper ‘Delft: A Knowledge city paradox’. Such environments are needed to supply an attractive living-environment to two strategic groups of knowledge workers: Recently graduated students and foreign knowledge workers. The second precondition is ‘Integration in the city’ from the graduation objectives. This is a reaction to the current isolation of knowledge districts in Delft. The third category suggests methods to deal with ‘Private initiatives’. In the paper ‘Reviewing Strijp S and the NDSM-wharf’ it was stated that the district should show the possibilities of self-organisation. This precondition is therefore crucial to find a method to use private initiatives of residents wishing to contribute to their (future) neighbourhood. The fourth category is ‘Durable structure’. This is the carrier of the environment in which build-in elements are adaptable to man’s needs, the livability. It is the structure in which the private initiatives are set. This is the first rule proposed in the paper ‘From low-level rules to higher level sophistication’.

The second group of three preconditions are based on issues addressed by the models and the location. The first is ‘Public space’. Every model suggests a very different kind of public space, a choice for one of these concepts should be made. The second precondition is ‘Parking’, which is explicitly seen in the model ‘Business campus’. It is an issue that cannot be ignored by urban designers nowadays. From the location itself comes how to deal with the existing buildings. This is explored in the category ‘Re-use buildings’.

On the next two pages the first matrix is shown. It is based on the design solutions discussed in the previous chapter. The result of the evaluation is also added to this matrix.
<table>
<thead>
<tr>
<th>First Matrix</th>
<th>Functional mixing</th>
<th>Integration in the city</th>
<th>Private initiatives</th>
<th>Durable structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art factory</td>
<td>Mix within buildings</td>
<td>Use of existing factory entrances</td>
<td>Temporary use for urban development</td>
<td>Industrial legacy</td>
</tr>
<tr>
<td>Business Campus</td>
<td>One function: working</td>
<td>Cul de sac loop</td>
<td>Private clients</td>
<td>Cul de sac streets</td>
</tr>
</tbody>
</table>

Fig. 7.1 Matrix 1: Initial solutions with evaluation

Key solution to be changed
<table>
<thead>
<tr>
<th>Public space</th>
<th>Parking</th>
<th>Re-use buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared space</td>
<td>Parking in two central areas</td>
<td>Reusing all</td>
</tr>
<tr>
<td>Green parking lot.</td>
<td>Parking on own plot.</td>
<td>Reusing monuments and office buildings</td>
</tr>
<tr>
<td>Floating houses harbour</td>
<td>Parking on own plot presumably</td>
<td>Reusing monuments and outstanding buildings</td>
</tr>
</tbody>
</table>

- Solution to be changed
- Category to add
- Minor solution to change
A first glance at figure 7.1 should make clear that there are most problems with the second and third model. The ‘Business campus’ and the ‘Blue Bastion’ do not comply to the design criteria very well. Also from a point of common sense, they contain some fundamental flaws. That is what this first evaluation is about: Get rid of solutions that do not fit the design criteria or are unrealistic.

First of all the solutions proposed by the model ‘Art factory’ are interesting as the starting point is the industrial legacy present at the site. However, the name should indicate the key group: the Creative class. Now it seems the key group are artists.

In ‘Business campus’ the concept for the ‘Public space’, shown above, is very unattractive. It is a green car park, with no communal or public space. The plan does not offer any places to stay, although this is very important. Rule 5 proposed in the paper ‘From low-level rules to higher level sophistication’ demands this. This is the key solution to be changed in this model.

Next to this the model proposes a mono-functional district that is poorly integrated in the city. This design proposes one entrance and a cul de sac central axis leading to the parking lots of the privately built offices.

The public space in the model ‘Blue bastion’ should also be changed. The reasoning for it is the wrong way around. The site is dug out and people would live on the water that is created. Public space can in this case be characterised as a harbour for floating houses. This is not very economic, as it asks for a very high investment that should be made back by developing the site with single family houses. This low density does not fit this central location either.

Another drawback of this model is that there is not a complete mix of functions. There are no leisure functions in this design. Also, it proposes two similar solutions as in the model ‘Business campus’. ‘Private clients’ and ‘parking on the own plot’ are proposed in both models. In both of the categories a broader spectrum of solutions can be proposed.

Finally, this evaluation has led to adding an eighth precondition to the matrix. It was found that the site was isolated by the Delftse Vliet, a canal to the east of the site. Therefore solutions should be proposed for bridging it.

The full evaluation of this matrix can be found in attachment 2.
7.4 Matrix 2: Improved solutions

Based on the starting points, this second matrix makes it possible to assess the margin for potential solutions. This is done based on eight preconditions. One category was added based on the evaluation of the first matrix, which had seven categories.

Three solutions for a bridge across the Delftse Vliet are proposed. Above, figure 7.4 shows a bicycle bridge to the Kalverbos. This is proposed in the model ‘Creative factory’, which used to have the name ‘Art factory’. This strengthens the connection between the Calvé / DSM site and the inner city to let both benefit of each other’s amenities. This precondition also presents a reason to think about the context, which was analysed in chapter 3 ‘Meso scale analysis’.

The improvements to the models ‘Business campus’ and ‘Blue Bastion’ are inspired by the location’s context. These principles are shown in figure 7.5. The ‘Business campus’ can become an ‘Urban garden’ that connects parks in the surroundings to each other. This way the district becomes a link between the parks of Delft and Rijswijk. The ‘Blue bastion’ can become a ‘Canal district’ that connects surrounding water ways. The Vliet can be connected to the canals in the inner city of Delft and the new canal to the west of the inner city. By digging canals in the district, the water can be integrated in the district by the orienting public space towards them.

The changes in the category public space are the cause to propose different context related solutions in the matrix. This led to new proposals for the preconditions ‘Integration in the city’, ‘Durable structure’ and ‘Bridge Delftse Vliet’. The four other preconditions offer a spectrum of solutions. For instance in ‘Functional mixing’, a range of solutions to mix working, living and leisure is proposed. Functions can be mixed within buildings, but also in homogenous buildings and zones at the scale of the district. This exemplifies the solutions for the preconditions ‘Private initiatives’, ‘Parking’ and ‘Re-use of buildings’.

The complete second matrix can be seen on the next two pages. The principles are further illustrated in the next chapter.
<table>
<thead>
<tr>
<th>2nd Matrix</th>
<th>Functional mixing</th>
<th>Integration in the city</th>
<th>Private initiatives</th>
<th>Durable structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative factory</td>
<td>Within the buildings</td>
<td>Use of existing factory entrances</td>
<td>Temporary use</td>
<td>Industrial legacy</td>
</tr>
<tr>
<td>Urban garden</td>
<td>Homogenous buildings</td>
<td>Central axis &amp; bicycle access</td>
<td>Collective private clients</td>
<td>Urban courtyards on axis</td>
</tr>
<tr>
<td>Canal district</td>
<td>Zoning</td>
<td>Phoenixstraat axis, Wateringseweg &amp; streets</td>
<td>Private clients</td>
<td>Canals &amp; streets</td>
</tr>
</tbody>
</table>

Fig. 7.6 Matrix 2: Improved solutions
<table>
<thead>
<tr>
<th>Public space</th>
<th>Parking</th>
<th>Bridge Delftse Vliet</th>
<th>Re-use buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared space</td>
<td>Central car parks</td>
<td>To Oude Delft</td>
<td>Reusing all</td>
</tr>
<tr>
<td>Urban garden connects parks</td>
<td>Collective parking garages</td>
<td>To Nieuwe Plantage 1</td>
<td>Reusing monuments and office buildings</td>
</tr>
<tr>
<td>Water oriented public space</td>
<td>On &amp; around own plot</td>
<td>To Brasserskade</td>
<td>Reusing monuments and outstanding buildings</td>
</tr>
</tbody>
</table>

**Diagram Descriptions:**
- **Public Space:**
  - Shared space
  - Urban garden connects parks
  - Water oriented public space

- **Parking:**
  - Central car parks
  - Collective parking garages
  - On & around own plot

- **Bridge Delftse Vliet:**
  - To Oude Delft
  - To Nieuwe Plantage 1
  - To Brasserskade

- **Re-use Buildings:**
  - Reusing all
  - Reusing monuments and office buildings
  - Reusing monuments and outstanding buildings
7.5 Conclusion

Based on the initial models the first matrix was made. It was evaluated, which led to improvements in a second matrix. To this matrix an eighth precondition was added. The category ‘Bridge across the Vliet’ presented the reason to start thinking about the models’ context.

Two new public space concepts were proposed for the models ‘Business campus’ and ‘Blue Bastion’ based on the qualities found in the surroundings. These were presented in the chapter meso scale analysis. This, firstly, led to an ‘Urban garden’ that links the parks of Delft and Rijswijk. Secondly, it resulted in a ‘Canal district’ that is integrated in the water structure surrounding it.

The solutions in the model ‘Art factory’ have not been changed, however the name was changed. The name ‘Creative factory’ confers the intention to create a creative district.

The second matrix is used in the next chapter to explain the design solutions with help of perspectives, plans, sections and perspectives.
8. Improved models

8.1 Introduction

In this chapter the three improved models are discussed and explained.

The first is ‘Creative factory’ and represents the Creative Class in Delft. It uses the industrial legacy as a durable structure. The legacy of buildings, paving and industrial relicts is used as the basis for this plan. This first model is presented in paragraph 6.2.

The second model is the ‘Urban garden’, it represents the municipality Delft. The district is integrated into the green structure of the surroundings and creates a link between the parks of Delft and Rijswijk. This design is discussed in paragraph 6.3.

The third model is the ‘Canal district’, which represents the wish of a broad base of Delft’s inhabitants. It is a water-rich living environment that connects canals in the district to the Vliet, the canals of the inner-city and the new canal west of the inner-city. Paragraph 6.4 shows the role water plays in this district.

These models are discussed by using the pictograms in the matrix. The solutions to the eight preconditions are put next to the images presented in this chapter. To illustrate the models, first a perspective drawing is shown, giving an image of the atmosphere of the design. After this, the solutions for that model are summarised by showing the corresponding row of the matrix. Then the two main building blocks for the plan are presented. First for the existing buildings that are to be re-used, then for the new buildings that will be added. The urban plan following this, gives an overview of the location. This makes the location of the building blocks clear. By zooming into the plan, the reader gets a better view of the plan. The sections are also indicated in this plan and presented on the following pages. The presentation of each model ends with the demonstration of its added value on the intermediate scale, the scale of city and region.
8.2 Creative factory

This model uses the ‘Industrial legacy’ of Calvé and DSM as a durable structure. This means that the inheritance of buildings, paving and industrial relics is used as the basis for this plan. The elements within this structure are adaptable to the needs of new users. The perspective drawing in figure 8.1 exemplifies this concept. It also shows the way public space is shared by the users. This concept depends on social interaction between the different participants to regulate traffic. The NDSM-wharf, the reference for this plan, also shows how traffic space can be shared between different participants. Figure 8.3 also demonstrates how an industrial legacy can be used as a durable structure.
Building blocks

The building blocks for each model are divided in two groups: First a solution is presented to handle the existing buildings, then for the new buildings.

In this model all existing buildings are used temporarily. An example can be found on the site today. Bacino has been renovated to allow a temporary use as office space. This can be seen in figures 8.5 and 8.6. Buildings are made suitable for use for a low investment cost. There are many buildings that can be easily reused, chapter 5 ’Micro scale analysis’ has shown this. An example is the ‘Oude ingangsgebouw’, depicted in figure 8.4.
However there are also buildings with a lower potential for re-use. For the large halls at the site, self-built ateliers are proposed. A durable steel frame is supplied in which ateliers can be build by renters. This reference can be seen above in figures 8.7 and 8.8.

Because there is a lot of free space on the site, con-
Container dwellings can be built to use it more efficiently. These can be nicer than the ones found generally in the Netherlands. This is a reference by the company ‘Containercity’ and houses starters. This manufacturer supplies a modular building system in which containers can be added together. The analyses for these references can be found in attachment 2.
Plan Creative factory
This is the urban plan for the ‘Creative factory’. Here it can be seen that all the buildings are reused and that the large halls have ateliers built inside of them. Also container dwellings have been built in the district.

What also can be seen is that there are two central car parks. These are at the south- and northwestern corners of the district. This map also makes clear that no new roads or streets are built in the district. The existing paving is used, which creates a shared public space. The only intervention is to open existing factory entrances.
Container housing
Self-built workspaces in factory building
Existing factory buildings temporary use
Railway station
Tram station
Existing trees and bushes
Existing fields
New trees and bushes
Street
Existing surfacing
Parking surface
Cycling route
Square

Fig. 8.11 Plan Creative factory 1:5000
Plan Creative factory zoom-in

Here the zoom-in of the plan for the Creative factory is shown. Here the solutions that were discussed can be seen more clearly. The use of the existing paving of indicates the shared public space and the integration in the city. The factory gates are opened and the industrial legacy is used as a durable structure. This includes the use of the existing buildings for temporary use and the use of central car parks.

An addition is the bicycle bridge to the Oude Delft. This connects the Calvé /DSM site to the inner city. This way both districts can benefit better of each other’s amenities. This is demonstrated more clearly at the end of this paragraph. There the added value at the intermediate scale is made clear.

In this plan three sections are shown, which are discussed on the next pages. These show the typical characteristics of the design on a lower scale level. The first shows how self-built ateliers can be build in the large halls. The second section demonstrates the way container dwellings can be applied. The last profile shows the remarkable initiative to move the Bacinol building.
Section Self-built ateliers

This is a section through a factory hall with a medium potential for re-use. This indicates, that it offers space but no architectural quality. The choice was made to propose self-built ateliers to use this space. In this way renters can appropriate the large hall and use it efficiently and cheaply as office space.

This is a form of temporary use. The steel frame offers a durable structure, but as renters leave and new ones settle in, new ateliers will be build. This results in a mix of functions, as the reference for this building block suggests.
Section Container housing

This container housing is based on the building system of the building block by Containercity. They add containers together, making them larger than the standard 6 * 2.40 meters. Up to 4 containers can be added together. The most important feature of this set-up, is that a hybrid zone between private and public was added. The design criteria demand this.

The containers make different uses possible, therefore functions can be mixed within this building envelop. These containers present a form of temporary use. Their life span is not necessarily limited, but generally is because of the low investment cost.

Fig. 8.14 Section Container housing
Section Moved Bacinol

The third profile is of the moved Bacinol building. Now used as temporary office space by the Creative Class, it also contains a theatre and a gallery. One of its more prominent users, Ineke Hulshof, has proposed to move the building to save it from forced demolition. This would settle a financial conflict between the municipality and DSM, save the building and create office space and a parking garage for the construction workers of the tunnel. After this temporary use, the building and parking garage can be again used by Delft’s Creative Class.
Added value intermediate scale
This model adds amenities to the city and region. This is something that can be seen at the Westergasfabriek in Amsterdam as well. The bridge from the Calvé / DSM site to the inner city creates a synergy between the two districts. Amenities in both districts can supplement one another.

The existing tramline 1, the new tramline 17 and the Stedenbaan make a role on a larger scale possible. The trams supply a connection to the city Delft, but also to neighbouring The Hague and The Hague Ypenburg. The Stedenbaan, a high frequency train system, offers a fast connection to Rotterdam and The Hague. The existing train station in Delft is near, but directly north of the site a new train station is opened as well.

This way the district with its amenities supplement both the city Delft and the Southwing of the Randstad.
Fig. 8.17 Added value intermediate scale
The ‘Urban garden’ connects parks in the surroundings to one another. This way the district becomes a link between the parks of Delft and Rijswijk. Figure 8.18 shows a perspective drawing of this public green space. There are three green stitches in the area. This can be seen in the plan that is shown after the building blocks on the next pages. In the zoomed-in plan that follows it, the profiles are indicated. After discussing these, the added value of the district on the intermediate scale is shown.
Building blocks

The building blocks for this model are again divided in two groups: First a proposal is done to handle the existing buildings, then a building block for the new buildings is proposed.

Monuments and office buildings are re-used, but not temporarily as in the previous model. They are renovated as the reference Las Palmas in figures 8.20 and 8.21. This is an example of formal re-use, quite different than the temporary use in the ‘Creative factory’. An example of a building at the Calvé /DSM site that could be renovated in this manner is shown in figure 8.22.
The new buildings in this model will be made by collective private clients, this a way to stimulate private initiatives. The benefit is that money can be saved by building collectively and without a middle person. This leaves money for extras like a parking garage, social housing or amenities. The Vauban district in Freiburg, Germany, is proof that this method can be used to create an entire district.

Figure 8.24 demonstrates the method that was used to do this. The building site is divided into smaller elements, into urban courtyards collected on a main axis. The plots are then divided by the building collectives, that will build their houses and afterwards distribute their gardens.
1. Plots are distributed
2. Plots are bought by the housebuilders
3. Houses are build
4. Gardens are distributed and the urban courtyard is finished.

Fig. 8.24 Creating an urban courtyard

Fig. 8.25 Reference Vauban, main axis
Fig. 8.26 Reference Vauban, urban courtyard
Plan Urban garden
The plan is built up out of urban courtyards on an axis. This is repeated some ten times in the district. This axis does not stop at the end of the district, takes two turns and is connected to the Wateringseweg. This is the road along the Delftse Vliet.

This means there are only two entrances for cars in this model. The focus in this district is on cyclists and pedestrians. For them the site is very accessible and they can use the main axis as a through route. What adds to this is that the district is inserted in the surrounding green structure. This makes cycling and walking more attractive for the residents of this district. This also combines well with the public transport around the site.

In this model Bacinol has been demolished. The chance that this will happen is considerable. Therefore the district will need a new outstanding facade, that replaces Bacinol at the end of the Phoenixstraat. An example could be an office building as that in figure 8.26. It makes an impression, but also approaches the human scale. A terrace for instance is located on the fourth floor of the building. This will promote social interaction between coworkers, but also between them and passers-by on the street.
Fig. 8.27 Plan Urban garden 1:5000
Plan Urban garden zoom-in

In this plan two of the three collective parking garages in the district can be seen. These can be greened parking garages as in figure 8.28. This would fit the character of the district. Also two bicycle bridges are proposed here. One to the Nieuwe Plantage, connecting the middle green stitch to the bank of the Rijn-Schie Canal around the inner-city of Delft. The second bridge to the south connects the green stitch to the Kalverbos and the tram stop. This connects it to the Nieuwe Plantage north of the inner-city and eventually to the Delftse Hout. This green stitch is also connected to the Agneta park on the other side of the railway. The green structure is the value the district adds to the city, it is demonstrated at the end of this paragraph.

Furthermore three sections are indicated in this plan. The first is a section through an urban courtyard, showing the street and gardens. Then a profile of the main axis that connects all these urban courtyards. Last a green stitch, that is crucial to the quality of the district, is shown.
Section Urban courtyard
This is one of the urban courtyards. The collectively built blocks have a hybrid zone to the back and to the front, to soften the transition from private into public. The courtyard itself is a communal space, it adds an extra zone to go through before going onto the public main axis. Between the buildings of the courtyard, people can opt for a private or communal garden. In the section a communal garden is proposed.

The buildings in this model only have one function, which at the scale of the district leads to a mix.
Hybrid zone

Communal garden
Section Main axis

The main axis has been made to suit slow traffic. First of all because it is not suited for through car traffic. It is also impossible to overtake, because of the small central reservation. The cyclist and pedestrian however, have a lot of space. The plan in figure 8.27 already made clear, that they are the primary users in traffic.

That plan also showed, that this axis is an approximate linearization. The reason for this is, that places to stay should be created. This is further strengthened by the buildings hanging over the pavement. As the section and figure 8.25 show, the axis is divided into segments. This makes the urban courtyards recognisable from the main street and creates places to stay on the axis.
Section Green stitch

This section shows the green stitch, flanked by homogenous buildings built by collective private clients. Between the public space and the private atmosphere, a hybrid zone is created. This creates a transitional zone which lets residents control their privacy.

The green stitch is part of a green structure connecting surrounding green spaces. This is illustrated on the next page.
Added value intermediate scale

The green environment of the district can play a role on the intermediate scale. The Urban garden connects the parks of Delft and Rijswijk. The Elsburger park, which is part of the rural urban area Rijswijk South and can be linked to parks in Delft. The Agneta park, the Nieuwe Plantage, the promenade along the Rijn-Schie canal and the Delftse Hout and the new park on the Phoenixstraat can be connected. This last park is laid out on the newly constructed railway tunnel. This can be seen in attachment 1.
Fig. 8.34 Added value intermediate scale: Urban garden connects parks
8.4 Canal district

The goal of the ‘Canal district’ is to create a water-rich living environment. This is done by connecting to surrounding water ways and by digging canals in the district. Moreover water can be integrated in the district by the orienting public space towards it. The perspective drawing in figure 8.35 illustrates this. The location of it can be seen in figure 8.45.

Above the row from the model that corresponds to this model is shown again. It is used to once more explain the principles of the urban design in this paragraph.
Building blocks
There are again two kinds of building blocks: For the existing buildings and for the new buildings. Of the existing buildings monuments and outstanding buildings are used.

An example of that can be seen above. A silo at the site could be transformed into an office. The reference in figures 8.38 and 8.39 demonstrate this possibility.
The references for new buildings stimulate private initiatives. Private clients are motivated to build their own homes, offices and leisure facilities. The building blocks for this are shown on these two pages.

The main idea can be seen above in figure 8.40 and comes from Steigereiland on IJburg. There, houses are built in an urban neighbourhood and in a high density. It is one of two example projects of this kind in the Netherlands.

One of the strips can be seen in image 8.41. The interesting thing is, that a hierarchy can be discovered. The inner streets are communal and belong to the residents. The side streets are more public and thus less communal. The public street borders the neighbour-
hood and integrates it into the district. These public streets are of all people and therefore have a stronger direction on architectural quality than the inner streets.

As the Canal district is zoned, homogenous buildings are needed to facilitate living, leisure and working. Pavilions are used for leisure, as these can be build by single entrepreneurs. Offices also can be build this way. This is exemplified by the office of CEPEZED in the Phoenixstraat in Delft.

The sketches to these building blocks can be found in attachment 2.
Plan Canal district
Here is the plan which is based on the four building blocks. The monuments and outstanding buildings are re-used and the strips are used to build up the plan. These neighbourhoods are divided from each other by the new canals and the existing harbour. The canals also divide the different zones. The most southern and northern areas are used for working, in the middle living and leisure is found.

The new canals are based on the former canals of the polder. Before the factory was started some 130 years ago, this site was a polder next to Delft. The historic maps in the Atlas (Van der Kooij, 2008d) show the canals perpendicular to the Vliet and the canals of the inner-city. The newly dug canals are connected to existing waterways, adding value to the water network. This can be seen at the end of this paragraph.

The plan also shows how the district is integrated in the city. This is not only through the water network, but also through the network of streets. The main elements are the lengthened Phoenixstraat to the west and the Wateringseweg to the east of the district. From these two streets the district is accessed through side-streets.

In this model Bacinol has been demolished. The chance that this will happen is considerable. Therefore the district will need a new outstanding facade, that replaces Bacinol at the end of the Phoenixstraat. An example could be an office building as that in figure 8.44.

Plan Canal district zoom-in
Fig. 8.45 Plan Canal district 1:5000
A new bridge for cars from the Nieuwe Plantage to the Wateringseweg is proposed. This intervention makes the side of the canal usable, as was demonstrated in the perspective drawing in the beginning of this paragraph.

Also a bicycle bridge to the Brasserskade is proposed, making the Hague Ypenburg and Nootdorp easy to reach. This bridge means that the station Rijswijk South is the closest station for the residents of the western part of Ypenburg. This becomes clear in the added value of the district at the end of this paragraph.

In this zoomed-in plan the durable structure of the district becomes more visible. It is made up out of the streets and the canals. In this durable structures the buildings are adaptable to man’s needs.

Four sections show the quality of the plan, they are indicated in the map. First a section of the main axis through the business zone. Then two sections in the residential zone. First a section through the canal street, followed by a section of an interior street of a strip. The last section is in the leisure zone, illustrating the pavilions as a private initiative.
Section Main axis

Here is the section of the main axis in one of the two business zones. The offices are built by private clients. They also take care of their individual parking need, by creating car parks on and around their own plot. Important is that in front of the offices a hybrid zone is created.

A buffer zone is also created between the main road and the railway. This is done because it is not clear how many tracks will be build. The plans for the tunnel and tracks have not been made public yet. At the start of this project these developments were taken as context of the design. This means it is not designed.
Section Canal street
This and the next profile depict a neighbourhood in the residential zone, based on the reference Steigereiland on IJburg.

Here the street on the canal can be seen, with public space oriented to the water. This cul-de-sac canal is the border between two neighbourhoods. A reed bed is needed to keep the water in the canal clean. This means people need a pier to moor their boats.

The result is that every resident is responsible for a small part of the canal. Everyone has two ‘gardens’: A doorstep and a pier.
Section interior street
This is the interior street of a neighbourhood. This is a communal street for the people who live in and around it. People park their car on their own plots, so there is room enough for kids to play.

Based on the reference Steigereiland, the houses in this street are detached. This creates a mix of town houses and bungalows in the neighbourhood.
Section Leisure square

In this section pavilions of entrepreneurs are shown as private initiatives. The existing buildings are also used for leisure, this can be seen on the right in the section.

This is the leisure zone in which a square is designed as a space where people can meet. One of the demands from the design criteria is to supply more buzz-related amenities. In the Canal district, this is the place to find these amenities.
Added Value intermediate scale

The plan is integrated into the water structure of the city Delft. A connection is made to the Spoorsingel on the east of the inner-city so the Buitenwatersloot can be reached. This is possible as the current plan for the Phoenixstraat proposes to re-dig the Spoorsingel. Residents of the Buitenwatersloot have boats, which they use for recreation. This in contrast to residents of the inner-city, there are only some canal cruise ships that navigate the canals.

By connecting the Vliet to the inner city again, the canals can be made navigable again. The changes in the water structure also add value to the development of the Schie banks, to the south of the inner city. In fact these connections open up the possibility for a total change of the experience of Delft as a water city.

Not just the water network adds to the attractiveness of the city. The lengthened Phoenixstraat and the new bridge across the Vliet to the Nieuwe Plantage integrate the new district in the city. This improves the connection of the Canal district to the city, so both can benefit of each others amenities.

The new bicycle bridge to the Brasserskade opens up possibilities for the new train station: The Hague Ypenburg and the ROC school get an increased accessibility on the regional scale. Also Nootdorp, a town some 3 km to the northeast, can be reached without taking any turns. This increased accessibility also strengthens the meaning of the railway station.

The conclusion is that the infrastructure and the water structure in this model offer Delft great opportunities. The infrastructure makes the district central and creates a synergy with the inner city of Delft. This synergy is strong, mainly because of the development of an integrated water structure.
Fig. 8.52 Added value city and region
8.5 Conclusion

This chapter has shown that it is possible to use this matrix method, that simple solutions make a more complex total design. All three models have certain qualities. The matrix method makes it possible for the author, but also for stakeholders to choose from these different solutions. It makes the design transparent for others.

These choices are made in chapter 9 through evaluation.
Part 3 - Urban plan

In the next chapter this choice is made through evaluation of the matrix. This leads to preliminary preferential scenarios. Then these scenarios are evaluated by an ex-ante evaluation. This is an evaluation based on design criteria and criteria relevant to the design. This gives a view of the value of the project in the three topics of the graduation project: Knowledge city, social sustainability and Self-organisation. This evaluation leads to improvements in the elaborated plan. This is presented in chapter 11.
9. Preferential model

9.1 Introduction

In this chapter a choice is made from the models that were presented in chapter 8 ‘Improved models’. Here, the preferential scenarios are presented before elaborating these in chapter 11. By making a provisional choice in this chapter, an ex-ante evaluation can be done in chapter 10 that can either confirm or refute these decision. It can also lead to improvements to the elaborated urban plan.

Four topics are dealt with in this chapter. Paragraph 9.2 shows an opportunity for the phasing of the plan, as the design criteria dictate a gradual development of the district. After evaluating the second matrix in paragraph 9.3, a third matrix is proposed in paragraph 9.4. This paragraph presents a matrix, that shows the phasing for the development of the district. Following it, the three phases are illustrated together with the main principles. The plans for 2009, 2020 and 2030 demonstrate the development that can take place on the Calvé /DSM factory site.

The chapter ends with the conclusion in paragraph 9.6.
9.2 Opportunity for phasing

In the paper ‘Reviewing Strijp S and the NDSM-wharf’ (Van der Kooij 2008a) a relation between the knowledge economy and self-organisation was demonstrated. This paper has led to the formulation of three design criteria for this project, of which two are relevant for defining the preferential scenarios in this chapter. The second can be found in paragraph 9.4, the first below:

- The district is sustainable and resilient. It is the product of gradual developments instead of a master plan that has the intention to change the site all at once. This implies that a plan for the phased development of the district should be created. The site holds opportunities for this, that were found by studying it. The trend, discussed in paragraph 2.3 ‘Micro problem’, shows that DSM will probably seize its industrial production in Delft in the future. This process can be seen on the site east of the railway tracks, which is this project’s design location. The Atlas (Van der Kooij 2008d) has already shown the demolition of old buildings in recent years. Paragraph 4.2 showed that the Calvé factory and some 50% of DSM’s buildings have been abandoned. This leads to the map for 2009 above, the first phase. DSM uses the remaining buildings for production and the harbour and marshalling yard for transportation.

Following the trend at the site, production will be moved away from the old factories on the eastern side of the railway tracks in the future. (Broos, 2007) At this point the marshalling yard and the harbour remain in use, as DSM still produces in its newer factories on the eastern side of the railway. Here also Research & Development (R&D) takes place. This situation could become a reality in ten years, at which point railway station Rijswijk South should also be opened. This leads to phase 2, in circa 2020.

If the trend is followed, industrial production will also be seized on the western side of the railway in the future. This would mean no bulk transport would be required anymore, making the harbour and the railway tracks redundant. Following the trend, DSM could continue their activities in Delft with an emphasis on R&D and related small scale production, taking advantage of the knowledge of the Technical University. This is also proposed in the report ‘Pieken in de
This could become a reality in the years after 2020. For this project the assumption is made that this is the reality in 2030, at which point the Stedenbaan connects the northern area on a regional scale.

9.3 Evaluation second matrix

Above the three key solutions from the second matrix are shown. The evaluation of this second matrix is based on the design criteria in chapter 5. The most important criterion for determining the scenarios in this chapter was named in the last paragraph. It demands a gradual development of the district.

This development is facilitated by the durable structure of the district, within which the elements are adaptable to the needs and wishes of the users. Therefore the most important aspect is to find a good durable structure. The three solutions proposed for this category in the second matrix are depicted above.

From this image, it should be clear that the durable structures of Creative factory and Urban garden have been chosen. The solution ‘Canals and streets’ in the Canal district is not chosen. This solution has a very high investment cost, which puts pressure on the speed of development. The investment must be made back as fast as possible, inhibiting gradual developments.

A choice for ‘Industrial legacy’ and ‘Urban courtyards on an axis’ would mean a considerably smaller investment. This implicates a choice for the two models ‘Creative factory’ and ‘Urban garden’, as the durable structure comes with most of the other design solutions as well. Changing the models must be done with great caution, as it can affect the quality of the design.

The next two pages portray the second matrix, with the result of the evaluation. This evaluation can be found in attachment 3.
<table>
<thead>
<tr>
<th>2nd Matrix</th>
<th>Functional mixing</th>
<th>Integration in the city</th>
<th>Private initiatives</th>
<th>Durable structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative factory</td>
<td>Within the buildings</td>
<td>Use of existing factory entrances</td>
<td>Temporary use</td>
<td>Industrial legacy</td>
</tr>
<tr>
<td>Urban garden</td>
<td>Homogenous buildings</td>
<td>Central axis &amp; bicycle access</td>
<td>Collective private clients</td>
<td>Urban courtyards on axis</td>
</tr>
<tr>
<td>Canal district</td>
<td>Zoning</td>
<td>Phoenixstraat axis, Wateringseweg &amp; streets</td>
<td>Private clients</td>
<td>Canals &amp; streets</td>
</tr>
</tbody>
</table>

Fig. 9.3 Second matrix with conclusions evaluation
<table>
<thead>
<tr>
<th>Public space</th>
<th>Parking</th>
<th>Bridge Delftse Vliet</th>
<th>Re-use buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared space</td>
<td>Central car parks</td>
<td>To Oude Delft</td>
<td>Reusing all</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban garden connects parks</td>
<td>Collective parking garages</td>
<td>Along Delftse Vliet</td>
<td>Reusing monuments and office buildings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To Nieuwe Plantage</td>
<td></td>
</tr>
<tr>
<td>Water oriented public space</td>
<td>On &amp; around own plot</td>
<td>To Brasserskade</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>To Wateringsevest</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Positive or negative aspect to solution

Solution does not comply to design criteria
9.4 Phasing of the plan

The second matrix has shown which solutions meet the design criteria, but it does not show the factor time. This third matrix puts the solutions in a time frame, running from 2009 to 2030.

The plan is to take the Creative factory as a starting point and then to develop it into an Urban garden, with two solutions from the Canal district. This can be done initially by using the ‘industrial legacy’ as a durable structure, which is developed into ‘an axis with urban courtyards’. From the Canal district come water oriented public space, the bicycle bridge to the Brasserskade and the car bridge to the Nieuwe Plantage.

One principal decision has been made: Functional mixing within the buildings. This creates an innercity environment demanded by the two key groups, foreign knowledge workers and recently graduated students. It also helps to make the district more sustainable and resilient. The three plans for 2009, 2020 and 2030 in this chapter show how solutions are implemented on the site.

As has been mentioned in the previous paragraph, by choosing these two durable structures, the other solutions are also chosen. This is what the third matrix shows. In 2009 most solutions come from the Creative factory model. With industrial legacy as a starting point.
point, the existing qualities at the site are re-used: The site is paved, which allows for a shared space concept and a central car park. Next to this all the buildings are used in a temporary way.

In 2020, part of the durable structure of the Urban garden is built, this way the urban courtyards can be build one by one. Every courtyard represents one communal domain on the public axis. The private collective building groups can build their houses and collective parking garages within this structure. Also the first monuments and office buildings are formally renovated, as figures 8.20, 8.21 and 8.22 demonstrated.

This process is continued until in 2030 the entire district is built and renovated. A second important criterion for this development from the paper ‘Reviewing Strijp S and the NDSM wharf’ is:

- The district offers space. Because no end-result is defined and uses have not been planned in detail, it has a large capacity to absorb.

For this reason the process is illustrated with help of the solutions for ‘Durable structure’ and ‘Integration in the city’. These form the context for the building blocks used to develop the location in the models Creative facory and Urban garden.
Phase 1 in 2009

Today, a large part of the site is available. The Calvé factory has been abandoned and some 50% of DSM’s buildings are not in use. At this stage the industrial legacy is used as durable structure. Temporary use of the site is stimulated, self-built ateliers, container housing and re-used industrial buildings characterise the site. The factory entrances are opened, the creative factory becomes part of the city Delft. The question remains whether Bacinol is moved or demolished. Either way, it will become part of the railwayzone’s building site during the next ten years.

Two interventions prepare the site for a further development. First the trees for the central axis are planted. This introduces the next durable structure and gives the trees the chance to grow ten years. Furthermore a new car bridge is built to divert the traffic from the water-side of the district, as can be seen in figure 8.35.
Fig. 9.6 Plan for phase 1 in 2009, scale 1:5000. The sections can be found in paragraph 8.2.
Phase 2 in 2020

At this point two durable structures exist next to each other. The industrial legacy is still used for the the terrain that has recently come available, but part of the axis has also been built. This makes it possible to have the first urban courtyards finished as well, according to the system that was shown in figure 8.24.

Not only the new central street adds to the district’s integration in the city. Two new bicycle bridges across the Vliet have been built as well. The southern bridge integrates the Urban garden into the surrounding green structure. The northern bridge connects it to Ypenburg.

With the new station Rijswijk South opened, this is the closest station for a part of Ypenburg’s residents. Figure 8.52 has demonstrated this. It also means, that a station is now locacted within walking distance of the district. Also the new main station of Delft should be opened, which now has an exit some 250 meters further north.

All these developments start to make this former ‘black spot’ significant at the scale of both city and region.
Fig. 9.8 Plan for phase 2 in 2020, scale 1:5000
Phase 3 in 2030
This is the final vision. With the catelysing effect of the Creative factory, the site is transformed into an Urban garden in 20 years time. This can be done by using the urban courtyards as a building block.

The added value on the intermediate scale is considerable: it combines the value of the Creative factory (figure 8.17) and of the Urban garden (figure 8.34). This means it adds amenities to the city and the Southwing of the Randstad and connects the parks of Delft and Rijswijk.

The district becomes a valuable addition to the Knowledge city Delft: A location where knowledge workers, but also the other inhabitants of the city, live, work and can go out.
Fig. 9.10 Plan for phase 3 in 2030, scale 1:5000. The sections can be found in paragraph 8.3.
9.5 Conclusion

This chapter has shown the conclusion of the design process. The second matrix was evaluated and the principles have been put into a time frame.

This time frame was used to create an initial elaboration of the principles. This is used in the next chapter for an ex-ante evaluation. It shows the value of the design, but also gives pointers for improving the elaborated plan.
10. Ex-ante evaluation

10.1 Introduction

The ex-ante evaluation was discussed in this project’s thesis plan. (Van der Kooij, 2008b: 49) However the ex-ante evaluation as it was described, is not used to choose one of the three models. Nor is it used to evaluate the elaborated plan, as is common. Instead it is used to test the preferential scenarios that came out of the evaluation based on the design criteria. These were described in the previous chapter. By doing this evaluation now, the results can be used to improve the elaborated final plan. In this chapter the method for the evaluation and the results are discussed. The evaluation itself can be found in attachment 3.

10.2 Method and relevant criteria

As has been discussed in the thesis plan, an ex-ante evaluation can be done based on two kinds of criteria: It may compare the quality of the design to the original brief or it may test on aspects which are relevant, but not explicitly stated in the design brief. (Hulsbergen, 2002: 161, 162) This semester design criteria have been formulated for the design of a ‘Socially sustainable creative district through means of self-organisation’. This can be considered the design brief: Based on the research that was done, a design brief was formulated. This brief can be found in chapter 5 ‘Design criteria’.

To find criteria which are relevant, but not explicitly stated, a different approach is used than was described in the thesis plan. Instead of using De Jong’s ‘Object and impact’ diagram to find these criteria, the topics knowledge city and social sustainability are used. This has been decided as the focus in this project has always been on self-organisation. Figure 10.1 shows that the goal was to argue the importance of this concept for the creation of a successful knowledge city and to reach social sustainability. Although all three are relevant topics of the project, the two latter were both secondary topics.

During the graduation the author has come across two interesting researches in these two topics. The first is by fellow student Christiane de Koning (2008). She has also set her graduation project in Delft, but the focus of her work is the Knowledge city Delft. Her research in this matter is therefore much more detailed than...
that in this project. The second is by Machiel van Dorst, who has become a third mentor to this graduation. In his dissertation, Van Dorst (2005) aims to find physical characteristics that contribute to the sustainable character of a livable living-environment. In paragraph 1.4 it was already made clear that Van Dorst’s interpretation for social sustainability is used in this project.

**Relevant criteria Knowledge city**

This part of the evaluation is done based the paper ‘Formal spatial and functional spatial requirements of the knowledge city, Urban planning for the knowledge based economy’ by De Koning. (2008) Based on a literature review she proposes five formal spatial and five functional spatial requirements. The first group deals with the physical elements of the urban design. These are scale, city structure, infrastructure, aesthetic looks and electronic infrastructure. The second group, the functional spatial requirements, concern the amenities and activities within the urban design. It deals with knowledge-based activities, quality of life, urban diversity, meeting points and recreation. The main emphasis is on the latter category.

**Relevant criteria Social Sustainability**

Based on several case-studies, amongst which the Poptahof in Delft and Ruigoord in Amsterdam, Van Dorst (2005: 256, 257) has concluded which physical characteristics add to the sustainable character of a livable living environment. He concludes that this includes aspects that can be divided into two categories: static and dynamic qualities.

Static qualities imply that the physical environment prevents unhealthiness, unsafety, un-livability and nuisances. These are preconditions to which any living-environment should comply. As a rule residents normally cannot influence them nor do they take notice. This static quality is assured by complying to current rules and by solving local problems. This should be fulfilled before any dynamic quality can be added. (Van Dorst, 2005: 256, 257) Three local problems were discussed in chapter 3, the meso scale analysis. A fourth problem has been added: The railway comes above the ground next to the design location and therefore train noise becomes an issue.

Dynamic qualities imply that the sustainable livable living-environment must be changeable. On a small scale, residents should be able to change it, on a larger scale it should be possible to replace buildings or to have available space to add buildings. The living-environment becomes part of residents’ identity, because it allows for the freedom to change the neighbourhood. The living-environment is not only there to live in, but also to work, to relax, to recreate, to care, to shop, to meet, to garden or to just be outside. The presence of people outdoor is a relevant part of the functioning of the neighbourhood. This is not the result of aesthetic aspects, but of physical characteristics in relation to the social environment. Recognisable territories are needed for this, as these provide a readable privacy-zoning. Smaller territories, front gardens for example, are set in larger territories, for instance the street or neighbour- hood and eventually the city. Together these make up a nested system. This means that residents are in
possession of territories, which are recognised as such by other residents and passers-by. This enables every resident to regulate their own social contacts, which should not lead to a social network, but which does make the resident jointly-responsible for their physical and social surroundings. (Van Dorst, 2005: 257)

10.3 Results and recommendations of the ex-ante evaluation

Of the in total 37 criteria, 31 got a positive judgement. Six criteria require special attention in the elaboration of the final plan. Recommendations for this are done in this paragraph.

Self Organisation
The main theme of this graduation project was evaluated on nine design criteria. Eight of these come from the papers that were written by the author in relation to this graduation. One comes from the graduation objectives in the thesis plan. In this theme the criterion ‘Gradual developments’ has led in to a recommendation for the elaborated plan.

To make a gradual development of the district possible, the plan aims to keep investment costs low. This was a main argument for choosing the two durable structures in chapter 8. In phase 3 of the plan, there is an opportunity for improvement. A car bridge is proposed across the harbour. This could also be a bicycle bridge, as the main street stops some 200 meters further. Another argument for this intervention is to keep the main street unsuitable for through car traffic in the future.

Knowledge City
In the theme Knowledge City, there are sixteen criteria, of which one comes from the graduation objectives in the thesis plan and two from the paper ‘Delft: A Knowledge city paradox’. There are two criteria which require attention in the elaboration. These are the criteria ‘Knowledge harbours’ and ‘Regional innovation centre’. These are both focused on the trade of thoughts and implementing ideas. There are several similar initiatives in Delft such as ‘Techniek OntmoetingsPunt’ (Engineering meeting point) in the inner city and ‘De nacht van de kunstfabriek’ (the night of the art factory) in Bacinol. However, more of these initiatives should be promoted to link inhabitants with the knowledge-based economy and spread and implement ideas.

Therefore it is proposed to use part of ‘Het Groot Kantoor’ as a Knowledge harbour and regional innovation centre in the elaborated design. Figure 10.3 illustrates that this building fulfilled a public and representative function in the past. This impressive structure has been granted the status of national monument and has been renovated several years ago. It is not used now and could thus serve as a regional innovation centre and knowledge harbour from the first phase of development. It can be a platform for debates, seminars, theatre- and film shows as offered by ‘De Balie’ in Amsterdam.
Social Sustainability
This theme consists of twelve criteria, two of which come from the graduation objectives in the thesis plan. There are three criteria which have led to recommendations. Two of them are about the noise disturbance by DSM and the railway, the third is about the mixing of functions in the district.

DSM and the railway tracks cause noise disturbance, figure 3.5 and figure A3.3 in the third attachment show this. The noise of the passing trains is most severe. It is unclear what will happen with the railway track, if a tunnel with or without a roof is build, if there will be four tracks. These decisions have not been made yet. (Druijf, 2007: 16; Project Team Plan Studies Spoorn Zuidvleugel, 2008)

A research about the noise disturbance has been carried out as part of the MER for Rijswijk South. It states that problems are preferably dealt with at the source, but that other solutions are possible. It states that if the values cross the preferential values (55dB rail traffic and 50 dB for industry) an exemption should be applied for. If the maximum limiting values (68 dB for rail traffic, 55 dB for industrial noise) are crossed, it is not possible to apply for an exemption. However, by applying a curtain wall or deaf façade (dove gavel), housing is possible. Then, the judicial review by the Wet geluidshinder (Law noise nuisance) can be cancelled. Figures 10.5 and 10.6 show references of these two kinds of facades. (Gort-Krijger, 2008)

The mixing of functions is an initial criterion from the graduation objectives in the thesis plan. It is now supported by criterion 8 from the topic social sustainability, criterion 2 from Knowledge City and criterion 5 from Delft: Knowledge city Paradox. As it is so vital for the success of the district, it is necessary to make a remark here.

Functions will be mixed within the buildings, but this means that these buildings should offer flexibility. The paper ‘Flex-buildings’ by Heijne and Vink(2008) has shown that location and building structure respectively are most difficult to change. Therefore demands to the structure should be made. It should offer an oversize, for example a minimal interior floor height of 3 meters. This way different functions can settle in the building through time.

10.4 Conclusion
The ex-ante evaluation based on the three central themes has shown that the design performs well. It fulfils the design criteria and relevant criteria, based on the themes Knowledge City, social sustainability and self-organisation. The ex-ante evaluation has proven that the design is robust.

It has also yielded recommendations for the elaborated plan. This is improved on four points in the next chapter.
11. Elaborated plan

11.1 Introduction

The contents of this chapter was presented at the final presentation, the P5. The presentation posters for the three phases are added to this report to complete the project.

At the end of attachment three, the buildings north of the Calvé /DSM site are shown. This information is used for the elaborated design.
Phase 1 in 2009

Added value intermediate scale
Addition of amenities to city and region
Connecting parks Delft and Rijswijk

Building blocks: NDSM self-built workspaces and container dwelling tempohousing
Section
Self built ateliers 1:200

Section
Container housing 1:200

Section
Moved Bacinol 1:200
Phase 2 in 2020

Added value intermediate scale
Addition of amenities to city and region
Connecting parks Delft and Rijswijk

Urban courtyard Vauban Freiburg: Collective private initiatives.

1. The building fields are designed with strict and loose building lines.
2. Plots are distributed.
3. Plots are bought by the housebuilders.
4. Houses are build.
5. Gardens are distributed and the urban courtyard is finished.

Vauban neighbourhood

Soester plant of the district

Westergasfabriek Amsterdam Agneta Park Delft

Green parking garage

Rotterdam
Ypenburg
Phase 2 in 2020

Section urban courtyard 1:200

- Urban courtyard

Section
Self built ateliers - Main axis 1:200

- Self built ateliers
- Formal re-use of industrial building
Phase 3 in 2030

Added value intermediate scale
Addition of amenities to city and region
Connecting parks Delft and Rijswijk

Public space along harbour basin and Delftse Vliet

Re-using site as office space
Phase 3 in 2030

| Section | Main Axis | Space Formed | Parking | Recycling & Re-use | Public Space | Private Place
|---------|-----------|--------------|---------|-------------------|--------------|------------------
| 2nd     | 6 m       | 3 m          | 9 m     | 4 m               | 13 m         | 12 m             |
| Matrix  | Functional Mixing | Integration in the city | Private initiatives | Urban garden | Monument & Building | Re-use buildings |
| 2020    | Central axis & bicycle access | Collective private clients | Industrial legacy & Urban courtyards on axis | Urban garden connects parks, Water oriented public space | Reusing all, Reusing monuments and office buildings |

Reference Las Palmas Rotterdam

Main axis, space formed


• Gemeente Delft, 2005. *Bestemmingsplan Technopolis*. [Internet] Available at: http://www.gemeenteedelft.info/gyscriptvkdspage.asp?sessionid=1ZxzY@p5K38HdWziQ12AD5FEo9vlsYlyp7M0aGBJhXOUKeXXXI%WdpD8XHSWf8xG1]&pageid=19&objectid=10393 [Accessed June 8. 2008]
• Gemeente Delft, 2006. Gebiedsvisie Schieoevers [Internet] Available at: http://www.gemeentedelft.info/ gvscriptvkdspage.asp?sessionid=1ZxzY@p5K38HdWziQ!2AD5FEo9sUlsYIlp7MoAG8JhXOUeKEXXlWdpD8XH5Wf8xG1j&pageid=19&objectid=24848 [accessed June 8. 2008]
• Gemeente Delft, 2008. Bestemmingsplan Technopolis. [Internet] Available at: http://www.gemeentedelft.info/ gvscriptvkdspage.asp?sessionid=1UhCp3M4eGxh@OuKEE@iW99yz8@H5lb3BG1jif5WxRDe8Ga59bo5Wz8ZWno7p18&pageid=19&objectid=10386 [accessed June 8. 2008]

H-Z
• Jacobs, G., [interview about workshop Redesign the City] (personal communication April 21. 2008)

- Spuiman, [telephone interview about DSM factory site Delft] (personal communication September 17. 2008)
- Van der Kooij, P.C., 2008b. Living on Crunchy street, redesign the site of the departing Calvé factory in delft as a socially sustainable district [thesis plan for the graduation lab Urban transformation and sustainability] Delft: TU Delft
- Veldhuis, W., 2003, De matrix, een strategie voor stedelijke vernieuwingsplannen. Archis 3: 92-95
- Wilson, M. unknown. The knowledge economy and distressed communities, I: defining the knowledge economy. [internet] Available at: https://www.msu.edu/user/wilsonmm/Smart/KnowledgeEconomy.pdf [Accessed June 8. 2008]
Fig. A1.1 The municipal plan of the railway zone (Spoorzone BV., 2008b)
Green are municipal monument, red are the national monuments

Fig. A1.2 Monuments on and around the location (Gemeente Delft, 2009)
Urban plan location after building the railway tunnel

Scale 1:5000 1cm = 50 m

3.18, 3.19 not on the map
3.21 not on the map
3.16 not on the map

Fig. A1.3 Location of the photos in chapter 3 'Meso scale analysis'
Fig. A2.1 Analysis Delft Tech park
<table>
<thead>
<tr>
<th>Evaluation first matrix</th>
<th>Functional mixing</th>
<th>Integration in the city</th>
<th>Private initiatives</th>
<th>Durable structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art Factory</td>
<td>Mix within buildings</td>
<td>Use of existing factory entrances</td>
<td>Temporary use for urban development</td>
<td>Industrial legacy</td>
</tr>
<tr>
<td></td>
<td>Living, working, leisure mixed within the buildings</td>
<td>The creative factory is well accessible, it has functioned for over a 100 years as a factory already. It is however isolated by the river.</td>
<td>The site can be prepared for a more formal development. This can add to the value of the site.</td>
<td>The entire site is paved and offers numerous spaces to appropriate.</td>
</tr>
<tr>
<td>Business campus</td>
<td>One function: working</td>
<td>Cul de sac loop.</td>
<td>Private clients.</td>
<td>Cul de sac streets.</td>
</tr>
<tr>
<td></td>
<td>There is no mix of functions. Living and leisure should be added to the area.</td>
<td>Only one entrance and exit, bad integration with the city. It is isolated by the river.</td>
<td>Businesses building their own offices and contribute to their environment. However, this is also explored in the model ‘Blue Bastion’.</td>
<td>Cul de Sacs here only lead to parking lots. There is a chance to create a better organisation between modules; To create domains in the district.</td>
</tr>
<tr>
<td></td>
<td>Here leisure is not integrated, it should be added.</td>
<td>The Phoenixstraat is an important axis within the city. The Wateringseweg is re-routed to add quality of stay to the waterside. However the site is isolated by the river.</td>
<td>Private clients build their own house and contribute to their living-environment. However, this is also explored in the model ‘Business campus’.</td>
<td>The reasoning is the wrong way around. It's not economic to flood the site to live on it.</td>
</tr>
</tbody>
</table>

Fig. A2.2 Evaluation Matrix 1

Key solution to be changed
Solution to be changed
<table>
<thead>
<tr>
<th>Public space</th>
<th>Parking</th>
<th>Re-using buildings</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared space</td>
<td>Parking in two central areas</td>
<td>Reusing all</td>
<td>This model departs from the qualities available at the site. However the focus group should clearly be the Creative Class, not artists.</td>
</tr>
<tr>
<td></td>
<td>The parking area to the north is already there. By the moving of the Bacinol building a parking garage is created.</td>
<td>The buildings offer space and have a large capacity to absorb.</td>
<td></td>
</tr>
<tr>
<td>Green parking lot.</td>
<td>Parking on own plot.</td>
<td>Reusing monuments and office buildings</td>
<td>This model especially lacks communal space. It is a green car park with offices built in it.</td>
</tr>
<tr>
<td></td>
<td>As the entire district is divided into plots which are filled up with car parks, no public or communal space is left. There are no places to stay.</td>
<td>The monuments should be re-used. Office buildings are easiest to transform into new functional buildings for living, working and leisure. This is also the case for the Bacinol building at the site.</td>
<td>A radical change of the concept is necessary.</td>
</tr>
<tr>
<td>Floating houses harbour.</td>
<td>Parking on own plot presumably.</td>
<td>Reusing monuments and outstanding buildings</td>
<td>The reasoning for this model is not logical. It is simply not economic to flood the site only to create a low density district. This concept does not fit this central location.</td>
</tr>
<tr>
<td></td>
<td>Common solution, but in a city some more flexibility should be offered.</td>
<td>The monuments should be re-used. Outstanding buildings are chosen to indicate the site former industrial function.</td>
<td></td>
</tr>
</tbody>
</table>

Category to add  Minor solution to change
Fig. A2.3 Reference Creative factory: NDSM wharf
Fig. A2.4 Reference Creative factory: Container housing
Fig. A2.5 Reference Urban garden: Office SAP, (southpoint district but without the parking garage)
Fig. A2.6 Reference Urban garden: Collectively built block Vauban Freiburg Germany. Note how every apartment has a personalised facade & floorplan.
Fig. A2.7 Reference Canal district: Steigereiland IJburg, a strip analysed.
Fig. A2.8 Reference Canal district: Office building CEPEZED by CEPEZED and ‘De Natie’ by META architectuur bureau. Examples of office buildings in a dense urban fabric.
<table>
<thead>
<tr>
<th>Evaluation 2nd matrix</th>
<th>Functional mixing</th>
<th>Integration in the city</th>
<th>Private initiatives</th>
<th>Durable structure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Creative Factory</strong></td>
<td>Mix within buildings</td>
<td>Use of existing factory entrances</td>
<td>Temporary use for urban development</td>
<td>Industrial legacy</td>
</tr>
<tr>
<td></td>
<td>This can create an inner city environment demanded by the two key groups, foreign knowledge workers and recently graduated students. The mix helps to make the district more sustainable and resilient.</td>
<td>The district offers space. It symbolises the potential of self-organisation. It is also a village within the city.</td>
<td>Can create the initial quality of the location and so add to the land-value.</td>
<td>The entire site is paved and offers numerous spaces to appropriate.</td>
</tr>
<tr>
<td><strong>Urban garden</strong></td>
<td>Homogenous buildings</td>
<td>Central axis &amp; bicycle access</td>
<td>Collective private clients.</td>
<td>Urban courtyards on axis.</td>
</tr>
<tr>
<td></td>
<td>Homogenous buildings tend to be not very flexible in use. This would not add much to the sustainability and resilience of the district</td>
<td>This creates a good transition from private into public. It is a village within the city, a domain for its residents, but also accessible for visitors.</td>
<td>Collective initiatives save costs and creates potential for extra qualities such as buzz related amenities and social housing. This could promote social mixing within the city.</td>
<td>This creates a good organisation between the different neighbourhoods in the district. The courtyard softens the transition from the private and communal atmosphere into public space.</td>
</tr>
<tr>
<td><strong>Canal district</strong></td>
<td>Zoning</td>
<td>Phoenixstraat axis, Wateringseweg &amp; streets</td>
<td>Private clients</td>
<td>Canals &amp; streets</td>
</tr>
<tr>
<td></td>
<td>Creates an obstacle for gradual development. This would not add to the sustainability and resilience of the district at all.</td>
<td>The goal is to create a space to stay, a village within the city. The Phoenixstraat is a clear space of flow, a linear element following the railway line.</td>
<td>Private clients are often quite affluent, this would not promote social mixing. The low density of the district would make it even more exclusive.</td>
<td>This creates a good organisation between different neighbourhoods of the district. There is however a problem with gradual development: The investment for the canals is high. This puts pressure on the speed of develop-ment.</td>
</tr>
</tbody>
</table>

**Fig. A3.1 Evaluation Matrix 1**

*Key solution*  
*Positive solution*
<table>
<thead>
<tr>
<th>Public space</th>
<th>Parking</th>
<th>Bridge Delftse Vliet</th>
<th>Re-using buildings</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shared space</strong>&lt;br&gt;The concept of shared space promotes social interaction and is the key to self organisation.</td>
<td>Parking in two central areas&lt;br&gt;The parking area to the north is already there. By the moving of the Bacino building a parking garage is created.</td>
<td>To Noordeinde &amp; Oude Delft&lt;br&gt;This will strengthen the connection to the inner city creating synergy between the two districts. However the purpose of this bridge can also be combined with the bridge to Nieuwe Plantage(1). It is circa 50m east.</td>
<td>Reusing all&lt;br&gt;The buildings offer space and have a large capacity to absorb.</td>
<td>The solutions in this model are interesting for the early phases of development.</td>
</tr>
<tr>
<td><strong>Urban garden connects parks</strong>&lt;br&gt;This offers a chance to integrate the district in the city. It can be developed gradually, making the public space sustainable and resilient.</td>
<td>Collective parking garages&lt;br&gt;Save on space for car parking, made possible through collective developments</td>
<td>To Nieuwe Plantage 1 To Kalverbos&lt;br&gt;The bridge could also be combined with the bridge to Nieuwe Plantage(2). It could combine through traffic and recreational traffic. The bridge to the Kalverbos is a strategic connector between the site, the Nieuwe Plantage and the inner city.</td>
<td>Reusing monuments and office buildings&lt;br&gt;The monuments should be re-used. Office buildings are easiest to transform into new functional buildings for living, working and leisure. This is also the case for the Bacinoil building at the site.</td>
<td>This is the concept to strive for as it fulfils the design criteria best. Furthermore it can be improved with solutions from the other two models. The crucial thing to alter in this model is the concept for functional mixing.</td>
</tr>
<tr>
<td><strong>Water oriented public space</strong>&lt;br&gt;The canals cannot be used as durable structure, but the quality of the waterside available will be improved.</td>
<td>On &amp; around own plot&lt;br&gt;In contrast to the other two solutions, there is no added value to this solution.</td>
<td>To Brorskerskade To Nieuwe Plantage 2&lt;br&gt;The bridge to the Brorskerskade allows for integration with Ypenburg. This second bridge to the Nieuwe Plantage can be combined with the first one. It can be for through traffic and recreational purposes.</td>
<td>Reusing monuments and outstanding buildings&lt;br&gt;The monuments should be re-used. Outstanding buildings are chosen to indicate the site former industrial function.</td>
<td>There are several drawbacks to this model. The main problem is the high cost for the canals. This creates a pressure for a swift development of the site, where as a gradual development is wishful. Also private clients run the risk of creating an exclusive district.</td>
</tr>
</tbody>
</table>

**Solution does not comply to design criteria**

**Positive or negative aspect to solution**

---
A3.2 Ex-ante evaluation

Criteria Knowledge city.

Below the main qualities these ten requirements are summarised based on the paper ‘Formal spatial and functional spatial requirements of the knowledge city’ by De Koning (2008)

Formal spatial requirements

1. Scale: The knowledge-based city is a polycentric network city in which mobility and mobility nodes are key factors.

   The main railway station of Delft is within bicycle distance of the district, which means it is within a radius of 1250 meters. The new station has an exit some 250 meters further north in 2020. Also a new the new station Rijswijk South should be opened in 2020. This will be part of the Stedenbaan, which connects the cities in the South wing of the Randstad. It is a metro-like train system, which means train will stop there in a high frequency. The nearness of these stations, means the district can play a role in the South wing of the Randstad, a polycentric network city.

2. City structure: In the knowledge economy urban areas can have a mixed-use. This means work spaces and houses can be close to each other. Next to that, a clustering of knowledge-based activities is important.

   This is one of the preconditions researched in the matrix. As a result the district will be mixed use. The plan encompasses to start up a knowledge district with help of the Creative factory concept as catalyst. This would result in a clustering of knowledge-based activities.

3. Infrastructure: The network has to facilitate face-to-face contacts, these are important for the knowledge economy. This means a focus on travel by public transport, but also by foot and bicycle.

   There is no through car traffic in the district, in any phase of the plan. The main focus is on bicycle connections and pedestrian routes. This is realistic as the district is connected by train, tram and buss i.e. public transport. Public transport promotes face-to-face contacts as well, as it is a form of collective transport.

4. Aesthetic looks: The appearance of the urban area should stimulate creativity. Post-modern architecture and a mix of old and new buildings are examples of a building style that is suitable for the knowledge city. “By post-modern is understood a style of eclecticism, ready borrowing, and pastiche” (Baum et al., 2007)

   First of all there is a mix of old and new buildings, because of the phasing in the plan. This suggests a mix of old and new buildings in each phase of development. The plan is not about aesthetic characteristics, but it may be assumed that the stimulated private initiatives promote the creation of a style of eclecticism. Also the promotion of self-organisation in the finished plan should stimulate a post-modern style of architecture.

5. Electronic infrastructure: Access to Internet. Not only for knowledge workers, but for all city citizens. The same applies to education, training and services.

   This has not been designed, but it should be a result of integrating the district in the city. The aim is to strive for an inclusive knowledge city.

Functional spatial requirements

6. Knowledge-based activities: the quality, quantity and diversity of activities determine the success of the knowledge city. Can be stimulated with:

   a. Agencies that promote development of the knowledge city. Examples are technology foundations, research centres & institutions, technology park and universities.

   As the chapter ‘Initial models’ has shown, there is an interest from different actors in the city Delft. The Creative Class of Delft tries to actively improve its position. The idea for the DSM site, presented at the forum ‘Creatieve Stenen’, is an example of this. According to Ana-Maria Fernandez-Maldonado “there are a lot of different networks involved [in Knowledge city Delft].” She continues to say that “one of the most important [networks] is the Knowledge City Foundation in Delft, with the main stakeholders (TU, TNO, Gemeente). Until now this foundation is still working but they are the first one to admit that there is not much interest from these stakeholders. The idea of the knowledge city is that the private sector work together with the knowledge sector to enable new companies.” (Astua et al., 2008: 41)

   The top-down policy is not very successful. This means
bottom-up initiatives are very important in this city. The Creative Class was boosted by the Bacino1 building, it is an icon to creativity in the city. It is not only an office building, but also serves as a podium, gallery and meeting place. The space offered in the district can promote the growth of the Creative Class and thus the knowledge economy in Delft.

b. ‘Urban innovation engines’ are needed, these trigger, generate, foster and catalyse innovation. Examples are the university, capital market place, knowledge intensive industrial district and science parks.

   The aim is to create a creative district, which would be an urban innovation engine. Delft also has a university and science parks, so it fulfils this criterion. The problem for Delft however, is that the city does not provide the right kind of housing and living environments that knowledge workers demand. This project addresses this problem.

c. ‘Knowledge harbours’ are needed, to focus on the trade of thoughts. Amenities will be knowledge arenas, research hubs and meeting spaces.

   This is not explicitly available in the district. It may be a good idea to add a podium explicitly for the sharing of knowledge.

7. Quality of life: Cultural activities and amenities play a big role for where knowledge workers want to settle. Although different for different kinds of knowledge workers have different demands, this is universal. They want, next to main amenities, a vibrant and lively city. Some more elaboration in the last three criteria.

   The idea is that the Creative factory-concept functions as a catalyst for the development the creative district. It should stimulate cultural activities and amenities. Several publications support this approach (Haydn, Temel, 2006; Overmeyer et al, 2007). Most interesting is a publication by VROM, the Dutch ministry for public housing, spatial planning and environment. The conclusion of the report ‘De broedplaats als instrument in de stedelijke vernieuwing’ (The breeding-place as instrument in urban renewal) is that:

   “A breeding place can work as a catalyst, help in attracting higher-income groups and innovative economic activities on the scale of the district. At the same time the breeding-place works as an emancipation-machine. The cheap space enables initiatives without the need for risky loans or high threshold procedures, that are needed to start up a business.” (Westerkamp et al., 2004: 89)

8. Urban diversity: “Innovative ideas will be created by people from different cultural and academic backgrounds with different experiences, professions, ages and personalities.” (De Koning, 2008: 12) Urban diversity can be designed by making the area attractive with different amenities for a diverse group of people.

   The aim is to not create an exclusive district, but one that is integrated in the city. This is a criticism to the current developments of the Knowledge city Delft. The site is integrated by infrastructure, but also through the connections in public space. The district is connected to the inner city, adding amenities to it and benefiting of the amenities it offers. Secondly it connects parks of Rijswijk and Delft. These three solutions integrate the district in the city and region, offering attractions for a diverse public and thus promoting urban diversity.

9. Meeting points: Knowledge and ideas are created through exchanges of experiences in face-to-face contacts.

   a. These are also known as third places. Examples are bookstores, bars, hair salons, big urban events, museums and libraries.

   b. And a regional innovation centre, this is an example of an urban innovation engine with some special elements. At the heart of the future centre there are community conversations. Another function is the workshop area with gallery, to create and present new ideas. In the innovation laboratory is nearby ideas are translated into actions. The last aspect is the implementation of projects into the city. This will link inhabitants of the city to the knowledge-based institutes.

   There are several similar initiatives in Delft, such as ‘Techniek OntmoetingsPunt’ (Engineering meeting point) and ‘De nacht van de kunsfabriek’ (night of the art factory). These are initiatives of Delft’s Creative Class and raise sympathy with Delft’s inhabitants. However, such initiatives should
be promoted more to link the inhabitants with the knowledge-based economy.

10. Recreation: Different amenities are necessary to create a vibrant life. There are constructed amenities, like cafés and universities, and natural amenities, like water access and topographic variation. There should be a good balance between these two, between creative energy and the mind retreat.

Assuming the Creative factory works as a catalyst, as was described in ‘7. Quality of life’, a vibrant district should come into being. When the district is developed into an Urban garden the green space in the district and the green space to which it connects, should balance this vibrancy with a ‘mind retreat’.

Criteria Social sustainability

Static qualities:
1. Figure 3.4 shows the smell zones around the DSM factory present a smell nuisance.

“The permitted contour within which DSM can cause severe [smell] nuisance has been set to 5 g/m3 as 98-percentiel. This contour is within the borders of DSM’s terrain. For DSM has, by decree of the province, been determined that by a smell impact of 1 g/m3 as 98-percentile nuisance can appear. Within this derived contour is a large part of Delft’s inner city, her 19th century expansions and for a part the area Rijswijk South. From a relative point of view the increase of people who are caused an inconvenience is limited and within the contour acceptable.” (Druijf, 2007: 48)

To summarise this section from the MER (Milieu Effect Reportage, Environmental Effect Report in English) for Rijswijk South: Smell nuisance can occur, but other parts of Delft and also Rijswijk South are also caused inconvenience. This however, is acceptable.

2. Figure 3.5 shows the noise zones around DSM, this presents restrictions for new buildings.

The noise disturbance by DSM is relatively little when compared to the noise disturbance caused by passing trains. Thus the evaluation of the criterion ‘4. Noise disturbance caused by passing trains’ explains it more thoroughly. The implication for the design is that curtain walls or deaf façades (dove gevins) should be applied in areas where noise disturbance passes acceptable levels.

3. Also in paragraph 3.3 DSM has a high risk profile, this presents a problem with external safety.

The MER Rijswijk South also states DSM has a risk contour according to the Risicokaart Zuid-Holland, as was also stated in paragraph 3.3 of this report. It states that the 10-6 risk contour overlaps a very small part of Rijswijk South, but that there are no consequences. This can also be assumed for the design location Calvé IDSM site. (Druijf, 2007: 47)

Mr. Spuiman, care-taker of the buildings of DSM, has also indicated that the risk contour is within the limits of the site. (Spuiman, 2008)

4. The noise disturbance caused by passing trains.

First of all in the MER Rijswijk South it is said that “assuming that the railway is not laid deepened [i.e. a tunnel without a roof], measures are needed to prevent environmental nuisance of bordering residential areas.” (Druijf, 2007: 16) The noise contour map further on in attachment 3, that was taken from the website for the Planstudie spoor Zuidvleugel, shows the extent of the disturbance.

The municipality Rijswijk has said to the Project team Plan studies Spoor Zuidvleugel, that they assume four tracks will be build through Rijswijk South. The municipality strives for a lengthened tunnel, with or without a roof. However three critical points are: The crossing of Canal ‘t Haantje between Rijswijk and Delft, the barrier the tracks create as with four tracks the railway crossing will have to disappear and to a lesser extent the accessibility of DSM by rail. This is less important as only few deliveries are made by rail.

Possible variants and alternatives that could solve these difficulties have not yet been researched. (Project team Plan studies Spoor Zuidvleugel, 2008)

This information was taken from the minutes of the meeting with the Project team and the municipality Rijswijk on May 29, 2008. Now one research about this noise disturbance has been carried out. It states that problems are preferably dealt with at the source, but that other solutions are possible. It states that if the values cross the preferential values (55dB rail traffic and 50 dB for industry) an exemption should be applied for. If the maximum limiting values (68 dB for rail traffic, 55 dB for industrial noise) are crossed it is not possible to apply for an exemption. However, by applying a curtain wall or deaf façade (dove gavel), housing is possible. Then, the judicial review to the Wet
geluidshinder (Law noise nuisance) can be cancelled. (Gort-Krijger, 2008)

Dynamic qualities:
5. Small scale changes can be made by the residents. The hybrid zone allows for the personalization of space. This transitional zone between private and public has been added to all buildings in the plan. From container dwelling to the buildings of the urban courtyard.

6. On a larger scale buildings can be replaced. The factory has been constructed over a period of 125 years, this process continues into the design. The design proposes to first use industrial buildings temporarily and then to either renovate or demolish them. This creates space for the urban courtyards, that are constructed according to the wishes of collective building groups. This means an urban courtyard consists of single buildings, that can also be replaced if this need arises.

7. There is space within the living-environment for additions. The plan itself is about making additions to the living-environment, the district, over a course of 20 years. Space is created by demolishing old industrial buildings. In the early phases there is a lot of space, that is build full during a course of circa 20 years. Also in the realised plan, the district leaves space for additions, for instance in the public space, the green stitches.

8. A living neighbourhood is also a multifunctional neighbourhood. One of the principles is to mix functions within the buildings in the district. A point of attention is to have a sufficient floor height. This should offer at least 3 meters interior height, this allows use as living, working and leisure space.

9. The physical identity of the dweller can be territorial. As soon as an individual takes possession of a living-environment, it becomes part of the identity. To reach this, recognisable territories are needed that, as a nested system, contribute to a readable privacy zoning. The nested system in the initial phases is self-built ateliers - hybrid zone - building - Calvé/DSM site or container dwelling - hybrid zone - container block - Calvé/DSM site. In the final vision the nested system is building - hybrid zone - courtyard - main axis - district. Not only the hybrid zone plays an important role in these systems, but also the neighbourhood is a step towards the public space in the district. The district in its turn is a system within the city.

10. Green space in the neighbourhood contributes strongly to a living living-environment. The choice for the model ‘Urban garden’ as a final vision is a choice for a green district, that connects surrounding parks.

Criteria thesis plan
The first set of design criteria found in chapter 3 of the thesis plan ‘Field of graduation objectives’ (Van der Kooij, 2008b:18):

1. Regional access to the site
This is provided by the public transport in the form of the Stedenbaan, Tram 1, Tram 17 and to a lesser extent the bus lines 130 and 37. The buses are available and also tram 1 from Delft Tanthof to The Hague is available from the start. Furthermore Delft’s main train station is within bicycle distance. Tramline 19 should connect Delft main station to The Hague Ypenburg and Leidschendam from summer 2009. From 2012 it should also run to the TU and Technopolis. (De Jonge, 2007) Also the new station Rijswijk South should be opened in 2020. This will be part of the Stedenbaan, which connects the cities in the South wing of the Randstad. It is a metro-like train system, which means train will stop there in a high frequency. The nearness of these stations, means the district can play a role in the South wing of the Randstad, a polycentric network city.

Furthermore the emphasis in the district is on foot and bike-travel, which connects well with public transport.

2. Enable self-organisation.
The matrix method was used to design the district, making the design process transparent and making use of the actors’ starting points. Furthermore the district has been designed according to physical characteristics enabling self-organisation of the district. The rules are based on the papers ‘Reviewing Strijp S and NDSM-wharf’ and ‘From low-level rules to higher level sophistication’, found below.
3. Mixing working, living and leisure at the scale of the plan area.

This initial criterion is now supported by criterion 8 from the topic Social Sustainability, criterion 2 from Knowledge City and criterion 5 from Delft: Knowledge city Paradox. This applies to the district.

4. Social mixing at the scale of the city, integrate the district in the city

This was also discussed in the criterion ‘8. Urban diversity’ from the topic Knowledge City. The aim is to not create an exclusive district, but one that is integrated in the city. This is a criticism to the current developments of the Knowledge city Delft. The site is integrated by infrastructure, but also through the connections in public space. The district is connected to the inner city, adding amenities to it and benefiting of the amenities it offers. Secondly it connects parks of Rijswijk and Delft. These three solutions integrate the district in the city and region, offering attractions for a diverse public and thus promoting urban diversity.

The second set of criteria was discussed in chapter ‘Relevance’ of the thesis plan. (Van der Kooij, 2008b:36,37) They come from the paper ‘Delft: A knowledge city paradox’ (Fernandez-Maldonado 2008: 17) and are recommendations for changes in Delft:

5. Adjust housing stock in the social housing segment and the free market segment. Supply two strategic groups: recently graduated students and foreign knowledge workers. Create inner-city environments for lower income groups and knowledge workers in artistic fields such as architecture and design. The author of this report interprets this as mixed use environments. (Fernandez-Maldonado 2008:12)

For a part the answer here is the same as criterion ‘8. A living neighbourhood is also a multifunctional neighbourhood’ from the topic Social Sustainability. The inner-city environments are interpreted as mixed-use environments, demanded by these two key-groups. Furthermore in the early phases container housing is put on the site to supply housing for these groups. At a later stage they can take part in developing their own buildings. By building collectively, money can be saved on development costs. These groups should not be the owners, the buildings can be build with help of a housing association. This way people can build their own houses, which the housing association owns and from which the apartments can be rented.

6. Upgrading buzz related amenities in the city centre and TU campus. In order to make Delft a more attractive and lively city, the city should encourage cultural amenities and stimulate private sector initiatives to create third places. These are places where people meet informally outside of work and outside of home. Third places are interpreted as leisure in the rest of this report.

The district becomes part of the city centre and should fulfil this criterion. It does so, as has been shown in the topic Knowledge City in criteria ‘7. Quality of life’ and ‘9a third places’.

Criteria from two papers on Self-organisation

According to ‘Reviewing Strijp S and the NDSM wharf’ the design for the creative district in this project should offer these potentials (Frijters et al, 2004):

1. The district offers space. Because no end-result is defined and uses have not been planned in detail, it has a large capacity to absorb.

When the industrial buildings are initially abandoned, they are used temporarily. It is important “not to connect detailed programmatic demands to a subsidy for breeding places, as this frustrates the dynamics” (Westerkamp, 2004: 90) As was suggested in criterion ‘7. Quality of life’ in the topic Knowledge City “the cheap space enables initiatives without the need for risky loans or high threshold procedures” (Westerkamp et al., 2004: 89) This means the result should not be planned in detail and it has not been planned for that stage.

To develop the district further the plan suggests a durable structure and a system of collective building. The structure offers space in which uses can be absorbed.

2. The district is sustainable and resilient. It is the product of gradual developments instead of a master plan that has the intention to change the site all at once.

The finished plan is plan, offers flexibility and does not aim to develop the site all at once. The phases -2009, 2020 and 2030- are indications based on infrastructure developments in the context. These are moments that can benefit the
development of the site.

However, there is a chance to improve this in the final design. The investment costs should be as low as possible, to ensure a gradual development of the district.

In phase 3, a car bridge is proposed across the harbour. This could also be a bicycle bridge, as it the street stops some 200 meters further. Another argument for this intervention is to keep the main street unsuitable for through car traffic in the future.

3. The district shows the possibilities of self-organisation. Where governmental authorities look the other way, developments are left to others. The users and inhabitants take the opportunity to contribute to their own environment. They can react to local circumstances within a small time which contributes to the flexibility of the site.

   The same criterion as ‘2. Enable self-organisation’ proposed in the thesis plan. The matrix method was used to design the district, making the design process transparent and making use of the actors’ starting points. Furthermore the district has been designed according to physical characteristics enabling self-organisation of the district, these are presented in the next section of this paragraph.

The second paper ‘From low-level rules to higher level sophistication’ (Van der Kooij 2008b) specifies the spatial preconditions to enable self-organisation of an urban district in the Netherlands.

4. The carrier of the environment should be durable and the build-in elements adaptable to man’s needs, the livability.

   One of the preconditions of the district is to find a solution for a durable structure. Decided was to use two: ‘Industrial legacy’ and ‘Urban courtyards on a axis’. To use the industrial legacy means use of the existing industrial buildings and the paving at the site. This is transformed to the next structure. An axis is created on which urban courtyards are situated. This serves a structure for the collective private clients in which to build their buildings.

5. Buildings should allow for the personalization of space. Users should be able to make their own territory readable and the zoning in the dwelling should allow for the interaction between private and public.

   Different gradients of application can be recognised for this pattern. People can in the most extreme case (collectively) design their neighbourhood, the other extreme are additions to the windowsill. (Van Dorst, 2005: 298)

   In the first phase self-built ateliers and container dwellings are proposed. As has been explained in paragraph 8.2, these can be build by the residents. The buildings of the urban courtyards are collective designs. In attachment 2, the reference for one of the buildings in Vauban, Freiburg, the reference for this process in this project can be found. This shows that every resident has designed their own floor plan and façade.

6. A hybrid zone should be added to buildings to soften the transition from private atmosphere into public space.

   This is the place where residents can feel safe when locking up the door with his or her back towards the street. A front garden, a height-difference in the pavement, a space in front of the door created by a relieved façade or several flower boxes can all create this zone. The hybrid zone creates a zone from which social interaction can be engaged; 80 % of all informal social contacts in a neighbourhood start from a front garden. This hybrid zone is also a zone which can be personalised and prevent the possibility of looking into the dwelling. (Van Dorst, 2005: 290)

   This transitional zone between private and public is added to all buildings in the plan. From container dwelling to the buildings of the urban courtyard.

7. Forces of attraction needed to couple urban elements together are strongest at short distance, this implies creating a compact district, a village in the city.

   The reference to illustrate these strong forces of attraction was the compact inner-city of Paris. “The forces (Rule 4) between the different elements appear to be the greatest when there is a greater contrast in qualities such as texture, colour and curvature.” (Van der Kooij, 2008c: 14) These contrasts are greatest in a compact district, which would mean creating a village in the city. The different villages, i.e. districts, build up the city.
The district designed on the Calvé /DSM site is a compact district in the city, holding different functions within walking distance. It is integrated and part of the city, but also a district in its own right. This reminds of the criterion ‘9. recognisable territories as a nested system’ for the theme Social Sustainability.

8. A bad organisation between modules can destroy all couplings at the lowest scale, an approximate linearization leads to a clear urban ordering. This implies to create spaces to stay.

   Rule 5 ‘organisation’ implicates that the idea behind a grid alignment is false. Salingaros illustrates this with help of an example. Imagine a field of sticks of different lengths and colours randomly scattered on the ground which should be ordered. Of all the patterns obtainable, the most unimaginative is one that separates all sticks into ordered rows of the same colours and the same length. Regardless of which way of ordering, a ‘mathematical symmetry’ will create a large-scale ordering. (Salingaros, 2000: 306)

In no stage of the plan a grid alignment is proposed. The main axis introduced in phase 2 is the most prominent linear element. This has been made an approximate linearization.

In every phase spaces to stay are readily available. The most important factor in that is the focus on pedestrians and cyclists, not on motorists.
Fig. A3.3 Noise contours Railway through Delft
Between building 2 and 4 is 26 meters of space. If building 3, the residential farmhouse is demolished the main street can be continued to Rijswijk South. It has a profile of 24.5 meters. The greenhouses to the north are removed by the zoning plan Rijswijk South.
Building 3, residential building. This could be demolished for the main axis.

Building 4, historic farmhouse, year on the roof: 1860.

Building 5, Townhouse.

Building 6, historic farmhouse.

Building 7, bungalow, apparently another house in the back.

Building 8, row housing.