



TÉCNICO LISBOA



## STRATEGY FOR TRANSFORMING AN INDUSTRIAL CANAL ZONE

Reusing the sources of Breda harbour

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Extended Abstract

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## 1.0\_INTRODUCTION

This report describes and justifies the project developed while doing the Erasmus mobility program at the Technische Universiteit van Eindhoven, being submitted as the graduation report to the Integrated Master in Architecture at Instituto Superior Técnico. The project was developed in the design studio 'Industrial waterfronts\_ transforming "the kanaalzone" of Breda'. The studio proposed to transform and renovate the industrial area in the north of Breda, being aware of the potential which a waterfront has in the renovation of the city.

The investigations into theoretical and built sources became crucial in the design process, what is reflected in the report structure. The report is divided into three parts: the first one representing the research topics, the second one a propose of a strategy to implement an idea which is capable of regenerating the whole industrial area, and the last one represents the development of one specific building in order to prove the validity of the overall plan.

### 1.1\_OBJECTIVES

The overall aim of this report is to present one strategy to renew the industrial area of Breda, integrating it into the city adding value to it, while taking into consideration its industrial heritage identity and the ecological concerns present in the rethinking of the city. While demonstrating the versatility and potential of industrial waterfronts through the adaptation of a new program which is capable of generating a new life into this area. Four main guide-lines have been developed and discussed along this report:

1\_ Respect the industrial heritage buildings existent in the area, analyzing which elements are important to preserve its memory and identity, while transmitting a continuation from the past which is adapted to the current reality.

2\_ Maximize the potential of the waterfront, improving its public space, while reflecting the lack of green spaces in the area.

3\_ Revitalize the area through the program, whilst understanding the needs of local community. Combine these two realities involving and inspiring the whole communities.

4\_ Proposed an ecologic system which will improve the biodiversity in the city, having sustainability in mind.



fig. 1\_ Breda in Netherlands



fig. 2\_ Industrial area in Breda



fig. 3\_ Influence studied area

## 2.0\_PROJECT FRAMEWORK



fig. 4\_ Vinkstraat in Belcrum District



fig. 5\_ Speelhuyslaan Street



fig. 6\_ Belcrum Haven\_Backker en Rueb

factory



fig. 7\_ Demolish area



fig. 8 \_ Artistic Studios

To justify the project it was firstly clarified its framework: the assignment demands, the physical, cultural and historical features of Netherlands, as well as the evolution of the city and its industrial area.

The studio assignment is an exercise that takes into consideration the needs of the city and the urban problems, leading to rethink and reorganize one specific area. The “water front studio” is an investigation that started in 2010; studying five Dutch cities: Helmond, Tilburg, Heindhoven, s’Hertogenbosch and Breda have an industrial past and all of them are linked by one water circuit. Without restrictions but always with coherence it was given to the student total freedom on decisions: analyzing all the situation, point out the urban problems, create a strategy to improve the urban quality of the area, compose a generic program for the intervention, choose one specific area or building to develop, create a detailed program for it and respond with an architecture solution.

The Belcrum port started to be excavated in 1923, which attracted, some years later, the R.K Barony Serbian Horticultural Society that bought a piece of land in the area and began to produce and sell vegetables and flowers, being the starting point of the industrialization in the Belcrum area. Other companies with related activities had settled down in the area, with a combination of slaughterhouse, fruit and vegetables, creating a market. The industrial character had changed progressively with the occupation of heavy metal factories, the study of the particular factory *Ketelmakerij NV Machinefabriek Breda Vh Backer en Rueb* will be further developed. The production continues to progress until the seventies, when the companies moved and the remaining buildings were demolished. In the nineties many spontaneous associations emerged in the area to present to the Municipality the neighbourhood’ problems and share their preoccupations concerning the intentions of the Municipality to renew the area.

Nowadays, the studied area has favorable location; it raises the value of the land and increases the speculation because it is situated near by the railway station. It is a mix of consolidated living neighborhoods, the Belcrum district, and an extensive industrialized area where some industries are still in activity, others were abandoned and some of them were just demolished. This fragmented area is a result of an industrial past where the

urban regeneration has been acting slowly over the years. The irregularity of the zone is expressly visible on the borders between the industrial and housing areas, creating tensions and conflict zones. These two different morphologies have a strong opposing identities.

Besides the urban problems, this area has an enormous potential and identity. The canal and its industrial heritage confer a singularity to the site.

### 3.0\_ PRÉ-PROJECT RESEARCH

#### 3.1\_INDUSTRIAL HERITAGE – REUSING THE LEGACY

The industrialization process transformed dramatically the urban landscape. The implanted large structures at harbor areas have been changing the cities morphology, and their cultural, social and economic dynamics. After the Industrial Revolutions and the period of glory, the industry had changed their productions systems, what consequently resulted in a relocation of the industry, letting behind all their structures, which gradually have been falling into decay. In recent years, some derelict industrial sites have been reclaimed, some of the new design strategies focused on the sustainability, quality and multi-functionality of the space, with attention to historic, socioeconomic and cultural aspects.

The investigation of theoretical and practical strategies which renewed industrial landscapes and buildings, understanding their historical value, had result in joining compilations of different projects into diverse subjects which had been important in the designing process and propose.

Apparently redundant industrial places can be reinterpreted and reused; preserving the marks of industry on the landscape is a way of valuing and retaining the industrial past. The value of the identity of the place and its memory is a complex subject whose interpretation would depend on individual backgrounds; as Zumthor refers, "architecture is about images. Images of your memory and your experience"<sup>1</sup>. Each person has different memories and consequently different influences on the interpretation of the identity. The reinterpretation of the materiality can take many different shapes and involve a wide range of actors. The identity can be preserved working with the beauty and strength of the

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<sup>1</sup> Zumthor, P., 2005, p.9



fig. 9\_Meelfabriek - The identity of the structure preserved



fig. 10\_Wastergas Fabriek - Waterfront public space



fig. 11\_Westergas Fabriek.- Gas holders transformation into a pond

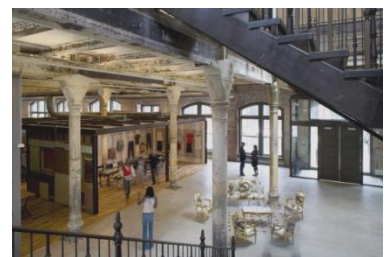


fig. 12\_ Urban Outfitters Corporate Campus- new structure into the original space



fig. 13\_Hinman Research Building - a new structure permeable which permits to read the original volume of the building.

physical elements, respecting the structure or significant elements which would contribute for an industrial atmosphere.

The duality of the industrial buildings like the factory which transmits bright and dark aspects, was a rich source for those who had started to reinterpret those places. In the context of the assignment, the study of physical transformations in industrial building is focused on the different ways of adding floor space, with the aim of responding their programmatic demands. Mainly, there were grouped three different ways of complement the need of space: constructing complementary buildings, adding floor levels or work the inner space of the existing building. The decision of how to add floor space has several conditionings, such as the surrounding landscape, the interpretation of the industrial features and preservation of its identity, local governmental rules and the quantity and quality spaces which are necessary.

The examples demonstrated that several different uses can be adapted to the industrial structures. However, it is important to recognize the population's needs and consider them when evaluating the physical capacities of the space, is essential for the effective improvement of the quality of life of the local community. When implementing mixed uses the area achieve a more active urban life, increasing the potential of the waterfront. Furthermore, some areas of the intervention, public or private, would get benefits if their uses are flexible, having a sustainable activity which can grow in time, giving dynamic to the project.

The theme of the waterfront is important in this project due to its location; the harbour area needs to be integrated in the city, bringing city's creativity and space quality to the area. The relation between industrial structures and the water can be divided in two categories: one includes the buildings that are very close to the water letting no space to public areas and privileging the building's users; the other one, related to the buildings with a considerable distance from the water, letting room to public areas in the space in-between. The reflection of these characterizations results in intentions to develop a design which gives importance to the public space and do not forget to privilege the users of the waterfront's buildings due to their permanence characteristic.



### 3.2 ECOLOGICAL SUSTAINABILITY \_ REUSING SOURCES

The ecological concerns are present in the contemporary world and is inherent skills of the architect, being present in the gentrification process of industrial areas. In this work the ecological concerns are associated to specific ways of reusing the resources, what can be a vehicle to improve the urban landscape and the life quality of the inhabitants. They were analyzed three main subjects: the typologies and benefits of the green spaces, food sustainability into the urban context and how to use the water as an element to improve the quality of the urban environment.

The set of green spaces constitutes the urban ecological structure of a city, the maintenance and improvement of this structure is very important for the life's quality of the city's inhabitants and environmental issues. The benefits of green areas inserted in the urban environment are numerous: ecological, climate and pollution, economic, social, cultural, and healthy benefits. The progress of the relation between the city and the nature is present in the contemporary urban issues with the aim of reducing the contrast between city and campaign. The different typologies and scale of the green areas have different proposes and offer distinct functions, being all of them important in the creation of diversity urban elements.

The expectations of changing the life of the city's inhabitants and offer alternative ways of living, is the motivation to develop the work through the implementation of urban agriculture. Although it is a recent concept: including a rural activity in the urban environment, the introduction of agriculture in the city has been used in several countries with different local conditions. Its ecological, economic and social benefits are seen as an aspect of food sustainability and urban planning. In this project the implementation of this use is worked locally. While in the urban strategy are indicated the areas to a future development of the work.

Due to the fact that the agriculture needs a large amount of water and nutrients, the research of possibilities which would create a sustainable system, had lead to the investigation of the aquaponics system. This method influenced the design decisions thorough functional proposes, what formerly was a predominant characteristic in the design process of industrial buildings.

Having the conscience that industrial areas have to resolve the contamination problem of the soil and water, it is important to think which are the positive remarks in the relation between industry and nature. Are the industry and nature two sharply distinct concepts? They were presented examples of how the industrial structures and the nature can have



fig. 14\_Duisburg Nord Park - The nature through the industrial structures

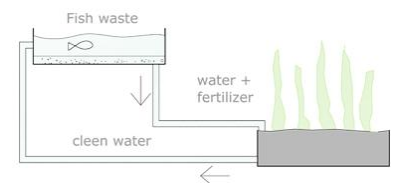


fig. 15\_Aquaponic system - close system which fertilize the plants while cleaning the water through fish's waste



fig. 16\_ Urban morphology

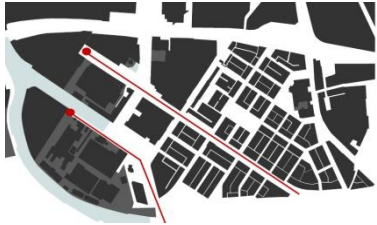


fig. 17\_ End point of the principal streets

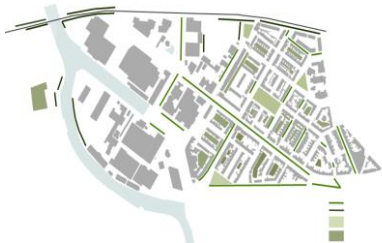


fig. 18\_ Green typologies



fig. 19\_ Belcrum district as a catalyst to the industrial zone

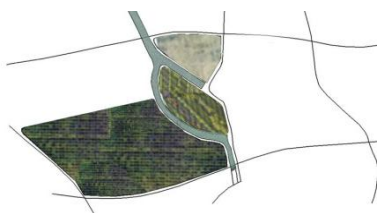


fig. 20\_ Green Atmosphere concept to the three areas



fig. 21\_urban planning-creation of public spaces at the waterfront

blurred boundaries, and even generate an harmonious combination between heritage cultural and natural landscape. The project presents a possible solution where the identity of industrial heritage embodies natural elements: water and food production, which aims to create a sustainable system to the community.

#### 4.0\_PROJECT DEVELOPMENT

The exercise of designing has the motivation of changing and improving the human habitat. The project was developed in three phases: the analysis of the area, a strategy to implement in all the area and a specific area to develop and implement the strategy.

The analysis and observation of the place had contributed for a better understanding of the local reality and needs. They were studied the place's morphologies and characterization, understanding the urban constraints, qualities and problems. Concluding as a priority, the wish of resolving the lack of public areas and green spaces into the studied area, while creating a closer relation with the canal and giving to the industrial heritage a protagonist role.

The urban concept had born from three existing realities: the lack of urban space, the non existence of green areas at the industrial zone, and the sharp division between the Belcrum neighbourhood and the industrial zone. Furthermore, the Belcrum district can be an enormous influence because of its political urban vegetation. Considering the challenge, it was indicated the creation of a green web composed by different typologies and scales of green spaces, what will increase and improve the ecological structure of Breda. The density of the green mass, would depend on the percentage of built-area and the function associated to it. This had a direct relation when studding the program, associating the available resources and characteristics of the place, with functions which could work as a tool for the revitalization process. The implementation of a mixed program where different age groups could interact, creates a social cohesion while offering a variety of uses. Concerning the program it can be highlight the implementation of urban agriculture in the urban design planning.

The development of a concrete solution, which could prove the validation of the urban strategy, went through the creation of a cooking school at one of the waterfront industrial buildings. The combination of the school with the production of food, had developed a new unconventional active reality, which motivates and offers a school open to the community through its program and its design. The most positive strengths of the project are the creation of a different reality which is believed to be enable of captivating several publics, what, consequently, would bring a new life into this industrial zone. The respect of the

industrial memory and the identity of the elements which were considered the most significant in the characterization of the place, the volumetry of the building and its steel structure, was an achievement to enrich the urban identity. The relation between the old and new and the way how the new emphasizes the old is also an important achievement of the project.

The renovation strategy has three main goals: maintain the image and volumetry of the existing building to be possible to the population still can recognize the place; respect the interior features which gives identity to the building, letting its history be recognized; and involve the school and its surroundings in the growing food's theme. The architecture and conceptual options are directly or indirectly, related to one of these goals. The program to the current building has different functions, some are public, others are private. The main function of the building is a cooking school, which is complemented with other programs, such as a restaurant, a biological market and a green house where food can be grown.

In this project it was taken the option of crossing the different circulations correspondent to each function group. Thus each group can interact with the others, generating curiosity and interest for the work of each other; the public and the private are not separated and involve the public in the process and ambiances of the cooking school

The steel structure has an enormous presence in the space. The project of Meelfabrick helped to recognize the importance of the structure and how to experience the heavy-load structures. The solution to maximize the authenticity of the structure in this project was to create contrast between the structure and the new elements, by using a different materiality and do not touch each other.

The area of the building which have a bigger length has been an extension; this area will be used as a green nucleus, where the products will grow. The choice of this position is due to the fact that this volume can contact with the outside and the inside of the building, being important to communicate the process of growing food and transmit its atmosphere. This area is seen as a private garden, where not just the owner has its benefits, but also the users of the public space at the surroundings

To grow food is important to have some considerations in mind, such as the light, the water, the space to grow and how to maximize the space to obtain the maximum variety and quantity of products. To maximize the green space, the type of construction is different from the one mentioned previously. Because the structure was prepared to carry heavy loads, it was possible to had floor area to create more room to plant more products.



fig. 22\_ Interior of the factory 1983

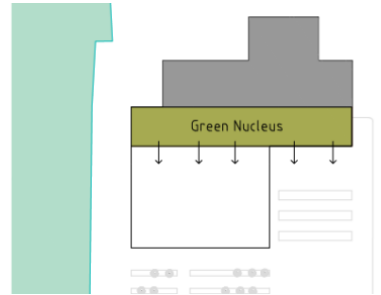


fig. 23\_ Green Nucleus connection with outside and inside



fig. 24\_ The two distinguish interventions

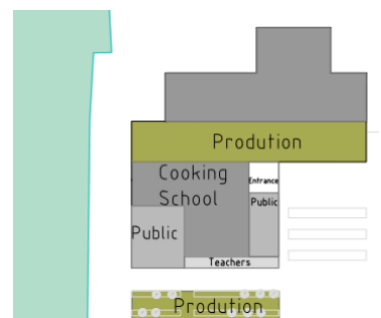


fig. 25\_ The distribution of the program pretends provoke interaction between functions



fig. 26\_ Main circulation

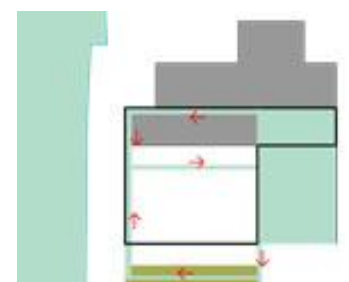


fig. 27\_ Water circuit of Aquaponics system



fig. 29\_ Building to develop

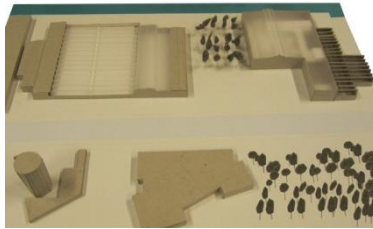


fig. 30\_ Area of transformation

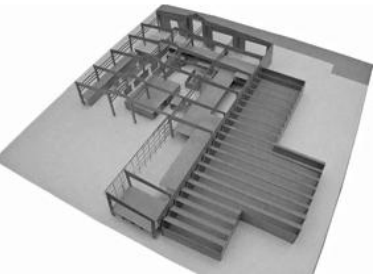


fig. 31\_ Propose of intervention



fig. 32\_ The entrance, visual contact with the green nucleus



fig. 33\_ Green nucleus- hanging structure



fig. 34\_ feeling the structure and the whole volume in the interior

The fact that the program contemplates food production, leads to research sustainable ways of gardening. One sustainable way of growing food is using the aquaponics system, that introduces water in the process, providing the necessary nutrients to the plants through the waste of the fishes. The interpretation of the tanks, which have to contain water and fishes. The introduction of a new element -water- in the landscape would add value to the existent. The choice of using a front line at the opposite side of the canal had created a close relation with the water, attributing a new image to the building and the public space, generating, also, new dynamics with the water in the outside and inside space.



fig. 28\_ Model of the two types of construction

## 5.0\_CONCLUSION

The conclusion of this report focus on diverse matters due its complexity and vastness of overall subjects. A first conclusion is that these objectives cannot be generally answered, being important the contextualization of a concrete reality. The project proposed, is one contextualized contribute for a possible solution of how to revitalize a canal waterfront through its industrial heritage.

This report had achieved the objective of communicating and clarifying the ideas developed during the studio. It had also created a balance between the creation of a final academic graduation paper for IST and the flexibility of the Dutch master teaching method. The support and openness of all participants, who embraced the exchange of cultures and knowledge, was important for structuring the process of doing the project and the report, seeking solutions for a better urban landscape through the knowledge shared.

The research topics have the aim of contributing to a richer understanding of a canal zone transformation; looking at differentiated planning solutions suitable for the specific situation of the given territory. It is important to underline that there is no "model solutions" which can

be applicable anywhere to all kind of population. But, there are references which can be adopted as inspiration aiming the creation of a strategy and solving specific problems.

Concerning the project developed, it is believed that its ambition of being as realistic as possible, without losing its stimulating concept was achieved. Generally, the design responds to the formulated guidelines and the constraints of the local circumstances, while, reflecting the theoretical knowledge, concerning the transformation of industrial sites and ecological attitudes aiming to improve the urban environment.

To revitalize the area it was important to have in mind that the new functions are one important tool of regeneration. Concluding that new appropriated uses would work as a catalyst for the existent community and its economic, cultural and social development. It is also important to reflect about the complementary needs of the users, the mixed uses increase the web services and the population's movement, optimizing their supply

Concluding, the project had showed the capability that the industrial sites and buildings have to improve the cities and the quality of the urban landscapes; situating the efforts to recognise the industrial past in relation to an understanding of the current needs and opportunities to implement changes in the city, thus in the society. Proposing a project where the implementation of urban agriculture makes part of the urban design and not the simply left-over spaces of the city, aims also to make aware the Municipality of Breda about the food sustainability issues and the importance to implement local incentives. Taking advantage of the Municipality of Breda being present at the project's final presentation, it was aimed to achieve future expectations on the implementation of urban farming in Breda.

It is hoped that the present study have contributed to increase the expectations and the possibilities of the Breda canal zone's transformation through one specific point of view. This report is seen as a document and process accessible for future projects and further investigations.

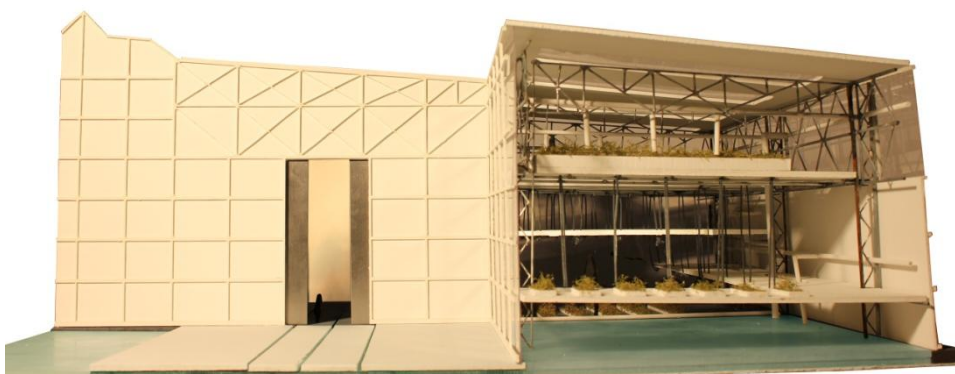


fig. 35\_Cooking school - the new relation with the water

## 6.0\_BIBLIOGRAPHY

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