MASTER

Weaving waves
Istanbul's waterfront transformed

Laarhoven, F.

Award date:
2007

Link to publication
WEAVING WAVES
Istanbul’s waterfront Transformed

Graduation Report
Freek Laarhoven
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June 2007
Graduation Committee

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Graduation Report
Freek Laarhoven

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The topic of my graduation project has been introduced by the Master 4 project 'E80; Interstitial Space in Istanbul's Urban Shores'. In first instance the possibility to explore the relation between architecture and water encouraged me to join a group of seventeen students and start this project. I would like to take this opportunity to especially thank the three students, Pedro Gil Almeida (Portugal), Maria Huber (Italy) and Antonio Saez Garcia (Spain) that together with me formed a group and instigated the graduation process.

As a result of the complexity of the urban situation in Istanbul, that has been the starting point for my graduation project, I did not reach the level of detailing that I previously expected or hoped to reach. Meanwhile the final result of the architectural design and its inextricable relation with the proposed urban strategic plan abundantly strengthens my satisfaction with the project.

For enabling the project I would like to thank all persons involved, especially my fellow students, John Lonink and Hans van Rijnberk and the supervisors Irene Curulli and Hüsnü Yegenoglu.
Introduction

Urban Waterfront Transformation

Istanbul's current waterfront situation can be described as a confrontation; a confrontation between water and asphalt. Water represents the Sea of Marmara, the Bosporus and the Golden Horn, the waters that surround the city of Istanbul. Asphalt represents the coastal highway.
that was implemented during the city's modernization to deal with the increase of motorized traffic. Istanbul's embankment was seen as the solution for the congested traffic veins throughout the city in the 1960's. Since this period, the city banks have been extended by using landfills to create space for the implementation of a littoral drift. Besides the morphological change of the shoreline brought along by this new infrastructure, the surrounding waters were no longer used as they were before. The implemented coastal highway separated the city from the water and caused the loss of what used to be a lively waterfront culture. The typical bustling fishing harbours, the beaches, the water-related architecture such as floating pools, platforms and piers almost all disappeared and were replaced by a tabula rasa. An undefined, monotonous, interstitial space between the highway and the water came into being.

The implementation of the littoral infrastructure has had a generic impact on Istanbul's shores along the Sea of Marmara. The graduation project focuses on a specific area between Caddebostan and Bostanci in the Asian part of Istanbul. This part of Istanbul's shoreline has typical topographical and morphological characteristics that need to be studied in order to improve the current situation. Besides the negative consequences that the implementation of the littoral infrastructure has caused for the characteristic lively waterfront culture, this asphalt has also been a great democratizer. The population in these waterfront districts existed almost exclusively of urban elite. Upper class residences, exclusive clubs and expensive restaurants created the social class. New residents from every corner of Istanbul can nowadays use the coastal highway to reach the coast without any effort. For example, in the summer of 2005 these residents massively crowded the beaches at Caddebostan, spread their blankets, displayed their barbeques and started using the urban waterfront as an accessible, recreational area.

Project Strategy

The order of succession of this graduation project has been quite an unorthodox one. The preliminary Master 4 project immediately started out as a designing project. From day one our project group hardly ever left the workshop and we created a very large series of models to come up with a proper strategy to improve the current waterfront situation in Istanbul.

After the preliminary project a theoretical research was done. This research resulted in an essay "Urban Waterfront Transformations". The main contents of this essay was determined by several case-studies. These case-studies all concerned transformed or transforming waterfronts. The specific cases were chosen for several reasons. The most important one is the resemblance they all show to the situation in Istanbul. These similarities are mainly based on infrastructural foundations; motorways, highways or provincial roads that cause psychological, physical or visual barriers. The scale on which the waterfront transformations have been taking place diverges from object related architectonic interventions to provincial urbanization. Specific cases dealing with the waterfront transformations were investigated and described so as to be able to learn how to manage planning and designing.

After the theoretical part the principles concerning planning and designing are compared to the Istanbul situation so as to see what they can bring about in dealing with the city's current waterfront situation itself. The outcome of this comparison has been an important foundation for continuing to develop the urban strategy and the architectonic design.
Part 02  Urban Strategy and Theory
Location of the Design Area

Istanbul and the Waters

Looking at the map of Turkey we can see that the country is positioned between three seas: the Black Sea on the north and the Mediterranean and the Aegean Sea on the south. The country is divided into two parts. The larger part of the country is located on the Asian continent in the east. The smaller part is located on the European continent in the west.

A third, embraced sea is the Sea of Marmara which is connected to the Aegean Sea. The Black Sea and the Sea of Marmara are also connected to each other by a strait called the Bosporus. This relatively narrow connection between the seas makes up the boundary between the two continents and has a length of approximately 30 kilometers.

The Bosporus also cuts straight through the city of Istanbul. There are two bridges that connect the two parts with each other and a third bridge is being planned. At the entrance of the Bosporus there is an inlet called the Golden Horn. This water cuts through the European part of Istanbul and together with the Sea of Marmara encloses the ancient peninsula. The coastal highway as described in the introduction was implemented almost along the entire banks of Istanbul, in the western European part as well as in the eastern Asian part. As the map shows, the design area for the project is located in the Asian part of Istanbul across the islands. These islands are called the Princess Islands and are very popular destinations in summer. These islands can be reached by ferries that depart from the Bostanci harbour which is located in the design area.
Design Area

The aerial picture shows that the region concerning the project is almost completely urbanized. The only actual exception is the area that is located between the implemented coastal highway and the Sea of Marmara. This interstitial space is the area where the main physical interventions of the project are proposed. Almost all the buildings in the area are houses and apartments. Two or three floored private dwellings that used to border the sea and expensive apartment buildings up to eleven floors are occupied by the middle and upper class of the city. Even though this area is located in the Asian part of Istanbul, the population really counterbalances the traditional population of Istanbul and the inhabitants are almost as occidental as Western Europeans.

Approximately 300 meters from the sea one of the most important commercial shopping streets is situated. This Bagdat Street is also called an open air shopping mall and will later on appear to be fundamental for the proposed urban strategy in dealing with the current problematic waterfront situation.
First Diagram; Separation of the City and the Waterfront

To illustrate the next chapters I developed several diagrams. These diagrams will help to explain the urban strategy proposed for revitalizing this specific waterfront area in Istanbul. The diagrams can be based on specific analyses or on expected developments. They can also be conceptual ideas or applied interpretations of strategies which I analyzed in the case-studies in the essay. To prevent this part of the report from losing its clarity I only briefly expose the case-studies that are relevant.

The complete essay that contains elaborated information about the case-studies is a separate digitally attachment to the report.

Problematic Situation

The first diagram shows the position of the coastal highway marked with a red line. It's clear that the area above the red line is completely built up. The white area below, which will be called interstitial space from now, is the area in which the main architectonic interventions are proposed. The coastal highway has been the instigator for the current problematic situation. It really cuts off the city from the waterfront. For starters it's very hard to physically reach the interstitial space.

The coastal highway, which in this area is a four lane road, is a very crowded highway, especially during rush hours. The capacity load and the traffic behaviour of the Turkish people make it really dangerous to cross this road. There are hardly any traffic lights or zebra crossings and if there are any such regulating elements, they cannot be used properly.

Separation City and Waterfront
Because the buildings nowadays border the coastal highway instead of the Sea which they used to border before, they lost their characteristics and became less valuable. Private houses for instance used to directly adjoin the water but they currently have cars racing through their backyards. The interstitial space has never been designed properly. Patches of green - if any - were implemented to camouflage the bad urban planning that was carried out during the city's modernization. These fragmented patches seem to be laid out completely at random and hardly show any coherence to each other.

The empty character of the area on the other hand can have a positive effect as well. The interstitial space is one of the few spaces left in Istanbul that isn't built up yet. In this way the area can act as a counterbalance to the hectic city. Even though this emptiness can become high-end public space, it seems that there should be some kind of input in the area that will re-attract the people to the waterfront to enjoy the water and the open character that the shoreline entails.

The images in the next column give an impression of the neglected interstitial space.

_Pictures of the Neglected Area_
Second Diagram;
Urban Strategy, Concentration

Bagdat Street

As mentioned in the introduction, approximately 300 meters up country an important commercial street is located. This Bagdat Street nowadays seems to be the place to see and to be seen. The street is filled with commercial activity such as expensive clothing shops, showrooms, bakeries, department stores, restaurants, cafes and banks. Practically all buildings in this street are 5 or 6 stories high of which mostly only the ground floor is used for commercial purposes. The remaining floors are still used as apartments. Besides this indoor commerce there are lots of Turkish people practicing street economics. With their stands they try to sell textile, sweets or other delicacies. Because this glamorous area is the perfect place to show off, nowadays expensive cars slowly drive through Bagdat Street just to impress. After having reached the end, they hurry back to the beginning by using the coastal highway and start driving the same route again. Like the coastal road Bagdat Street is a four lane road as well, only in the opposite direction. Next to these four lanes very large sidewalks are located on both sides. The parcels around the buildings at Bagdat Street used to be private areas belonging to the apartments. In the course of time this space has become semi-public and is used for commercial ends like terraces and for exposing goods. Bagdat Street actually seems to be the waterfront boulevard but shifted a few hundred meters up country. The street has become a public area where people are shopping, enjoying a drink or just hanging around. Especially the youngsters can frequently be found in this area.

Concentration

Bagdat Street has four main important meeting points which generally are very crowded. These points are the starting points for the urban goal that is getting people back to the waterfront and letting them enjoy this place as a
beautiful public space. By using existing streets perpendicular to Bagdat Street, four physical and visual linkages to the waterfront are made. At the locations where these so called injection roads intersect the interstitial space new concentration points are created. This system and the specific locations are marked red in the diagram.

The concentration points or nodes are supposed to be architectural interventions which contain a program that will conjugate certain activity and make people want to visit the waterfront. In this way the waterfront should become at least equally attractive to the area around Bagdat Street. Furthermore the nodes are to create easy physical access in terms of crossing the coastal highway. The nodes are not only supposed to be final destinations, they should also serve as links between the commercial hectic city and the open public areas in between the nodes that have already been referred to as breathing moments. In order to be smooth links, these nodes should contain the ingredients that characterize both the hectic city as well as the breathing moments in between. In this way the nodes are becoming transitional areas but will remain having their own identities.

Furthermore the system of concentration points creates a variety along the waterfront. In this way the strategy deals with the monotony of the existing waterfront. The diagrammatic interpretations in the next chapters will further elaborate the strategy of this concentration system.
This chapter explains the way in which the city is actually extended towards the waterfront. The emphasis will be on the injection roads mentioned that are most important in this interpretation of the urban strategy.

The principal change will be the transformation of the injection roads into commercial streets. These injection roads will obtain similar characteristics to those of Bagdat Street. The ground floors of the buildings will become commercial but the floors above will keep their housing program. Just like in Bagdat Street many of the parcels around the buildings will transform from private to semi public spaces that are related to particular commercial purposes. For example these semi public spaces can become terraces for restaurants or cafes or areas to expose products or advertisements. This perpendicular extension of the commercial Bagdat Street is a phenomenon that is already occurring. The urban strategy proposed restrains the commercial expansion in the area from Caddehbozan to Bostanci; the strategy guides the commercial activity through the four indicated injection roads from Bagdat Street towards the waterfront and prevents the area from becoming completely commercialized.

Designing the concentration points with an attractive program as well as a contemporary type of architecture on the waterfront will automatically increase the use of these injection roads as linkages. As these streets will be more crowded a logical consequence will be the commercial activity establishing itself in these streets. On the other hand some physical interventions to emphasize the city pointing into the waterfront are proposed.

First of all the injection roads are transformed into boulevards with a pedestrian privilege. Only one lane for cars towards the waterfront is kept. This intervention provides the opportunity for the pavements to be widened like the pavements in Bagdat Street. This infrastructural intervention is possible because of the existing infrastructural system which will be explained later on. Instead of being completely filled with

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**Third Diagram: City into the Waterfront**

**Injection Roads**

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*City into the waterfront*
driving and parked cars the injection roads will in this way gain a quite open, spacious character which much better corresponds with the character of the waterfront. Some small additional interventions like moving existing trees to the side will improve the visual relation between Bagdat Street and the Sea of Marmara. To create these visual relations towards the waterfront, the existing slope of the streets can perfectly be used. Bagdat Street is located up to 20 meters above sea level. While descending towards the waterfront a constant view of the Sea of Marmara and the horizon is provided.

The images in the next column give an impression of the the existing injection roads and the occurring commerce extension towards the waterfront.
The injection roads described start at important meeting points in Bagdat Street. These meeting points cause a fluctuation of activity throughout this commercial street. The fluctuation of activity logically corresponds with a fluctuation of activity on the waterfront. Together with the implementation of an interesting program and a contemporary way of creating architecture the injections from Bagdat Street cause a very high level of activity at the nodes. People are re-attracted to the waterfront. As the transition between the nodes and the breathing moments in between the nodes will be quite fluent, it is expected that this high level of activity will gradually tone down further away from the nodes. The diagram shows a gradient red color with the intense red areas (the meeting points at Bagdat Street, the injection roads and the concentration points or nodes) as areas of high activity and the less intense red areas (the breathing moments) as low active more tranquil areas. As a positive consequence to the urban concentration strategy, visitors of the waterfront will in this way have the opportunity to choose a location which is most suitable for them. Visitors can enjoy the waterfront for example in the vivid nodes, where they can find lots of people and lots of things to do, or they can choose a more tranquil spot somewhere in between the nodes and enjoy the waterfront in a more quiet way.
The fifth diagram indicates the possibility of using water in dealing with the waterfront revitalization. The diagram that shows the water making penetrating gestures towards the city doesn't have to be read literally. Each of the four nodes though should have some kind of relation to the water to emphasize the specific water related location. The diagram could be read more literally and artificial bays can actually be created. In this way the distance of the shoreline is lengthened and more protected water areas are created that could be used to emphasize a typical waterfront atmosphere. For example these bays can function as harbors for fishing boats or water markets can be set up. Another possibility is to use the water for recreational ends like swimming, surfing or water-skiing. The water can be used in a programmatic way and the water can be used as an architectonic designing tool.

The strategy of using water in revitalizing waterfrotns was also used by Foster and Partners in their proposal for the renewal of Toronto's Harbourfront. This case-study is discussed in the attached essay.

Foster and Partners proposed to use several existing street linkages from the city to the water that can be compared to the proposed injection roads in Istanbul.

These linear routes all end in existing inlets which are designed in a way that a typical waterfront atmosphere is created. These inlets have an industrial background but can nowadays definitively be used in a more recreational way as shown in the two examples of plans for the inlets.
The interpretation of the diagram in the previous chapter can have a positive influence on the waterfront atmosphere, but it can also have a physical influence on the linear continuity along the shoreline. The next diagram therefore shows an interpretation of the urban strategy that is more focused on the linearity of the shoreline. There aren't many public spaces in Istanbul that are stretched out over such long distances as those along the coastline. This continuity together with the openness and the views of the Sea of Marmara makes this public waterfront a perfect recreational area for jogging, biking and strolling. At the location of the future nodes, this landscaping could make an inviting gesture into the city. This strategic interpretation is very much based on two case-studies, of which one is exposed in the attached essay. These two cases both use a strategy for revitalizing a waterfront, in which landscaping is used for creating a waterfront park and in dealing with infrastructure as a barrier between the city and the waterfront. The first case is Louisville's Waterfront Park designed by Hargreaves Associates, Landscape Architects. The aerial picture and the diagram on the next page show how this waterfront park seamlessly connects to the city grid by underpassing a highway that used to be a physical and visual barrier between the city and the waterfront. This plan transformed the neglected rear of the city into a well planned urban waterfront.

A second case-study is the Olympic Park in Seattle designed by Weiss-Manfredi Architects. In this case landscaping is again used to create a waterfront park. Instead of underpassing the infrastructural barrier, the two lines of infrastructure are overpassed here to create an inviting gesture into the city and to make the waterfront easily accessible again.

Continuous Landscaping
Louisville’s Waterfront Park; Aerial View and Diagrammatic Interpretation

Seattle’s Olympic Park; Artist Impression and Diagrammatic Interpretation
Waterfront Park

In the proposal for the urban strategy I already mentioned that all programmatic interventions will take place in the concentration points. This strategy automatically leaves space for the breathing moments in between the nodes that are proposed to be designed as a continuous green waterfront park. This continuity should not be interrupted by the nodes, but at the location of the nodes landscaping and architecture should be integrated in a way that the complete shoreline over the four kilometers can be regarded as one continuous waterfront park.

This waterfront park will be designed as a hilly landscape filled with trees that provide shade. Because the landscape is slightly elevated next to the coastal highway the landscape also functions as a noise barrier. In this way the tranquil character of the breathing moments is emphasized.

First of all the natural way in which the waterfront park is designed, with the hilly landscape, the trees providing shade and the big areas of grass will help accentuating the coastal park as a counterbalance to the hectic city with its urban characteristics. Second of all the soft carpet of grass together with the relief of the hills creates comfortable possibilities for visitors to sit or lie down and enjoy the views of the sea. Adjacent to the water the existing boulevard remains in existence so that bikers and skaters can easily move along the coastline. The existing beaches like the one in Caddebostan are maintained and will be open and easily accessible for all social strata. There are several existing small clubs like fishing clubs or surfing clubs. It's quite probable that these clubs will move to the nodes, where they can establish themselves with much better facilities than the neglected facilities they are using at the moment. Of course these clubs aren't obliged to move and it is definitely not the expectation with the strategy proposed that these breathing moments will be completely free of any program at all. Besides the nodes that are the main entrances into the coastal park, several possibilities to enter the park in between the nodes will be maintained.
Identity and Integration of Architecture and Landscape

Before leaping to the architectonic scale in which I elaborated on one of the four nodes I would like to describe several additional qualities that are brought along by the urban strategy proposed. Most of these qualities can best be understood by an early design proposal for the concerning area which is shown in the model picture.

As mentioned before the strategy of creating concentration points clearly focuses on re-attracting people to the waterfront. The location of the concentration points originates at important meeting points in Bagdat Street. In this way the strategy mainly affects people from the nearby surroundings.

The purpose is to find a balanced relation between Bagdat Street and the waterfront.

In the design proposal landscaping is the common element along the four kilometers of waterfront. All four nodes have their own contemporary type of architecture that is based on integrating landscape and architecture and approaching the sea from the city. They all have their particular way in guiding pedestrians from the injection roads into crossing the coastal highway and reaching the water.
Apart from the more or less common dimensions all the nodes contain a characteristic program. Health, culture, sports and communication are themes that determine a node's identity. On a larger scale the entirety of four kilometers of waterfront including these four nodes with different architecture and program will have a much larger range of influence. Together with the waterfront park the nodes will be an interesting public waterfront for people from anywhere in Istanbul.

The way in which the users of the coastal highway experience the renewed waterfront is part of an infrastructural system which will be explained in the next chapter.

**Infrastructure**

The coastal highway probably is the most important factor in this project. It has been the phenomenon that created the current waterfront situation and introduced the project. In this final chapter of the first part I will try to explain how infrastructure can contribute to the urban strategy proposed.

**Unidirectional System**

I already mentioned that the coastal highway is a four lane road and is unidirectional to the southeast. Bagdat Street also contains four lanes, but in the opposite direction. Between these two main roads there are approximately fifteen streets that connect these two main traffic veins with each other. Almost all these connecting roads are unidirectional, some towards Bagdat Street and some towards the coastal highway.

My proposal, as I mentioned, is to transform the four injection roads into commercial boulevards with a pedestrian privilege. Only one lane for cars towards the coastal highway will be maintained to create an open and spacious linkage with the waterfront. To make sure that the injection roads can still be reached from the coastal highway, the connecting streets next to the injection road will have the possibility of being entered from the coastal highway. Subsequently cars can branch off from these adjacent roads to reach the injection roads. This unidirectional infrastructural system is already in use in the area and in order to function as I propose the system doesn't need to be changed radically.

**Experiencing the Sea**

In a previous chapter the waterfront park has already been described. I mentioned the elevation of the landscape close to the coastal highway which functions as a noise barrier and therefore helps emphasizing the tranquil character of the breathing moments. There is no visual contact between the users of the coastal highway and the Sea of Marmara because of the elevated landscape. This restricted relation with the sea in between the nodes intensifies the experience of the sea when passing through or entering a node. In this way the nodes can encourage users of the coastal highway to interrupt their drive and enter one of the nodes and the waterfront park for a short break or even for a longer visit. The coastal road exists of four lanes of which one lane each time branches off and enters a node. A more detailed example of how this could work will be explained in the next part of the report where I describe the node designed.

This way of manipulating infrastructure could help re-attracting people to the waterfront. Not only people from the neighborhood, but especially users of the coastal highway can enjoy the urban waterfront in this way.
Parking

The nodes will contain a certain program of which the purpose is to attract people to the waterfront. Additionally to this program all nodes should therefore have sufficient parking facilities. As the injection roads are proposed to be free of parked cars the nodes should also be able to accommodate for a number of these cars. Parking facilities are quite rare in this area and should be integrated in the process of further developing the nodes. There are several parking lots adjacent to the coastal highway on the city side of the highway. These parking lots can still be used. Close to these parking lots secondary entrances into the coastal park can be probably built.

Water Related Infrastructure

One characteristic of a node is the joining of many types of infrastructure. I already described the pedestrian's privilege, the possibilities for biking and skating and the opportunities for cars as participating traffic. Another type of infrastructure that should be part of the nodes is water infrastructure. As the nodes are located on the edge of land and water, they - together with the parking facilities - can operate as a switch between land traffic and water traffic. The position of the fourth node on the right corresponds with the situation of an existing harbor. This Bostanci harbor has been mentioned in the introduction as a harbor from where ferries depart to the Princess Islands. This harbor is very well connected to other important harbors along Istanbul's shoreline.

The other three nodes will not incorporate harbors as big as the one at Bostanci but they can probably incorporate quays for boats. A public system for water transport can be developed and in that way the relation between all four nodes can be intensified.
Part 03 Architectural Design
Developing One of the Four Nodes

The following part of the project was to develop one of the four nodes into an architectonic design. The image shown highlights the location of the third node that I selected. The choice of this particular node was made in an early stage of the project and based on architectonic qualities that created opportunities for making a design in which water would play an important role. Meanwhile the research and the urban strategy elaborated, changed the point of departure which resulted in a final design that doesn't show much coherence with the one previously proposed. The final design seems to have become a contemporary one that contains characteristics of all four designs previously proposed for the concentration points. The way I developed and designed the node is based on my own interpretations of the urban diagrams. This doesn't mean that all nodes should be developed in the same way. On the contrary, the diagrams are free of interpretation which enables a varying entirety of four nodes, all with a different program and a characteristic architecture.
The Principle

This chapter will explain diagrammatically how I came up with a specific principle that founds the architectonical concept for the final design. This principle is based on my interpretation of the diagrams that abstract the urban strategy. In this way I tried to express the urban strategy into a contemporary architectural design, which emphasizes the correlation between the scale of urban planning and the scale of architecture.

I developed a series of diagrams that explain the steps that are taken to translate this urban strategy into the conceptual principle that determines the lay-out of the architectural design.

Step 1

At the location of the concentration point proposed three diagrams should determine the ingredients of the design.

- City into the waterfront
- Continuous Landscaping into the City
- The Use of Water
- Three Components: City, Landscape and Water

Integrating these diagrams should bring out an architectural design that contains characteristics of all three components: city, landscape and water.

Step 2

In order to integrate the three components, city, landscape and water, land is sliced into strips and space for water is created. This slicing will occur in two directions; perpendicular to the sea and parallel to the sea. These two directions emphasize the transitional character of the node. In the first instance the slicing perpendicular to the node can be read as a literal extension of the city. Secondly the slicing parallel to the sea enables the connection with the coastal landscape and prevents the area from being interrupted which accomplishes continuity along the coastline.

The corresponding diagrams are shown at the next page.
Step 3

The strips created are subsequently bent upwards and bent downwards in the two directions. In the direction perpendicular to the sea two physical possibilities are created to cross the coastal highway and access the interstitial space; the highway can be underpassed or it can be overpassed. Parallel to the sea a fluid connection to the natural, undulating landscape is enabled. The design is interpolated between the landscape.

Underpassing the Coastal Highway

Slicing Parallel to the Sea

Overpassing the Coastal Highway

Step 4

The fourth and last step is a sum of the previous steps. The combination of the strips in both directions and their wavy sections leads to the principle of weaving which is shown on the next page.

Interpolation between the Landscape
Principle of weaving
In the previous chapter the principle of weaving was argued from an urban point of view. Besides this foundation based on the urban strategy proposed, the principle brings out several possibilities on a more architectural scale as well. Some of these possibilities are exposed in the next sketch.

First of all, the sketch shows that the strips created establish the defining components of the spatial design. This particular method of creating a disassembled artificial landscape causes the strips to become the dominant elements in which buildings and specific program are subordinated.

Secondly, the interwoven structure creates a numerous variety of different spaces. The node for example contains open areas of water, covered areas of water, outdoor public spaces, indoor public spaces, buildings surrounded by water, arch spans, extended piers and curved slopes. Another important quality of the weaving principle, which is related to this diversity of spaces, is the way the water is experienced. The water for example can be experienced intensively and be used for e.g. recreational activities, or the water can just serve as a beautiful view to be enjoyed.

Furthermore, the existing coastal highway can be integrated within the principle as a participating strip and in that way become part of the entirety.

These possibilities are just some generic architectonic qualities that are brought along by the principle of weaving. The final elaboration of the design will be exposed in the next chapters.
In this chapter I will introduce the final design by showing some important steps that have been made during the design process. In these steps the evolution of the design can be traced back easily. All these steps are captured in images of models of which the first one shows a proposal before the principle of weaving was introduced. The last picture shows the model of the final design.

Important themes that have been investigated during the design process, which can be read in the succession of these model pictures, are for example: integration of infrastructure, transitional character, coherence of the strips, materialization and junction with the surroundings.

**First Phase**

This first capture of the design process shows a proposal in which no principle has been introduced yet. It’s an attempt to combine the two urban diagrams in which water and landscape make a gesture towards the city. There is no synergetic correlation between this landscape and the water. Moreover there is no continuity of the landscape and the water appears to be fragmented. The existing infrastructure acts as an alien element that doesn’t contribute to the concept of a nodal system. Finally the design doesn’t show much emphasis on the third dimension.

**Second Phase**

This model shows the conceptual principle of weaving. Besides all arguments that were brought up in the previous chapter, a certain principle brings equivalence into the design. A network of strips offers multiple possibilities and freedom of movement. The use of different colors emphasizes the possibility of integrating the different components: city, infrastructure, landscape and water. Finally an important characteristic is the emphasis on the two directions that were mentioned before: the extension of the city perpendicular to the shoreline and the continuity of the landscape parallel to the shoreline.
Third Phase

The third phase shows the translation of the principle into the location. This model can be regarded as the basic conceptual model for the final design. There are several important aspects that need to be improved, though. For instance, instead of being integrated the coastal highway still exclusively cuts through the node. Furthermore the material used suggests a material similar to the coastal park which has been described as a hilly lawn. This material restricts the use of the node which is quite important in attracting people towards the waterfront.

Fourth Phase

In this fourth model a first attempt was made to shape the conceptual model into a more concrete constructible design. An important maturation is introduced by the integration of infrastructure into the design. I tried to accomplish this by branching off one lane of the coastal highway into the node. A negative development is the loss of the fluid shapes that previously nicely corresponded with the principle of weaving. Another development is the way that the existing wave breaking pier that previously bordered the design has become part of the entirety. This intervention was made to bring about better connections with the surroundings.

Fifth Phase

The fifth phase of the process is quite an important one. First of all the number of strips is reduced to make the entirety look less chaotic. One of the four lanes of the coastal highway branches off sooner and cars are slowly introduced to the node. Once arrived at the node these cars gain more freedom in driving through the node. Moreover paved material is introduced which increases the possibilities for different uses. Patches of green still remain which affects the fragmented character of the entirety in a negative way. Furthermore the edge of the design is emphasized by an offset which is created between this design and its surroundings. This intervention negatively affects the smooth connection with these surroundings.
Sixth Phase

The sixth model doesn't differ very much from the fifth model. Motorists can experience the node more freely. Furthermore radical interventions are made to let light through the widest strip. These interventions are in conflict with the resemblance of the strips that is pursued. The architectural expression and the possibilities of the weaving principle are undone by the coalescence of the strips for the benefit of internal circulation.

Seventh Phase

The seventh model is the one produced just before the final model. The principle of weaving is clearly brought back into the design and the proportions of the strips and the inlets bring out a coherent entirety. There aren't any radical operations that break down the fluid shape and the continuity of the strips. Furthermore the infrastructure is carefully integrated in the design and the transitional character of the design is brought back eliminating the previously introduced offset.

Eighth Phase

The final design is represented in this last model in which - compared to the previous model - only a few adjustments are made. For example the two strips, that are positioned parallel to the sea and connect to the bordering landscape, are subtly materialized with wooden boards. A further description of the final design is made in the next chapter.
Illustrating Model Pictures

This chapter will elaborate on the architectural design by showing a series of photographs of two models. The first model is the one of which the picture is shown last in the previous chapter. This model is made on a scale of 1 to 500. The second model of which several elucidating pictures will be shown is made on a scale of 1 to 200. This model is an enlargement of two of the seven strips of the complete design and shows more detailed information about for instance the construction and the materials used.

Overview of the Model, scale 1 to 500

The first picture shows the complete design in its surroundings.
Approach and Branch Off

The first two photographs show the way in which the node can be reached by users of the coastal highway and how infrastructure becomes an important part of the node instead of only cutting through the node. The upper picture was taken from just above the coastal highway. In the back it shows one of the strips passing over the road which physically enables the reaching of the waterfront from the city. It also already shows the right lane branching off into the waterfront park. The bottom picture shows this detached lane more clearly. The lane penetrates the coastal park which transforms the type of infrastructure from a highway into a more rural road. While driving through the coastal park a first view of the Sea of Marmara is already provided. The double curve forces drivers to slow down. Decreasing speed then ensures a careful descent and entrance into the node in which a secondary slow speed type of infrastructure is suggested. This type of infrastructure is introduced to provide for a pedestrian privilege.
Pass Through and Exit

The next two pictures show how cars can pass through the node by using one of the three remaining highway lanes. This is the moment at which drivers experience an abrupt intens relation with the node and the water, especially compared with the reduced relation with the water they had in between the nodes. When the node is left by car, space is created to speed up and to reconnect to the coastal road, as shown in the second picture. The landscape is elevated again to reduce the noise nuisance in the breathing moments.
Parking

Drivers are given the possibility to park their cars at a first parking lot which is located under the part of landscape between the three lanes that go through the node and the one that branches off. Furthermore, cars can be parked under the edge of the design as shown in the picture. These instant parking facilities are provided almost all the way along the internal car route. A second parking lot is located under the landscape on the other side of the node.
Car pier

The next image shows the existing pier that has become part of the total design. This pier has gained an additional function besides breaking waves to provide for quiet water adjacent to the beach. The pier can be driven over and in this way become part of the secondary infrastructure; a beautiful spot to interrupt your drive and enjoy the views of the sea. As a counterbalance to Bagdat Street this pier becomes a perfect opportunity to show off your expensive car to the users of the beach.
Rectilinear Platform

This image shows the end of the right strip fencing off and becoming a rectilinear platform as a counterpart to the existing car pier. From this platform the second parking lot under the landscape can be entered. Furthermore a direct access to the waterfront boulevard is provided.
Boulevard Approach

This image shows the existing continuous boulevard along the water. On the right the new park is situated and further away the strips from the design are visible as piers extended from the city.
Park Connecting Strips

The next image shows the two strips that connect the park from the one side to the other. These strips are materialized with wooden boards in a subtle way to establish the connection to the park. The left park-connecting strip attaches to the strip that is the extension of the injection road. Furthermore the image well shows how the coastal highway is integrated in the total design and matches the other strips.
Reflecting water

This last picture of the first series provides an overview in which the principle of weaving can easily be recognized. Furthermore, the water shows its reflecting characteristic causing impressive spatial qualities. The material properties of water provide for beautiful dynamic plays of reflections and shadows.
This photograph was made when the model was illuminated. The picture shows the situation in the evening or at night. In these periods the building volumes appear between the strips and indicate possible night activity. These building volumes foresee in programs like a restaurant, a nightclub and a sport club. These programs should contribute to the intensive use of the node. As well as during the day as during the evening and night the node should be an attractive area to visit. Besides the night situation the picture also emphasizes the way in which the commercial city is extended towards the waterfront.
Extension of the Injection Road

This picture is also taken while the model was illuminated. With the picture I likewise tried to show how the commercial activity of the first floors of the buildings at the injection road is extended into the node. Moreover the picture shows how this injection road is literally extended into the water to become a pier.
Close View of the Night Situation

The last picture of the model on this scale gives a closer view of the night situation and the illuminated building volumes. Again the injection road is shown extended towards the horizon and the water is used to reflect the illumination.
Several pictures of this second model on a scale 1 to 200 will be shown. These pictures will provide more detailed information about for example the materials and the construction. A set of people is put down on the model to give a better indication of the scale of the strips. The model shows two of the total of seven strips that together account for the complete design. One strip in each direction is enlarged.
Crossing Strips

The first picture shows how the strips cross each other in different directions. One of them is partially materialized with another color of cardboard which is supposed to represent the wooden boards that connect to the adjacent park. Furthermore the way how the transition is made from one strip to another is shown; parts of the strips are extracted and bended to become slopes and connect to other strips. Some small trees are placed on the strip that is partially materialized with wooden boards to emphasize its connection to the park. These trees are placed in round boxes that serve as benches as well. On the concrete strips that are extended from the city rectangular boxes are placed. These big boxes are used as benches, contain garbage cans and have integrated lighting.
Integrated Stairs

Zoomed in a little bit further the model shows how stairs are subtly integrated in the concrete strips without disturbing the wavy design. Because of the variation of the angle of the slopes the steps have different lengths and can become larger cut-outs to sit in.
Construction

Zoomed in even further the picture shows the building volumes positioned between the crossing strips. Almost all vertical construction is located in these building volumes in order to maintain free underpasses for boats. These construction elements are carried out in trusses that fit the exceptional construction which supports the strip that overpasses the coastal highway.
Easy Access into Covered Areas

This next image shows how the outdoor public space is extended into a covered area. Because the construction trusses are position lengthways of the strip the entrance façade doesn't need any constructive elements at all. In this way this indoor space is easily accessible.
Restaurant

The last model picture shows the restaurant under the end of the widest strip. This restaurant is completely surrounded by a glass façade, just like all other building volumes, which provides a panoramic view of the Sea of Marmara.
Sections

Even though all seven strips are designed in a similar way, they all have their own characteristics. Different activities can take place on different locations. For example, the water area in the left of the design is destined for recreational activities and the water area in the right will be the part that allows different types of boats to enter.

In this chapter I will describe each strip separately. I will describe the sequence, the program and the activities that take place on or between the strips by showing the sections of the strips. Because these sections occupy two coexisting pages, the descriptions start at the next page.

To fit the pages, the sections are resized to a scale of 1 to 750.
Strips Perpendicular to the Shoreline

Recreational Strip

The first strip perpendicular to the shoreline can be driven up by cars that have branched off from the coastal highway. When drivers choose to go left after having entered, they first underpass a strip parallel to the shore which provides a covered area that contains facilities for the recreational use of the water. The recreational area can thus be found in this part of the node. For example public dressing rooms, lockers or toilets can be found in this building volume.

Because the recreational strip is used by cars and pedestrians these two types of users are separated by small water gargoygles to prevent most inconvenience. The sound of the clattering water should muffle away the noise of the passing cars.

When drivers go to the right after having entered the node they will share a climax of experience with the sea. Drivers at first underpass a second strip. This crossing provides another building volume which can be used for facilities related to the beach like renting beds and parasols. After having exited this passage, cars slightly ascend to the existing peer and turn to the right. At the end of the peer cars turn around 180 degrees and experience the complete horizon of the Sea of Marmara and its offshore islands. The peer is almost completely free for use and cars can stop at any moment and get off to experience the Sea of Marmara and its lovely views even better.

The further a visitor goes towards the sea, the less controlled the water will be. This diversity brings out the possibility to use the water in multiple recreational ways.

Areas can for instance be used by families with small children because of the calmness of the water and the safety of the site. Further away from the city the recreational use will have a more active character.
01 Car pier
02 Waterfront park
03 Park-connecting strip
04 Facilities for the beach
05 Car entrance
06 Park-connecting strip
07 Facilities for the recreational area
08 Parking lot
09 Coastal highway
10 Recreational area
11 Covered passage for parking
12 Intersection with other strip
13 Covered passage for street economics
14 Restaurant terrace
15 Restaurant
Extension Strip

The second strip is a literal extension of the city. The route starts at Bagdat Street and ends all the way in the sea. When the strip is walked over, an altering succession of relations with Sea can be experienced. In the beginning, at Bagdat Street, the sea is already made visible. This visual relation continues all the way to the beginning of the node. Just before the entrance of the node the lane for cars starts to descend so the cars enter the node on the level one meter above sea level. The pedestrians enter the node at four meter above sea level and just a little bit later they will also descend to the low level above water. This is the moment where the relation with the sea becomes more physical and the experience becomes more intensive. On the left side a water market with lots of boats is located to create a typical waterfront atmosphere. On the right side the water is used for the recreational purposes mentioned. In the beginning the water is very much controlled and resembles an artificial pool. Subsequently pedestrians continue their walk and underpass the coastal highway that used to be the big barrier in approaching the waterfront. The three lanes that make the coastal highway at the node are slightly extricated to bring down light. Subsequently the first park-connecting strip is under passed. Pedestrians here walk between the construction trusses that are positioned at all locations where the strips cross each other. Immediately after this underpass visitors start to ascend when they continue their walk. When the highest level of this strip is reached, the complete horizon becomes visible again. Instead of under or over crossing a strip, at this location the strips in two directions intersect so that an easy connection to the waterfront park is made possible. The visitor now can choose to branch off and enter the park or to go straight ahead and continue in the direction perpendicular to the shoreline. For the last option the visitor needs descending another slope that automatically brings the visitor closer to the water again. At the end of the strip the visitor is completely surrounded by water.
01 End of pier
02 Intersection with another strip
03 Park-connecting strip
04 Underpass between trusses
05 Coastal highway
06 First descent towards water
07 Underpassing strip
08 Entrance
09 Early descent for cars
Program Strip

The third strip in the direction perpendicular to the shoreline is the widest of all extended from the city. This peer starts as an extension of the terrace proposed in front of the Suadiye Hotel. This hotel now becomes completely orientated towards the sea. Instead of being obstructed by the coastal highway the hotel now has direct waterfront access. Even though this strip starts in front of the hotel it's accessible for each random user. Instead of under passing the highway this stroke starts ascending and over passes the highway. The ascending slope incorporates a wider stairway that has a complementary function that is being a tribune looking back over the city. When the top of this slope is reached, simultaneously the highest point of all strips is reached. This spot provides magnificent views in all directions. Subsequently the first park-connecting stroke is over passed. After these two passes this slope further descends and incorporates another wide stairway that can be used as tribune to enjoy not only the view, but potential performances as well. Because the next part of this strip is covered by the second park-connecting strip, these performances can be open air or covered. Moving glass panels can completely close this covered space of 21 by 30 meters, which is shaped as a parallelogram. Covered areas like these can be valuable contributions for a node. It makes the design season proof; in winters the sea view can still be enjoyed and supplementary activities, like performances can take place.

These areas aren't unlikely to convert into areas with commercial activities like the street economics that are typical for the surroundings. Under this covered part, at sea level another covered area can be reached. This area is completely surrounded by water and will not continuously be passed through by pedestrians and will thus have a character that is more a destination one than a pass through. This is the reason why the program of this building is more private. There are three more private volumes like this that are completely surrounded by water.

The program of this second volume is a club. This club has the character of a bar or café during the day and the character of a nightclub during the nights. In this way the node will be a place to...
be twenty-four hours a day. After passing the last park-connecting strip, there’s a possibility to take the water taxi, that is part of the infrastructural system described. A last slope takes the visitor up to an elevated platform that again provides beautiful views of the sea in all directions. Under this ending platform a third volume is located which contains a restaurant. Together with the clubs this restaurant supplements the commercial expansion of the city into the node.
Boat Strip

The fourth strip perpendicular to the shoreline is another strip associated with the design that includes the possibility for cars to drive over. In the beginning at the city side the peer is elevated and intersects with the first strip parallel to the shoreline. From this strip cars come driving up and are given the possibility to reconnect to coastal highway or to continue their drive further into the node. A first slope descends to under pass the highway and reach the water level. On the right side the water market can be found. This water area, deepest into the city only allows small boats to use the water. Under the first park-connecting strip a building volume is located which contains facilities for the water market and for the harbour. This harbour can be found between the two park-connecting strips. The strip at this location serves as a quay for the harbour. Under the second park-connecting strip another covered volume is located which contains facilities for the harbour as well. In the end the strip kinks to the left and a rectilinear platform can be entered. This platform acts as a counterbalance to the car pier on the other side of the node. From this platform a second parking lot can be entered.
01 Rectilinear platform
02 Park-connecting strip
03 Facilities for the harbour
04 Quay
05 Park-connecting strip
06 Facilities for harbour and market
07 Coastal highway
08 Water market
09 Intersection with another strip
Strips Parallel to the Shoreline

Water Market Strip

The first strip parallel to the shoreline has four distinctive areas. The first one on the left is the kinked extension of the recreational strip. The second area is the location where cars from the injection road have descended to enter the node. Pedestrians overpass this area and have a separated entrance into the node. Under the widest strip perpendicular to the shoreline, covered facilities related to the water market are located. On the right, the strip can be ascended and cars are given the possibility to reattach to the coastal highway. At this point the strip intersects with the strip perpendicular the shoreline which provides the possibility for cars to continue their drive into the node. Adjacent to the strip a covered passage provides for parking areas and street economics.

Section Water Market Strip

01 Covered passage for parking
02 Recreational area
03 Restaurant and terrace
04 Covered passage for street economics
05 Injection road and entrances
06 City extended strip
07 Facilities for water market
08 Hotel and terrace
09 Ascending slope
10 Intersection with another strip
11 Connection to coastal highway
First Park-connecting Strip

Besides making the transition between the two sides of the coastal waterfront park, this strip overpasses the recreation strip, the extension strip and the boat strip and it underpasses the program strip.

From the strip, slopes are extracted to enable access to the passing strips in perpendicular direction. One of these slopes connects to the sport club that is located at the water level and is surrounded by water completely. This indoor sport facilities contribute to the recreational possibilities of the waterfront.

Under the program strip another covered extension of public space is created.

Furthermore, under the park on the left a parking lot is situated which can be entered from the recreational strip and from the lane that is branched off from the coastal highway.
Second Park-connecting Strip

The second strip that connects to the two sides of the waterfront park overpasses the recreational strip, the program strip and the boat strip. These crossings provide for the programs covered as mentioned. Again slopes are extracted from the strip to enable connections to the crossing strips in perpendicular direction.

The park-connecting strip intersects with the strip that is extended from the injection road. This intersection is the location where the two directions literally come together and a smooth transition from city to the waterfront park is enabled.

Section Second Park-Connecting Strip
Construction

Column Free

This chapter reflects on the construction principles which are quite important in their relation to the architectonic appearance.

To emphasize the spatial principle of weaving I came up with a construction scheme which allows the strips to be almost completely free of columns. All vertical ballast is transmitted to the foundation via diagonal trusses that are positioned next to the facades of the building volumes which are located in position of the crossing strips. In this way the interwoven strips seem to freely float in the air and on the water.

Unobstructed Passes

The diagonal trusses are positioned perpendicularly to the span directions of the strips. In this way the transition from outdoor areas into covered building volumes is not obstructed by the diagonal construction elements. This principle is previously shown in one of the model pictures. In position of the connections of the extracted slopes to the perpendicular strips, the diagonal trusses clear out for an unobstructed access into the building volumes.

Corresponding Exception

The only exception that needs additional support is the widest strip that overpasses the coastal highway. The construction length to be spanned in this case is too long to span in once. Instead of using big columns, two construction trusses are designed to enable this column free span. The curved shape of the strip helps the construction span to be made. Because the moments of force are the biggest in position of the supports, the trusses have the largest construction height in position of these supports. The construction height in these positions fits the exact height of the diagonal trusses in position of the building volumes. In this way both constructions are inextricably related to each other. In the middle of the span the construction height can be minimized to create enough space for the under passing highway.

Consultation

The assumption that the construction of the strips can span the large distances is based on several consultations with Rijk Blok, teacher in Construction Management at the faculty of Architecture and in consultation with Betonson, a concrete factory from Son. This factory is specialized in large infrastructural construction spans.

Detailing

The drawing on the next page shows an enlargement of a part of a section. The beam used, to make the large spans, is one from Betonson and is called 'betonkoker dwvsp'. These beams with a construction height of 800 mm can establish spans up to 30 meter and are supported by a secondary beam that is called 'pijlerbalk'. This beam also is a product of Betonson. The secondary beam is subsequently supported by the diagonal truss which is constructed of round steel profiles with a diameter of 400 mm.

Together with a concrete top layer the total construction height of the strips becomes 1 meter.
Construction Principles
Atmosphere

In this final chapter I will show several images that should give a decent impression of the atmosphere pursued. Important details are the implemented people that should give an idea of the scale, and the materials used. The first image is an aerial impression which shows the inextricable relation of the design with its context. For the optimal use of the size of the pages, the series of images starts on the next page.
Water Market
Extension Strip and Restaurant
Continuous Park and Boulevard
View From Above the Coastal Highway