

# SHuǐ



a cura di

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# SHuǐ

A spatial experience to reconnect  
Shanghai's inhabitants to the  
presence of the water in the city

*A Margherita.*

*A Massimo, a Rossella.*



**Double Master Degree Thesis**  
**Interior Design**

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# SHuǐ

SH / shuǐ

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上海 + 水  
SHANGHAI SHUI

The two chinese characters 上 and 海 respectively mean *upon* and *sea*. Together they are used to identify the city of Shanghai.

The chinese characters 水 stands for **water**. It is a radical: it can be associated to other characters to form words related to water.

## ABSTRACT

The city of Shanghai is crossed by the Huangpu River that connects the Yangtze River, the first largest river in China, to the East China Sea. In this context, water has always represented a key element for its economical and geographical development; the name itself, the result of the union of two Chinese characters "上", above and "海", seaside, proves the strict relationship that exists between the city and the presence of water.

Today, Shanghai is facing a new phase where water is seen as a mean to enhance the livability of the metropolis making it part of the leisure and outdoor activities.

However, according to a deep observation carried out along the riverfront of Shanghai and to the analysis of the main interventions designed until now in this urban context, a lack of a direct and dynamic contact with water, that takes advantages of the positive effects it has on humans, was pointed out.

This study aims, through a research based and users' oriented project, to find answers to the research questions elaborated and so to re-establish a connection between Shanghai's inhabitants and the city, providing a different experience from the current one, which is merely static and visual. It wants to do it in a publicly accessible space used by citizens in a recreational way.

According to many experts in the medical, psychological and architectural fields, the presence of water in artificial environments such as big cities like Shanghai, is positive. In particular, tests carried out have proved its restorative power in urban public spaces and its ability to help us in reaching a state of "blue mind", a sense of calm and peacefulness that disconnect us from the frenetic metropolis context.

What the collection of case studies pointed out is a lacking application of these findings in the field of architecture and interior design. Therefore, the project, located on the Lu di platform, a previous dock along the East Bund, now a viewing platform within the Expo Park, is the attempt to transform this knowledge about water into an urban interior intervention also considering the research conducted on field. The intervention does not consider to change citizens' routine but, conversely to improve it.

The project inserts water into the daily activities that people do on the riverfront enhancing them through the different effects it has on humans. It allows users to discover not only its potentialities as a living element but also some of the core aspects of the Huangpu River that resulted obscure to the users despite their choice of spending time nearby it.

It is a free educational and experiential path along the water, a tribute to it, a living architectural structure that hosts the water of the surroundings, a "blue space" where one can walk or remain.

This research and the project are meant to be a starter point for future interventions in the city that could reconnect people to water making them appreciate this natural living element not only in a visual way.

**Keywords: Living water, Blue mind, disconnection, reconnection, urban interior design**

## 摘要

黄浦江是流经上海的一条水系，并将上海市分为两个片区，同时也是中国第一大长河扬子江汇入东海之前的最后一条支流。在这种背景下，水资源对于城市经济、地理的发展，成为了一个非常关键的元素。“上”与“海”这两个文字组成了这座城市的名字，也直接体现了城市与水有着密不可分的关系。

如今，上海正迈向利用水系资源提升大都市宜居性的新阶段，从而创造更多临水户外休闲娱乐活动的可能性。然而，根据对上海滨江地区的深入调查以及分析已经建成的沿江设施可得出：城市居民缺少与江边水系的进一步互动，而这种互动关系对于他们生活来说是具有积极影响的。

本次研究的目的是通过以使用者为导向的研究来找到所提出问题的答案，通过设计临水的公共休闲空间，重新建立一个上海居民与城市沿江体验之间的联系。根据在医学、心理以及建筑学领域的专业研究，水系在类似于上海这样高度人工化环境的城市中起到积极的作用。特别是在恢复城市公共空间活力和帮助城市居民远离喧嚣、平静情绪方面有着至关重要的影响。而从各个案例分析来看，上海仍缺少对于沿江公共空间的相设计。

本项目选址于上海后滩公园沿岸的芦荻台，旨在将对于沿江水系与城市居民活动的关系调研，转变成城市临水空间的休闲活动空间，以满足使用者的需求以及符合研究所得出的结论。设计将水这一媒介置入到居民日常的江边活动中，使他们能感受到水对于人们不同活动的影响。这可以让他们直接的发现其活动空间潜在的可能性，而对于不常在江边活动的居民也能间接的增加他们对黄浦江的了解。而这样的临水活动空间将会是一个自由的、无限制的、可散步可停留的沿江路径，而空间本身也是会随着水体改变而改变的可变结构。

本研究与设计是对未来城市中，如何通过城市活动空间设计将人与水系进行重组的一个起点，使生活在城市中的居民能够更加亲近自然并与其互动，而不仅仅只是视觉上的联系。

关键词：水系，平静情绪，远离，重组，城市活动空间设计

## ABSTRACT

La città di Shanghai è attraversata dal fiume Huangpu che congiunge il fiume Yangtze, il più lungo della Cina, al Mare cinese orientale; la sua presenza è stata un elemento decisivo per lo sviluppo economico ed urbano della città come conferma l'etimologia del nome stesso, composto da due caratteri “上”, letteralmente 'sopra' e “海”, 'mare'. Oggi, nonostante la città si trovi in una nuova fase di sviluppo urbano in cui l'acqua è vista come mezzo per migliorare la qualità della vita degli abitanti all'interno della metropoli, un contatto diretto e dinamico con questo elemento naturale è ancora latente. Un'attenta osservazione condotta su diversi tratti del lungofiume e uno studio dei progetti sino ad oggi realizzati in questo contesto ne sono la conferma.

L'obiettivo di questo studio è di ristabilire una relazione tra gli abitanti di Shanghai e il fiume tramite una nuova esperienza dell'acqua meno statica e meramente visiva. In particolare, si prefigge di costruire uno spazio pubblico e ricreativo che integri l'acqua come elemento caratterizzante.

Diverse indagini, condotte in svariati campi quali la medicina, la psicologia e l'architettura, hanno registrato i sorprendenti effetti positivi dell'acqua negli spazi pubblici degli ambienti artificiali, fortemente antropizzati come Shanghai, e affermato il potere di questo elemento di facilitare il raggiungimento di uno stato di “blue mind”, ovvero un senso di calma e pace interiore, che consente la disconnessione dalla frenesia e dallo stress metropolitano.

Tenendo conto della carenza di applicazione di queste scoperte in architettura, “Shui” si presenta come il tentativo di trasformare Lu di Platform, un vecchio pontile all'interno dell' Expo Park di Shanghai, oggi osservatorio sulla città, in uno spazio che accolga l'acqua coerentemente con le ricerche condotte. Il progetto si prefigge di migliorare la qualità della routine dei cittadini senza modificarla, per questo riflette sull'inserimento dell'acqua in alcune delle attività che oggi gli abitanti di Shanghai svolgono lungo il fiume. Permette, dunque, non solo di scoprirne tutte le potenzialità in quanto elemento naturale mai statico, sempre in cambiamento, ma anche di scoprirne aspetti chiave, oggi parzialmente sconosciuti ai fruitori che trascorrono abitualmente tempo sulla piattaforma, come emerso dalla ricerca utenti condotta durante la stesura.

In conclusione, “Shui” è un percorso educativo e esperienziale lungo l'acqua, un tributo ad essa, un'architettura sempre in cambiamento che ospita l'acqua che la circonda, un “blue space” dove passeggiare o sostare. Nonostante il suo carattere site specific “Shui” è stato pensato per essere un punto di inizio per possibili interventi futuri nella città che riconnettano i suoi abitanti all'acqua, permettendogli di apprezzare questo sorprendente elemento attraverso il coinvolgimento di diversi sensi.

**Parole chiave: Acqua, Blue mind, disconnessione, riconnessione, urban interior design.**

## ABSTRACT

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# 1 INTRODUCTION

The following chapter aims to provide an overview of the topic this thesis is based on: the relation that exists from the beginning of time between water and humans. In addition, it wants to explain the reasons, the objects and the methods that stand behind the research and the project come from it.

## 1.1 THE HISTORICAL AND CULTURAL VALUE OF WATER: HUMAN SETTLEMENT AROUND WATER

**W**ater has been on the planet, relatively in the same form and quantity, being a constant presence in people's lives, since the beginning of time. Throughout history, since the earliest civilizations, there is considerable evidence that communities have always heavily depended on water: its being vital for life has made it one of the main reasons of human presence and settlements. The relationship between the cities and water is as old as the cities themselves: as soon as humans started controlling it through canals, dams and aqueducts the change from a nomadic life to a stationary one occurred. As a consequence, social life started nearby the rivers conceptualizing the water as a substance that carries "humanity" and mediates social relationships. Many countries of ancient civilizations were situated by rivers, such as the ancient Egyptian civilization nearby the Nile, Babylon, the Indian developed along the Ganges, the sacred river of India, and the Indus, and the Chinese civilization, began and flourished in the valley regions of the Yellow River and the Yangtze River. The Ancient Greeks and the Romans too settled themselves along river deltas and they constructed ponds and canals for irrigation and places to fish and grow food. In particular, the credit of elaborating a system of public distribution of the water and hydraulic science belongs to the Romans: they involved the best architects and engineers to build many kilometres of aqueducts in order to take water to villages from the furthest springs. (Culligan, s.d.) An aesthetic value of water was added to the satisfaction of primary needs: their houses and public spaces were always adorned with water features decorated with elaborate sculptures. Furthermore, water began, immediately, to be associated not only with the settlements in general but also with the concept of recreation and wellbeing; the deep study on different temperatures of water and vapours Romans applied in thermal baths, the great inclination they had to them and the

way in which they were considered not only as places for body care but also for spending time, meeting and entertaining, is a proof.

Moreover water played a central role in religious history as a sacred substance: many sacrifices and propitiary gifts to the river gods as well as rituals such as baptisms, libations, holy ablutions, fertility rites, for blessing and protection from evil were common among people. (Strang, *The Meaning of Water*, 2004)

On the other side of the world, simultaneously, the Chinese and Japanese elaborated their own meaning and focused on the naturalistic effects of water in the landscapes focusing on its mystical, medicinal, religious and aesthetic value.

In particular, the Chinese elaborated the Fengshui, literally "Wind (风) and Water (水)", a traditional architectural theory that involves water for selecting sites and for building keeping an equilibrium between nature, built-up environment and people. Analysing the Form School's practice, one of the two main schools of thought of Feng Shui, based mostly on sites, on the shapes and conceivableness of the landforms, it is evident the strict relationship between this ancient Chinese practice and the role of water in allowing people to live in harmony with their surroundings. Its analysis is based on five geographical factors: namely dragon, sand, water, cave and direction; where water is intended as the flow of water through or bypassing the site and it is recommended to be always on the South of the site, its course should be calm and smooth, never fast or straight. (Mak) (Maka & Ng, 2005)

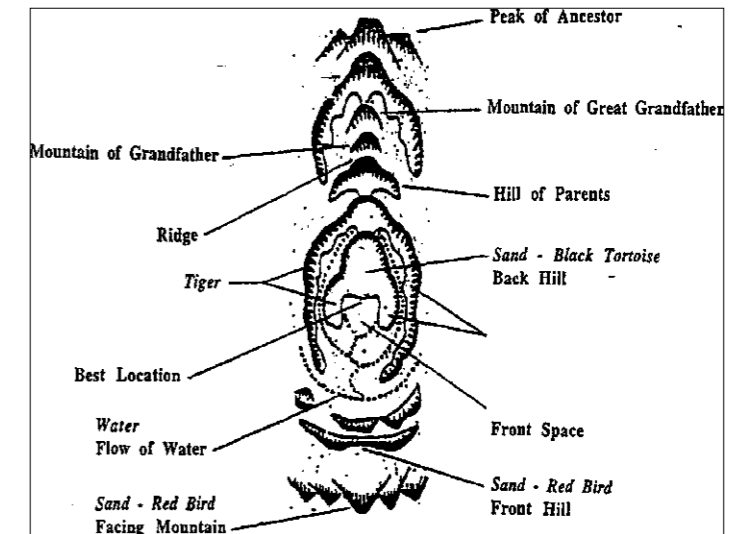
Vittorio Gregotti in "L'ultimo hutong" states that since ancient times, water, likewise the wind, represents for the Chinese culture, not only a geomantic instrument for human settlements but also a psycho-physic way of viewing the universe structure and harmony with nature. (Gregotti, 2009)

This view about the relationship between Chinese culture and water can be referred to the general inclination of people to settle nearby this element and look at it as a source of harmony, with oneself and with the environment.

## 1.2 PROBLEM DESCRIPTION AND RESEARCH QUESTIONS

The background of this study proves simultaneously that in Shanghai, as for other harbour cities, water is the reason of settlements and development: it makes its layout special and unique and, on the other hand, its presence represents a great resource and a focus point for many activities. The intervention carried out right now here, as the ones in the port cities all over the world, includes the integration between traditional marine uses to preserve the place's function and additional publicly accessible activities. What the desk and observational research on field pointed out is a shortcoming in creating a direct connection, more than a mere visual and static experience, in which the water is more than a background landscape or a natural element that can be appreciated only by the eyes, from afar.

Observations conducted by the Author in the city, along the rivers of Shanghai, demonstrated the tendency and the enthusiasm of the inhabitants in choosing the waterfront to do activities that belong to their daily life. What is missing is the presence of public spaces that could host these activities, where the dwellers can stop, despite weather conditions, and experience water in a different way from the current visual one, taking advantage of its restorative power, gain awareness of the value of this natural element and experience its positive effects on human's mood.



01.



02.

**Figure 1.** The Ideal Feng Shui Model in the Ancient Feng Shui text  
Source: 'Application of Feng Shui principles to major cities in the world,' by M. Y. Mak, p 86, University of Newcastle, Australia.

**Figure 2.** *Fishing on the River*, Liao Pei  
Source: [www.paintingschinese.com](http://www.paintingschinese.com)

As widely explained in the next chapter about the presence of water in artificial environments, according to the literature review, the restorative power of water has been argued in different fields by many professionals; however, it seems that what is still missing is an application of all these findings in small scale projects such as interior design.

As a consequence, the problem found is in the lack of experiencing water by Shanghai's people and the absence, in the city, of some public spaces in which the approach to the water can be partially or totally immersive, disconnecting from the stress and reconnecting to the environment, simultaneously.

The purpose of this work is to go through this problem and investigate how to (re)connect Shanghai's inhabitants to the water, intending it as the key element that has favoured such a fast and incredible development of the city.

The research takes into consideration the benefits of a possible contact with it among people who live in a big metropolis such as Shanghai and aims to find new ways to establish a closer contact with it.

Some research questions have guided the study: the whole research has been carried out in order to answer them and the answers have constituted a strong base for the following project.

The macro area to which the questions belong is the relationship between the inhabitants and their city environment, more specifically the (re)connection between them and the water because of its decisive role in the development.

**H**ow can contact with water re-establish a connection between Shanghai's inhabitants and the city environment?

**H**ow can contact with water be established providing an experience different from the current merely visual one?

**H**ow can this experience be inserted into a publicly accessible space used by Shanghai citizens in a recreational way?

## 1.3 OBJECTS, POSITION AND SIGNIFICANCE

The main object of the research is water as a natural element that characterises the urban landscape of port cities such as Shanghai. The study started with a focus on the waterfront, as the place where the artificial environment meets the water, as the main reason that has favoured the development of harbour cities and as the opportunity for people to experience this natural element.

Gradually the attention has been moved on to water itself, on to its psychological restorative power and its physical characteristics that play a positive role in people's perception and reactions. The main focus is on all those intrinsic natural factors such as the texture, the sound or the colour, that according to scientific theories are relief for people, especially the ones surrounded by a hyper-connected environment.

Both the whole research and the latter project are aware of the dual essence of the water, as a source of life but also of destruction, as a mean to arouse a positive mood but at the same to frighten people. However, this study wants to take into consideration only the positive vision and perception of it, the therapeutic effect which comes about by its proximity and interaction and the social benefits widely shown in the research conducted until now.

In the following design project, water becomes a design element, the main character of a spatial experience that takes place in a publicly accessible space.

The position of the study is in between scientific theories and empirical studies about water and architectural projects that involve water as a design element. Looking more deeply, the current work embraces the investigations on the positive effects of water on people's psyche and, on the other hand, refers to many architectural and art projects, of different scales, in which water has been interpreted in order to be experienced in a different way to the usual one, not necessarily visual.

This thesis intends to support and promote an integration between water, as a design element, and interior design. According to the literature review, a limited attention to the application of all these findings about the benefits of water in interior environments has been revealed: it appears that the majority of such studies have been conducted in relation to healthcare facilities or theories not considering this element as a possible component of public interior spaces.

This, added to a direct observation leads to the significance of the study: the aim is to provide a solution, applicable in the (urban) interior design field, in which water is used as a design object in accordance with all the findings that prove its positive effects on human behaviour.

My experience of water in this city, my curiosity and my addiction to it have generated a base to my intention of creating a tribute to this element: small, immersive architectural interventions in the urban layout of Shanghai that could disconnect inhabitants from their overcrowded environment giving them the opportunity to stop and restore near the water.

## 1.4 METHODS AND THESIS STRUCTURE

The thesis is the result of two phases of investigation, a theoretical one, the desk research and an applicative one, the design project.

The preliminary desk research, including the background and a preliminary literature review aimed to investigate the main topic of the relation between water and cities in a more general way. It confirmed the reasonability of the problem stated, helped in the formulation of the research questions and gave to the Author a wide and basic knowledge about the topic.

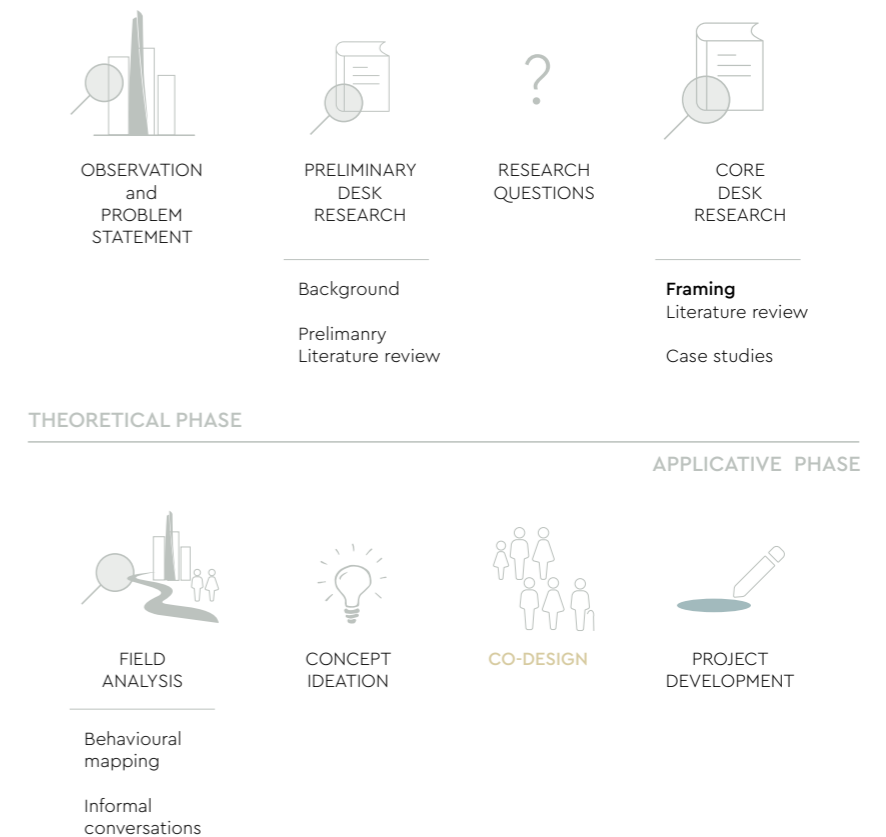
Once the research questions and the goals of the study were clear, the core desk research started, rather the main literature review, a deeper investigation of the key elements related to the subject, and a collection of case studies.

The case studies selected provide a general overview of which kind of projects have already been done in this field, coherently with what the literature review pointed out about the relation between water, people and the space. Considering their variety, they have been divided into categories and, on the other hand, being aware of their complexity in touching different topics, they have been evaluated singularly through a radial graph and, according to a comparative method, ultimately put together so as to obtain some evidence regarding the main gaps in their design.

What is pointed out in the whole desk research laid the base for the choice of the site in the city of Shanghai; once selected, the second phase of this study, the project ideation and development started.

The field analysis conducted on site includes user analysis and behavioural mapping through direct observation of the Author and informal conversations with the future users of the space. Lastly, the insights collected, together with the main findings of the desk research, have been used to generate a concept, coherent to what observed and learnt previously. A co-design session followed in order to validate the hypothesis made by the Author during the concept creation, to gain possible new ideas and feedbacks and understand the interest of people on topic so as to be sure to design a project not only to change the significance of the space but, as much as possible, oriented on users' needs and preferences. Once the second phase of insights collection ended, the concept was modified, according to the information obtained, and developed.

The structure of the thesis follows the process above explained. Chapter one is a brief introduction that aims to interest the readers about the topic and give them some general guidelines about the whole study. Chapters two and three constitute the core of the research, respectively the background and the literature review in one, and the collection of case studies in the other. Conversely, Chapters four and five represent the practical phase, respectively the field analysis and the project. Each chapter is divided into paragraphs and contains a brief section of conclusion so as to summarise what stated along the different sections of it. The last chapter, the number six, contains the conclusions and some considerations done by the Author related to the possible future implications of the research and the project.



Phases and methods diagram  
Source: The Author

## 2 THE PRESENCE OF WATER IN AN ARTIFICIAL ENVIRONMENT

Considering the studies carried out on the relation between the presence of water and artificial environments, Chapter two aims to insert, through a background research, the case of the city of Shanghai within this topic. It follows a section related to the literature review conducted on this frame with a particular focus on the positive effects that water has on humans' mind in the urban contexts and the consequences of its presence for our psyche.

### 2.1 SHANGHAI: A DEVELOPMENT STRICTLY RELATED TO THE PRESENCE OF WATER

All the cities originating and expanding nearby water such as a river, a spring or the sea, have changed their way of considering and approaching this element over the years of their development.

Phases of Shanghai's growth, as many other water cities, were dictated by different ways of looking at this presence and its role for people and settlement. Water started being intended as a limit, used as a means of protection, later becoming a way of communication and trading, allowing opening and interaction to and with other countries and cultures. The fast progress achieved thanks to these foreign contacts has led, today, to a new stage of renovation to both conserve and enhance urban liveability where water is meant to be part of leisure time and outdoor recreation.

Shanghai is crossed by the Huangpu River, a tidal river located to the South of the Yangtze Estuary. The waterways in the city are all connected to the Huangpu River which starts from the Daishan Lake, ending in the Yangtze River, the first largest river in China and the third in the world, flowing to the East China sea. (Ke, 2014)

Suzhou Creek, once the Woosung river, today, is still the largest tributary of the Huangpu River. It runs in an east-west direction linking the metropolis with the Jiangsu Province, passing through the city of Suzhou from which it took the name after foreigners arrived.

People consider the geography of the city very special because of the presence of these two main waterways that cross the city. What is more, it is argued by some experts of the subject that the position nearby the sea and along the river

make the contemporary city conform, as many of the main Chinese ones, to the Feng Shui model.

For those reasons, the former walled city was situated between the Huangpu River and the Woosung River therefore guaranteeing both of them access to the sea and therefore to international trade, and to the hinterland and so domestic transportation, as shown in the Figure 2, a map from the early 19th century.

The etymology of the word Shanghai is a proof of its strict connection to the water since it was nothing more than a fishing village: in Chinese "**Shanghai**" is made up of two characters, **Shang** (上) that means 'up' and **Hai** (海) 'sea' that together mean "**upon the sea**". Shanghai is also referred to as Hu (沪), a 4th century settlement called Hu Tu Lei, approximately one mile north of the old city. The world Hu derives from a fence-like tool for tidal fishing made of nets and bamboo poles widely used along the waterways of the region by fishermen. (Denison & Yu Ren, 2006)

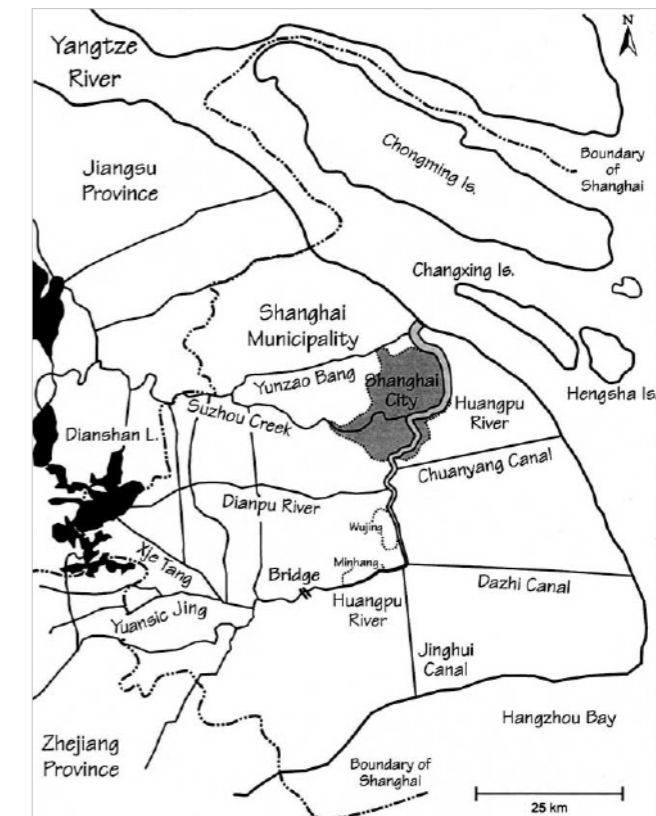
Historically, waterways have always played an integral part in the life and development of the region: early maps of the city illustrate clearly an evident presence of creeks, canals and rivers and conversely an absence of significant roads. Towards the end of the 15th century, Shanghai is said to have become a trading and cultural centre and consequently attracted so much unwelcome attention as to persuade the residents to contribute to the construction of a city wall to prevent further attacks, a decision that changes drastically the development of the city. The circular wall built was 2.5 miles in circumference, 24 feet high and surrounded by a 30 foot ditch. There were four arrow towers, later converted into temples, and six gates: Chaozong (Big East Gate), Baodai (Small East Gate), Kualong (Big South Gate), Chaoyang (Small South Gate), Yifeng (West Gate) and Yanghai (North Gate). Later, to four of these six gates, four water gates were added in order to provide access into and out of the city. Only one, Zhao Jia Bang, traversed the entire city from the Huangpu on the east side; the others, five major creeks and many smaller tributaries were within its limits.

The waterways were the core of all the movements around the ancient city so much that all the footpaths and roads tended to follow their lines. Moreover, many street names were inspired by the name of the creeks, waterways or bridges they were following or crossing or by the trades and the activities conducted in that street such as Fish Street and Fruit Street. Unfortunately, by the early 20th century, because of many problems caused by their presence and the deteriorated condition, the city's waterways were filled in or covered over and replaced by roads. (Denison & Yu Ren, 2006)

It became the site of foreign mercantile houses and of the first buildings with a foreign architectural aspect built by foreign firms. Many businessmen arrived from all over the world making the golden era of the Bund start until the moment when it was known as the Oriental Wall Street due to the construction of many foreign banks following the establishment of the British Oriental Bank in 1874. In the meanwhile the Bund area, the riverfront, gave many primacies to Shanghai: on December 18th 1865 the first gas lamps were switched on in China on Nanking Road and on July 26th 1882 fifteen arc lights shone in the Bund and in China for the first time. The Gutzlaff Signal Tower established on September 1st 1884 in order to offer weather forecast services to the port represented a remarkable landmark strictly connected to the water city and the port, essence of the city. (The Bund Historical Museum)



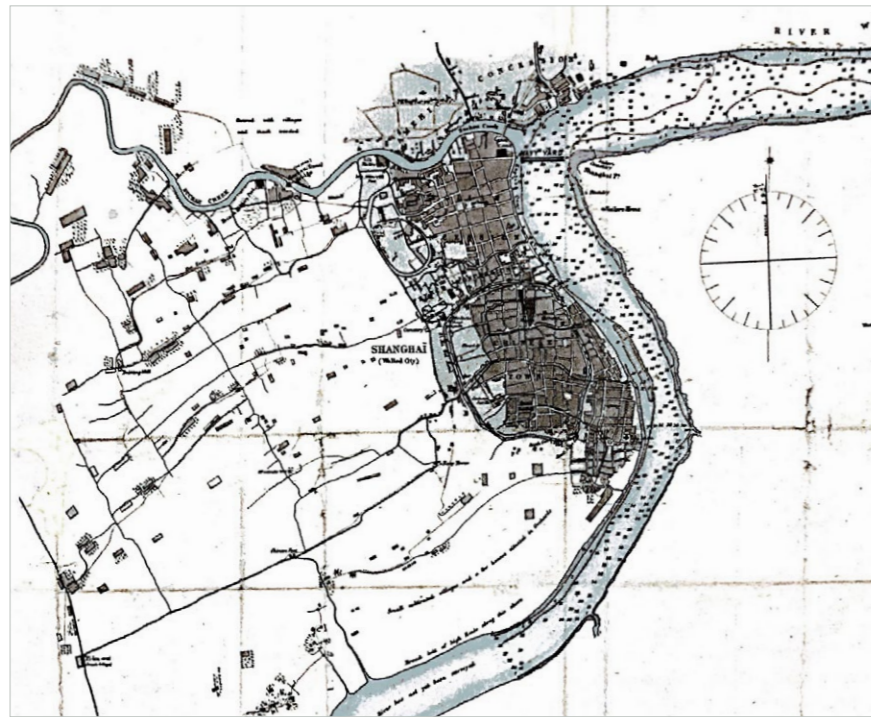
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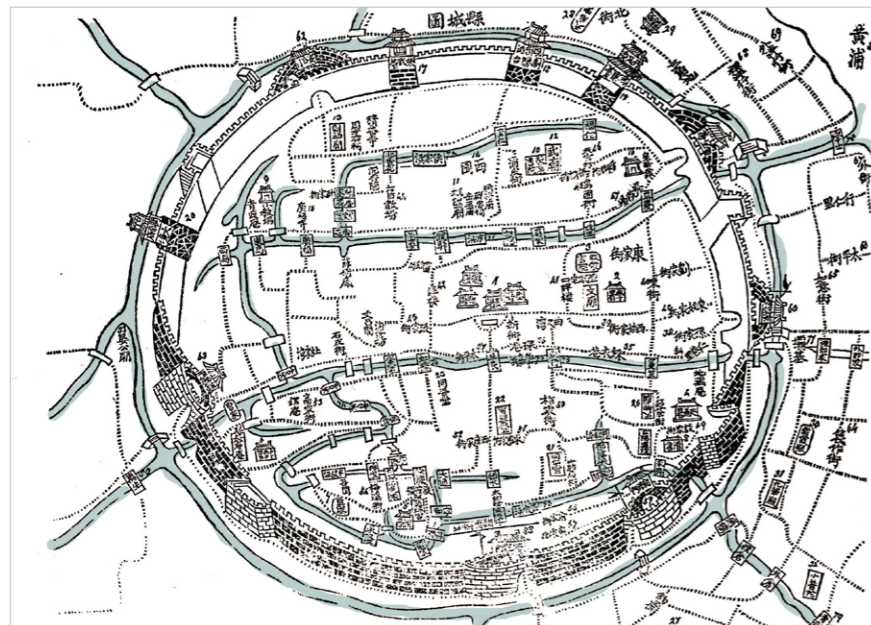
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Figure 03. Location of the two longest rivers in China  
Source: The Author

Figure 04. Map of the Shanghai municipality and the Huangpu River system  
Source: Riadapted from *Water Pollution Control - A Guide to the Use of Water Quality Management Principles*, by R. Helmer and I. Hespanhol



05.



06.

Figure 05. The walled city of Shanghai in a map of the 1862 showing the the Huangpu and Woosung River.  
 Figure 06. Map of the walled city of Shanghai showing the waterways, gates and streets. Source: Riadapted from *Building Shanghai: The Story of China's Gateways*, by E. Denison and G. Ren, 2006, Academy Editions Ltd

Together with the urban facilities, already present in the Western and Japanese cities, the foreigner settlement brought a new way to distribute drinkable water. In 1883, the first water conveyance company was established in China, in the city of Shanghai representing, on one side, an example for many other companies later emerged, and, on the other side a new relation with drinkable water before drawn from wells and waterways, carried manually and sold in different parts of the city. (Yisan, 2008)

As soon as the foreign presence was settled inside the city and the contacts with the other countries had been established thanks to the presence of many waterways, Shanghai faced an incredible industrial growth.

By the 1930s, the total amount of factories in Shanghai had exceeded 50% of the total in China. In 1949, Shanghai resulted to be the largest industrial city in China with over 10,000 factories, most of them located to the north of the Suzhou Creek and on the west bank of the Huangpu River. (Zhang, 2006)

In fact, due to the lack of rail and road transportation, waterways remained the most reliable way to move both goods and people and so support the fast growth that was occurring in the city after the Opium War. For this reason, the consequent decrease of costs for shipping and for the need of proximity to water by manufacturing processes such as cotton textile mills, many factories were built close to the river. Thus, for more than a century the Huangpu River remained the core of the economic and industrial development of the city, until the end of the last century when a process of relocation started. (Yu, Li, & Shu)

The huge presence of factory buildings, warehouses, wharfs and shipyards started to be seen, on the one hand, as a waste of potential land for social activities, on the other, most important, it brought with it a deep ecological degradation. As a consequence, the industrial functions were moved into more suburban areas and many of the pre-existing buildings, mainly warehouses and transportation or utility related structures, were designated as buildings to preserve. Hence, a phenomenon of reuse of this industrial heritage along the Bank of the Huangpu River started following the guidelines provided by a "Leading Office for Development along the Banks of the Huangpu River" set up in 2002 by the Shanghai Municipal Government. The overall development objectives consisted in the adjustment of the industrial structure and improvement of the environmental quality of the waterfront areas while respecting the goal of preserving the cultural heritage of the city. (Yu, Li, & Shu)

Nowadays, the water network inside the city is still the densest and the most developed in China and still characterizes the general layout. The Huangpu River runs through the city zone not only contributing a lot to the city's transportation but also dividing, and at the same time, joining together the centre of Shanghai into two areas, Puxi and Pudong, the old and new Shanghai.

Puxi (the west side) and Pudong (the east side) are characterized by two different types of architecture and attractions; Puxi hosts the main touristic attractions such as the Bund, previously mentioned, and the old concessions while Pudong is the financial district characterized by urban monuments and skyscrapers associated to the image of the city worldwide. (Rowe & Kuan, 2004)

Since the early nineteen eighties, the master plan of the city showed the possibility of extending part of it in the Pudong area, changing the role of the River within the fabric of the city. In 1990 the regeneration of the entire area along the river became a big issue, and the idea of involving both sides of it the main



07.

Figure 07. Shanghai, the Bund in the 30s  
 Source: [www.spacing.ca/toronto/2009/04/08/past-and-future-on-shanghai%E2%80%99s-famous-bund/](http://www.spacing.ca/toronto/2009/04/08/past-and-future-on-shanghai%E2%80%99s-famous-bund/)

focus. The new schemes were suggesting the introduction of the waterfront as the core of the social and cultural life of the future metropolis, leaving to the past the previous degraded and polluted environment along it. The main aim was to re-build both physically and visually a link between the city and the water. When, in 2000 the Shanghai Urban Planning Committee asked SOM, Sasaki Associates and Philippe Cox to develop new ideas in order to improve four core areas along 20 kilometres of both sides of the riverfront between Yangpu and Nanpu Bridges, the interest of making places along the water new civic public spaces became widely clear. In the meanwhile, many interventions to better the poor environmental quality and accessibility of Suzhou Creek occurred demonstrating the increasing interest in returning to the city of Shanghai and its citizens its powerful water. (Rowe & Kuan, 2004)

In addition, the opening of the Shanghai Expo 2010 led to a considerably common phenomenon among port cities that exploits the great temporary events for re-installing a water culture in the inhabitants' routine. (Akhavan, Study of Public Spaces Along Waterfronts in Changing Harbor-cities in Europe: Barcelona, Genoa and Lisbon, 2011)

A series of renovation projects were initiated in the early 2000s considering the waterfront and so the water as an element that could contribute to enhance the quality of urban life but also to strengthen the city identity reaching a balance between the economic development and cultural conservation.

This brief timeline of Shanghai proves how much the eminence of the city is related to the presence of the water and the traces it left. What the following chapter underlines, according to a general overview on the tendency to regenerate waterfronts and the analysis of some specific cases of interventions along the Huangpu riverfront, is the contemporary willingness of the city of Shanghai to re-establish a connection between itself and the inhabitants, putting this element at the centre and providing a conservation of the memory at the same time.



## 2.2 SHANGHAI'S RIVERFRONTS: RENOVATIONS AND RECREATION

The restorative power of water, its ability to disconnect city dwellers from the stress of the built up environment in which they live turned the interest of urban planners to waterfronts for their revitalisation. Cities' waterfronts represent the encounter between water and land, they are the places where nature encounters the artificial environment, they are as dynamic as all the potential activities that could be conceived and designed there. For this reason, they started to be seen as spaces in the city where the restorative potentiality of water meets peoples' needs, where architecture and scientific knowledge on the effects converge.

Since the 1980s a trend in the redevelopment of these areas in the cities all over the world has taken place bringing a dramatic shift in the use of urban waterfronts from industrial ones such as shipping, storage and shipbuilding to sites for preservation, education and recreation introducing in them the concept of social and time dimensions. In addition, when analysing the social dimensions of waterfront regeneration the degree of water dependency is significant; it could be a water-dependent use if the waterfront location is indispensable, a water-related use when the advantages of the waterfront location are maximized and a water-independent use, neither dependent nor related to the waterfront. (Sairinen & Kumpulainen, 2005)

They become places where people experience recreation and water, but how strong the contact with the water is in these renovations can be evaluated basing on a classification according to three main functions in which public spaces are divided into: promenade/sidewalk, park/garden and waterfront piers. A promenade or sidewalk along the waterfront is the type of space that provides a direct visual connection to the water; usually, on the other side of the promenade there are offices, commercial or housing buildings and restaurants and shops when the promenade is part of a leisure or tourist attraction. Promenades may also be part of the green areas like the parks or gardens. The aim of the latter is to provide a greener environment, to offer wide, natural, open spaces. On the other hand, waterfront piers are an extension of the waterside area which with their different structures host many functions from fishing to exhibitions including sometimes even shops, restaurants where the optical contact with the water is stronger. (Akhavan, Study of Public Spaces Along Waterfronts in Changing Harbor-cities in Europe: Barcelona, Genoa and Lisbon, 2011)

In this big shift in the conception of the waterfronts it is necessary to take into consideration the role of great temporary events that have driven a re-installation of the water culture into the inhabitants' routine. (Akhavan, Study of Public Spaces Along Waterfronts in Changing Harbor-cities in Europe: Barcelona, Genoa and Lisbon, 2011)

Among all the cases all over the world, the city of Shanghai is included; here a series of renovation projects was initiated in 2007 to retrieve a pedestrian-friendly waterfront space and celebrate the opening of the Shanghai Expo 2010. This fact represents an emblematic example of how, in Asia, the waterfront spaces have been central to the economic, social and cultural development of the cities themselves. Furthermore, it explains clearly how, after a rapid economic growth, the Asian cities started facing a new stage of urban renewal focused on en-

hancing the urban liveability and its inhabitant's life quality. The specific case of Shanghai proves also helpful for understanding the big challenge of Asian urban planners in finding a balance between the re-use of these areas while preserving their historical characters. Here, since the beginning of the renovation it proved necessary to understand how to reach a balance between economic development and cultural conservation of the Bund: a waterscape famous all over the world, symbol of fast-growing prosperity. (Yu C. , 2009)

In Shanghai, as mentioned in the previous section of this chapter, an incredible phenomenon of industrialisation along the Huangpu River occurred from the middle of the 1800s, characterizing deeply the use and also the aspect of Shanghai's riverfronts and so, later, their renovations.

The increase in outdoor recreational activities such as walking, jogging or cycling in Shanghai and the consequent wish to renovate the waterfront of the city occurred simultaneously with the start of that process that has seen the involvement of architects and urban planners for the conservation and the adaptive reuse of the industrial heritage of Shanghai. (Yang, 2017)

With industrial heritage we intend all those remains that belong to an industrial past, rather "(...)buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transportation and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education". (Zhang, 2006)

The consequence is that from the beginning of the 20s the regeneration of these areas began to be connected to another main issue: increasing the recreational activities spread out in the city through the presence of the water.

### 2.2.1 East Bund: River View Service Stations by Atelier Z+

The area of the East Bund is a post-industrial land along the eastern bank of the Huangpu River, in the Pudong area, where the phenomenon of regenerating post-industrial sites giving them over to creative industries, common of different zones of Shanghai, occurred more than in other locations. (Li Y. , 2012)

Many adaptive reuses have been designed by big firms transforming the pre-existing buildings into places devoted to art and creativity, such as museums and theatres.

This is the case of Shipyard 1862 by Kengo Kuma who transformed a disused shipyard into a theatre and retail outlets. The building built in 1972 was the last factory existing in Lujiazui where massive ships were built and then delivered directly using the river. (Stevens, Kengo Kuma transforms Shanghai shipyard with gratuated brick facades, 2018)

Similarly, some kilometres away, OMA studio unveiled in 2014 an exhibition and events venue suspended above a public plaza along the same side of the river. It is positioned on the ramp of a former ship cradle, within an area known for its long shipbuilding history. (Stevens, OMA competes elevated exhibition venue above a public plaza in Shanghai, 2017)

The Chinese studio Atelier Deshaus is protagonist of these same types of renovations with two of its three projects placed in the East Bund such as Shanghai Modern Art Museum and the renovation of an 80,000-ton silos on Minsheng Wharf, and one, on the West side, the Long Museum. (Allen, 2018) All of them

joined by the idea of preserving the materiality and the building's spatial qualities, providing to the visitors the experience of an impressive scale that hosts artworks.

It is in this context that the East-bund "River Viewing Service Station", a series of service stations located in the linear public space of the riverfront, were built. The project includes 22 stations that provide citizens with rest spaces and public toilets, distributed one every kilometre on the entire east coast between Yangpu Bridge and Xupu Bridge.

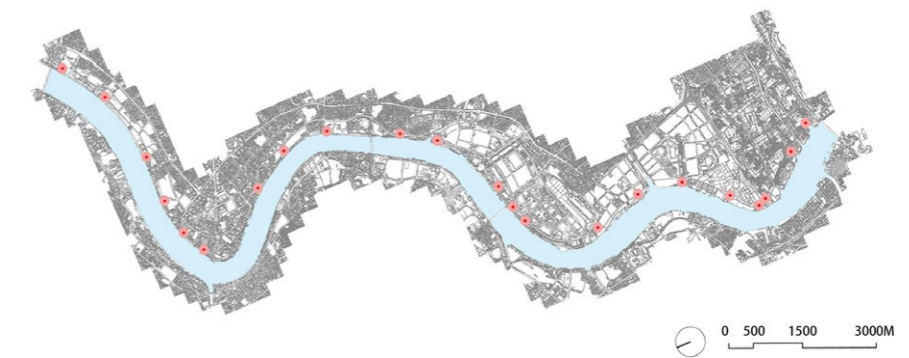
The project started from the first River Viewing Service Station completed in September 2017 at Lujiazui northern riverside and the renovation and design of the second River Viewing Service Station completed in December 2017 in Qiantan Leisure Park.

Within this system of renovations along the East Bund, the concept of the River view service stations responds to the contemporary attitude of Shanghai's dwellers in doing open-air activities, including especially the riverfront. For this reason, these pavillions are collocated in the linear area in between the walking path and the running/riding path, both along the waterfront, aiming to connect them. The spaces, meant to be places to rest and stay, were created with the goal of returning the river to the people. The consequence is a relationship among microscopic sites and macro public spaces where these micro buildings become urban landmarks, scenery amplifiers that serve citizens daily and simultaneously increase the possibility of public interactions, as declared by their name. (AtelierZ+, 2018)

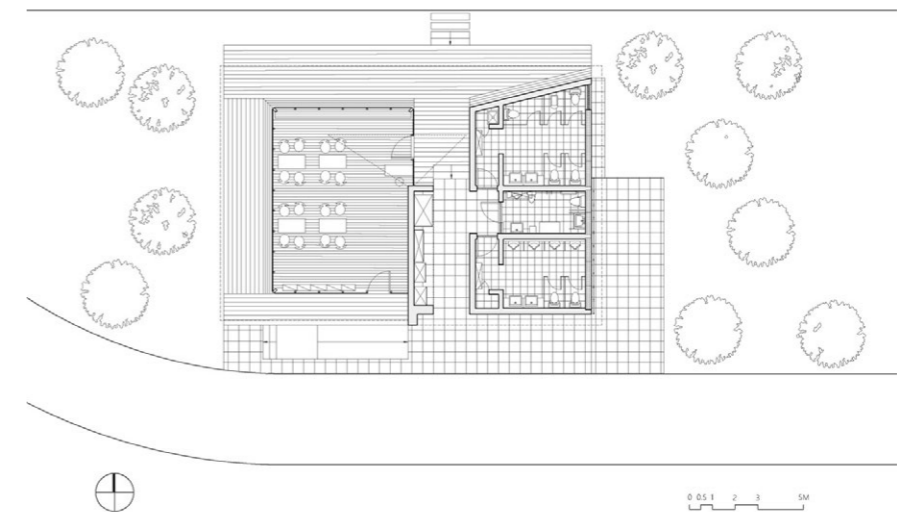
These pavillions, beside their function, are interesting for the appearance and the building methods adopted. The River Viewing Service Stations have been thought as following the principles of emergency projects leading to incredibly high-speed realisations: the first two took one and a half months from scratch to the completion respectively, the total design and construction period of the last 20 was only two months.

Once all the different possible land types were analysed, according to many site conditions, and classified, a common shape and a standard structure made of a steel and wood hybrid system were designed. The main use of steel and laminated wood was chosen in order to achieve a very fast construction controlling the quality as much as possible. Moreover, the dry construction and the high prefabricated rate contributed to have a little impact on the environment making the project very powerful even from an engineering point of view.

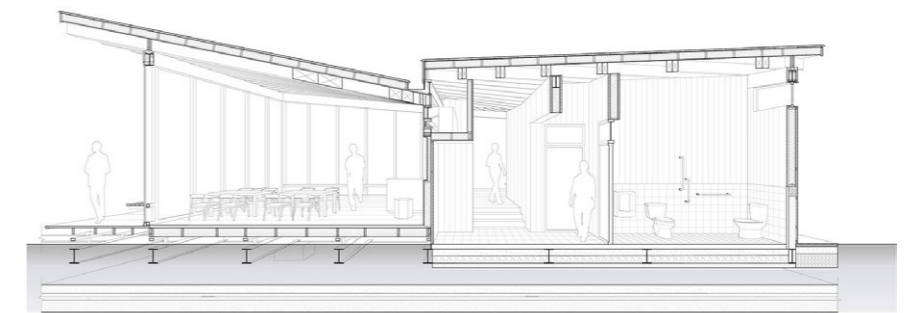
The elevation of the buildings tells clearly what the plan reveals: each station consists of two parts, a relatively closed public toilet and an open and transparent public lounge with many facilities. The transparency of the glass allows people to enjoy the view of the water creating a direct visual contact with it. Between these two areas there is a covered corridor that hides other facilities and properly connects the above mentioned patch at the back of the river and the walking one on its side. Here users can find vending machines, lockers, hot and cold drinking water, shared umbrellas to add to the bookshelves full of books and information guides, a big screen, tables, chairs and a boiler placed inside. The pavillions stand on a wooden platform, in order to strengthen the idea of a volume in the public space, and long benches, made of the same wood allow people to stop outside and to enjoy the river-view in the open air. (AtelierZ+, 2018)



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Figure 08. Location of the 22 River View Service Stations along the Huangpu River

Figure 09. Sample plan of one of the River View Service Stations

Figure 10. Sample perspective section of one of the River View Service Stations

Source: [www.archdaily.com/909211/river-view-service-stations-atelier-z-plus](http://www.archdaily.com/909211/river-view-service-stations-atelier-z-plus)



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Figure 11. River View Service Station n.5  
 Figure 12. River View Service Station n.3, interior view  
 Source: The Author

What makes this project interesting for this study is, first of all, the aim that moved its creation, that is the will of reconnecting people to the presence of the river in the city through a space where they can stop and stay for, mainly, a short time, which could host recreational activities. The project itself and the current use of these spaces confirm the interest among Shanghai's dwellers in having places for recreational activities that take advantage of the presence of the water and its benefits.

However, the position and the architecture itself confirm the absence, even in the newest projects, of a relationship with the water that happens near it, not only visual and static.

## 2.2.2 Shanghai's water system: level and quality

A walk along the riverfronts of Shanghai allows one to experience the physical obstacles between people and water: it is a fact and there are different reasons that stand behind it.

Shanghai is a flat land, the average elevation is WD 3m-5m, with an exception of small hills in the west part. WD, namely Wusong Datum, stands for a value that corresponds to 1.924m lower than mean sea level of the China Yellow sea, a reference widely used in China. According to this value, the entire area of Shanghai can be divided into four main types of terrain. If we draw an imaginary cross section of the city from the West to the East it is possible to see the differences among these areas and it results evident that the inland part, and so the built-up one, is relatively lower than the coast side.

What is more, Shanghai is vulnerable to flooding because of its geographic location, flat and low-lying terrain and land subsidence. To these facts should be added the climate conditions of the country in general and the change that is causing storm surge events and typhoons, being one of the main reasons of flooding. Generally speaking China has access to a huge quantity of water; however, according to different regions and their geographical positions, the hydrological conditions are different: in the Northern and Central regions, including Shanghai, the water descends from steep mountains bringing, at flood periods, millions of cubic metres of water rush into river beds. (Spicq, 2008)

As a consequence, along the riverfront, floodwalls have been built in order to contain the high flood risk and solve the current different level between the built-up areas and the water. (Ke, 2014)

Sea dykes to protect the coastal area from the primary flood, drainage pipes and pumps within the urban area to avoid water-logging during rainstorms and two different types of floodwalls, respectively along the Huangpu River and along the remaining waterways, are the four main methods used in the city. A floodwall consists of a permanent vertical barrier designed in order to contain a temporary changing level of water, mainly due to weather changes. Usually they are used in cities or in places, like Shanghai, where, in general, the space is small and there is the risk of interfering with pre-existing buildings. The majority of the floodwalls in the Huangpu River are made of a concrete wall, steel elements and a basement.

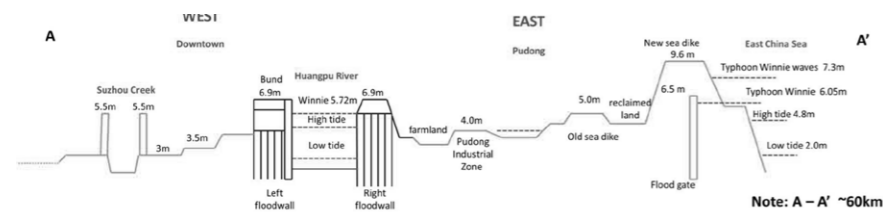
Thus, the lack of space and the necessity of controlling the level of water getting higher has led to the covering of many parts of the riverfronts with these structures; simultaneously, the increasing necessity of creating public open spaces

along the rivers has added a recreational aspect to their main function. In fact, many of the gathering areas, tourist points and walking paths along the Bund are nothing else than floodwalls open to recreational activities. (Ke, 2014)

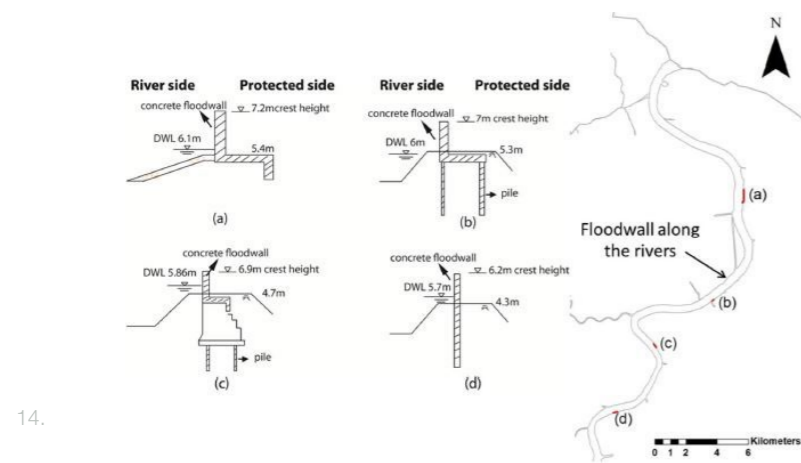
The positive side of this tendency is that the connection with the water has not been deleted at all, but, on the other hand, the main issue that could be stated is that this relation is merely visual and not so direct because of the physical obstacle that stands between the person and the natural element.

The absent contact with water due to the presence of the floodwalls along the riverfront was already pointed out by SOM architects when, in 2000, they were involved in a new urban design study for both sides of the River. On that occasion they proposed the creation of an access to the water through raising the land therefore eliminating the need of a pre-existing three-metre-high floodwall, at that time considered a physical and visual obstacle to the water. (Rowe & Kuan, 2004, p. 163)

This was the starting point for all those riverside-flood control projects that today in China, after the huge urban expansion of the cities, seem to be one of the most common public landscape types of design. Usually they are constituted by a large plaza, or big areas for gathering, and linear promenades where contact with the natural element is more direct. (Padua, 2008)



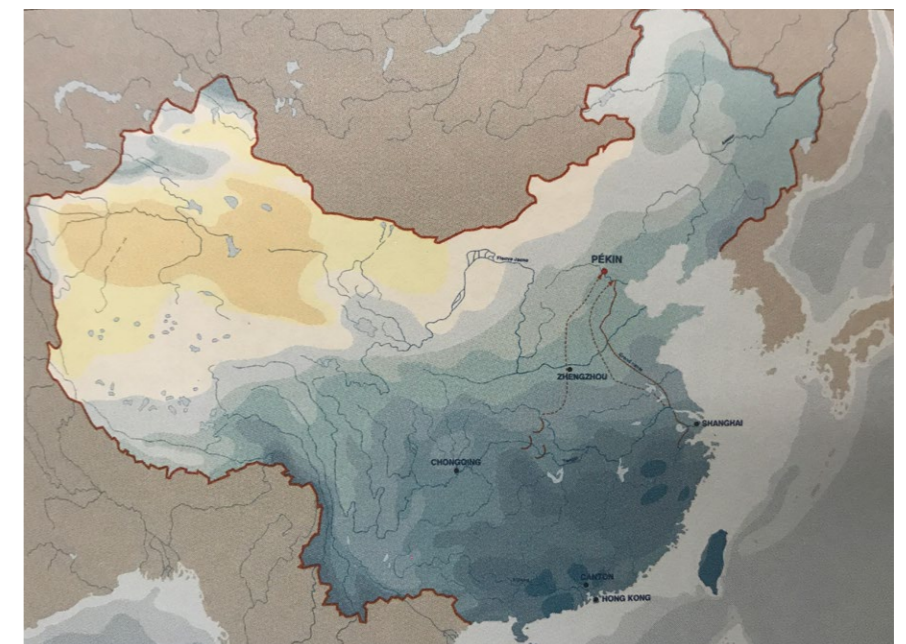
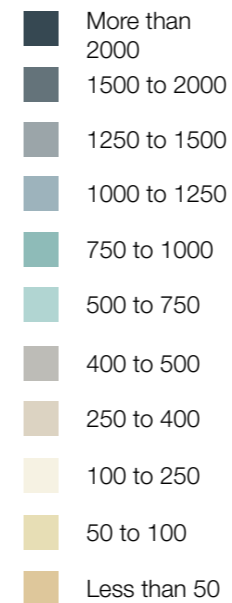
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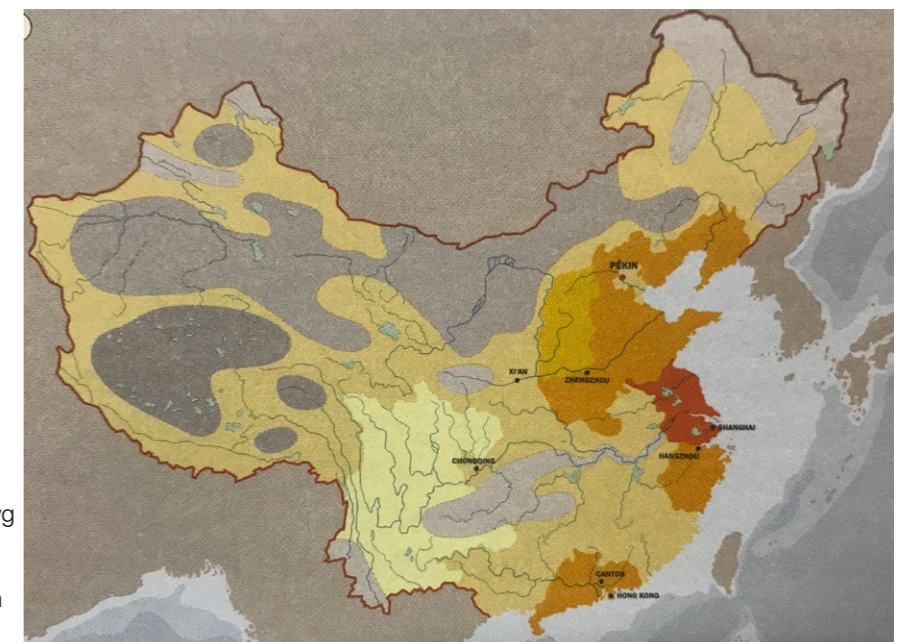
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Figure 13. Schematization of cross section of Shanghai city from West to East. Source: : Flood risk analysis for metropolitan areas – a case study for Shanghai (p 12), by Q. Ke, 2014, Delft, NL: Delft Academic Press

Figure 14. Cross section of floodwalls along the Huangpu River in selected parts. Source: Flood risk analysis for metropolitan areas – a case study for Shanghai (p 26), by Q. Ke, 2014, Delft, NL: Delft Academic Press.



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Figure 15. China's water sources and yearly precipitations in millimetres  
Figure 16. China's threats towards the natural equilibrium and biodiversity  
Source: In the Chinese city: perspectives on transformations of an empire (p. 139,154), by F. Edelmann, 2008, Actar.

According to the national water quality scale of I to V, currently, the degree of the Huangpu River varies between III and over V. All the values lower than III mean potable water and V, the poorest in the country's values, represents a risk for the people that enter into contact with it.

A study conducted in 2006 on the variations of the water quality in Shanghai over the years showed a close relationship between the increase of the negative values and the urban development: the higher the urbanization was, the lower levels of surface water quality were reached. In particular, following a classification of the urban texture of Shanghai in three main kinds of areas, urban, suburban and rural, it appeared that integrated pollution index for urban areas increased in 1980 decreasing in 1990. Conversely, in rural areas, it has risen significantly in recent years. This trend seems to follow the relocation of factories settled along the waterfront that occurred at the end of the 90s, confirming the damages that the industries brought to the water and the city. Thus, the use and the relation with water resources is strongly limited by its quality.

Fortunately, sustainable development in terms of water quality have become a focus in Shanghai's urbanization, marking a new developing phase: after pollution, treatment. (Wang, Da, Song, & Li, 2008)

The case of the Expo 2010, the urban intervention conducted because of the imminent world exhibition and the focus on how to increase people's life quality respecting the natural environment as much as possible are clear examples of the purpose of re-establishing a deep relationship with water, making its quality better and enhancing a more direct and dynamic contact with it.

The pre-existing area was highly contaminated: the Bailianjing River, an important tributary of the Huangpu River, located in the park of Expo, in 2008, proved to be impacted both by residents' pollution and industrial waste. (Yan, Lu, Wang, Liu, & Yang, 2008)

Within the park, the project of the Houtan park is a good case of how the problems of water has been faced. In fact, one of the main challenges for the architects was to deal with the flooding issue and the pollution; they were able to create a public open space where the contact with water was safe, healthy and as direct as possible. (Yu K. , City green: Landscape as a living system Shanghai 2010 Expo Houtan Park, 2015)

### 2.2.3 Expo 2010

As already explained in the section about Shanghai's riverfront, the World Expo exhibitions are, in all the countries where they take place, a reason of development and renovations for the city itself; in the case of port cities or locations where there is a waterfront, the tendency is to involve this area as much as possible, usually adding many facilities. The case of Shanghai confirms and strengthens this phenomenon.

The Expo park of Shanghai 2010 was set in two main areas along the Huangpu River, respectively, in the Puxi and Pudong sites.

The location of the park on the map makes easier to understand why this intervention can be inserted into a general discussion about the regeneration of waterfronts in Shanghai, in particular within the tendency of "re-building" the city

acting on the pre-existing industrial areas and structures, once along the water, and improving the environment quality involving the water. (Yu, Li, & Shu, p. 6) The theme of the Expo 2010 was "A Better City, A Better Life", with a particular focus on the sustainable development of the cities in the future, on how to achieve a balanced relation between them and nature in building and consequently the increase in people's life quality. For this reason and for the many records that, at the end of 2010, this World Expo resulted to have reached, it represents an important moment of development for the country in general: the largest number of participants and visitors ever, the largest number of pavillions and the hugest number of publications related to it were achieved.

Because of this event a big transformation in the city occurred, a great number of constructions were built or renovated in order to upgrade their quality even if the main area involved was the one of the Expo Park, the largest park built for this event until that moment, a small city inside the city. As all over the world the majority of the constructions created on this occasion within the park, after the World Wxpo, stayed and their function was re-thought, the others were demolished or damaged and abandoned, but what stayed are all the interventions made around the city, in particular the ones on the waterfront that represented a starting point for the ones that later occurred. (Shiling, 2010)

In this context, water was one of the key elements of the design together with air, soil, energy and materials; in fact, the whole project was meant to be coherent to sustainable principles, and so to the general theme of the event so as to guarantee high environmental performances. (Dong, Zhang, & Ruff, 2010)

If referring to waterfront, its regeneration from a restorative point of view inside the area of the Expo, it is meaningful to do a brief overview of the Houtan Park, already mentioned above and analysed more deeply in the Chapter four. Houtan Park, one of the central green spaces in the project, one of the three parks on the whole site, covering a 140,000-square-metre surface in the southern area, was meant to be not only an ecological space for the exhibition but also a flexible open public waterfront space. It was built where a former steel manufacturing factory and boat repair facility used to be, with the objectives of integrating public activities in a degraded area while preserving it. (Yu K. , City green: Landscape as a living system Shanghai 2010 Expo Houtan Park, 2015) The water treatment created inside, the consequent living system generated, thanks to the better quality of the water, and the curiosity demonstrated by people that can touch it, represents a demonstration of the invisible relation between people and the water body in Shanghai.

The focus in a previous polluted factory area, the placement of recreational activities there and the attempt to integrate and connect both banks of the River are reasons of inspiration for this study. (Chen, Su, & Tu, 2014) They constituted a starting point for the next steps of the research and a strong base for the future application.

***"The landscape plan of the Expo aims to establish an ecological corridor along the banks of the Huangpu River. By doing this, it wants to bring the city back to the river, make it directly perceptible and increase people's awareness that Shanghai once used to be a water city."***

*(Dona. Zhana. & Ruff. 2010)*

## 2.3 THE RESTORATIVE POWER OF WATER IN URBAN PUBLIC SPACES

This section is the result of a collection of various research and considerations on people's direct engagements with water, considering it as an element that enters their lives in different ways, many of which involve close sensory interaction.

Today, as Fabio Novembre points out in this sentence and so the architect and design theorist Christopher Alexander noted in the book "Pattern Language: towns, buildings, construction" (1977), in the modern society, the improvements in the technology applied on water treatment and its distribution are making people experience water only through taps and valves, taking for granted the daily contact and its presence. As a consequence, understanding the cycle of water is becoming more and more difficult and our emotional need is not satisfied. (Alexander & Silverstein, 1977) He firmly believes that people need moving and still water. This seems to be related to the theory supported by Gwo Fang Lin in her study "Human Responses to Water Elements in Interior Environments" (2002) according to which biophilia hypothesis, provides a framework for the investigation of the meaning of the relationship with water.

The biophilia theory was coined in 1984 by the biologist, naturalist, and entomologist Edward O. Wilson to describe the genetic connection between humans, nature and the living organisms we share our planet with. (Fang Li, 2015)

Nowadays in our daily life, the connection with water happens, mostly, in built-up environments and it is facilitated by it. We build considering the possibility of inserting water inside the structures following all the several studies that demonstrate the positive effects of nature in artificial environments as a means to foster mood or emotional states and improve efficiency or power of concentration.

According to the research there is good reason to suggest that providing an access to nature in a built-up environment can be beneficial, improve health and provide restoration. However, as a rule, when the restorative quality of an environment is investigated what is put into comparison are built-up environments versus natural ones; this study is focused on the water, rarely explored within these two categories.

But what is namely restoration?

**Restoration** (noun [ C or U ] UK /,res.tər'ei.jən/ US /,res.tə'rei.jən/) is defined, according to the Cambridge dictionary, as "the act or process of returning something to its earlier good condition or position". (Cambridge University, 2018)

Referring to a more anthropological point of view, Veronica Strang, a cultural anthropologist focused on human-environmental relations and people's engagements with land and in particular, water, would say restoration is about play, a way far from adult responsibilities where people take a journey through rebirth and discovery. (Strang, The Meaning of Water, 2004)

Introducing this concept in the architecture field, whatever the scale of the project is, refers to re-introducing psychological aspects that have been underestimated because of everyday life in densely populated cities that have faced a

considerable growth of their artificial environment.

This is the case of China where more and more individuals are moving to and living in ever expanding cities, being affected in their mental and physical health. A study conducted in collaboration with the Psychological Centre, Dalian University of Technology of Liaoning and the Graduate School of Maritime Sciences of Kobe University in Hyogo shows some findings of the impacts of water including oceans, rivers, lakes and so on, on Chinese mood. The questionnaire involved 207 people (121 males and 86 females), randomly selected from a Chinese university, and categorized into three groups according to different levels (high, medium, and low) of experiencing water. According to the results the more frequently Chinese people experience water environments, the better their moods and mental health improve. In particular, a high frequency of experiencing had a more significant effect on mood than did medium and low. The findings also indicate that in both men and women, the water environment has a positive influence. Furthermore, for males, the differences in the results about the mood between the high, medium, and low frequencies were more pronounced and significant than they were for females. What is more, Chinese men identified some water sports they were already doing such as fishing, swimming and surfing as sources to improve their mental health and release their stress. (Peng, Rooks, & Hu, 2018)

More recently and somehow conversely because of their approaches strictly related to a physical space, two other studies were conducted suggesting the recreational value of water for humans.

Bernhart Ruso and Klaus Atzwangerin 2003 chose a shopping mall as the best everyday built location where to conduct a study about the effectiveness of water in an artificial environment on the human psyche and to investigate the change in people's behaviour because of its presence. They installed a fountain in a corridor of a shopping mall and filmed the scene of two different settings, with the fountain filled and with it empty. They found that if the fountain was filled with water, the duration of the stay of the passers-by increased by 21.4 % and, if they could decide, they would prefer to stay closer to the fountain. The fact that they were more likely to explore their environment and to interact with each other demonstrated the power of a water setting as activator of the space and the interactions between it and the users. (Ruso & Atzwanger, 2003)

Later, in 2012, another observational study carried out by Prajal Pradhan in the faculty of Landscape Planning of the Swedish University of Agricultural Sciences, in the major public plazas, squares and parks containing various types of water features in different cities of Sweden and Nepal, demonstrated the influence of water on people's behaviour. It was noted that passers-by stopped much more frequently to look at or take a picture of a site if it had water, in comparison with sites containing only other elements. This was true in both countries and more noticeable if there was a fountain or the water contained fish; especially children were extremely curious about the element and hypnotically attracted to water. Moreover, one of the major findings was that fish in the water stimulated interest, making the water look more attractive and so holding people in the place a comparatively longer time confirming theories that the presence of the fish arouses people's interest to water because their presence adds a sense of naturalness. (Pradhan, 2012)

***"The life of water in modern society is limited to the interval between the tap and the drain, two valves which transform spring water into waste"***

*(Fabio Novembre)*

naturalness. (Pradhan, 2012)

In conclusion, the presence of water in artificial environments, wherever they are, outside or inside, can be considered decisive for humans, changing people's behaviour and their mood.

What should be added to these studies in order to have a more conscious idea of the relationship between humans and water in built-up environments is the "involvement theory" proposed by Goffman in the early 1960s. The involvement theory suggests that humans and animals have the capacity to divide their attention between main and side involvements, where a main involvement is what moves one's attention more, determining one's actions. Conversely, the side involvement is the one an individual can carry out without interrupting or interacting with the main one. (Goffman, 1963)

Considering this theory while studying the effects of water on people's behaviour adds a value to this research: the awareness that the role of the water in the space has to be clear before investigating or designing a place where restoration is caused by the presence of the natural element.

Water is positive for humans in general, but its effects influence the spaces and so humans differently according to the degree of involvement it has in the surrounding.

***"If you've got an area, and there's a pond in it, you can naturally expect most people will gather and walk around the pond. That will be the focal point to go to... nearly always it will be the place that people will go"***

(Strang, The Meaning of Water, 2004)

### 2.3.1 The value of proximity

Waterscapes as a source of fascination and attraction have been pointed out extensively by many scholars, one among all, the environmental psychologist Herzog (Herzog, 1985); it is widely argued that the proximity to water increases the positive effects that natural environments have on people, being particularly effective on human health and well-being. (Völker & Kistemann, 2011)

According to many studies, the view of the water both relaxes and stimulates us and our brains. The results of this influence are not only physical, such as an improvement in physical exercise if done in proximity to water and consequently in self-esteem and mood, but also mental. Even something simple such as walking along a river or observing an aquarium full of life and naturalness generates a flow of creativity; "Water unleashes the uninhibited child in all of us, unlocking our creativity and curiosity".

It is not a coincidence that water has been considered a muse for artists who have always been looking for their locus amoenus to be inspired by water. (Nichols W. J., Blue Mind, 2015)

Talking about the value of proximity means that "people want to see and hear the water from where they eat and sleep", more generally while they are doing their daily activities.

This confirms the fact that people are willing to be and do activities nearby it because of the happiness generated by it.



17.

Figure 17. Cheonggyecheon, Seoul, South Korea  
Source: The Author

The results of the data collected in 2011 by George MacKerron and Susana Mourato through a smartphone app called Mappiness confirmed this. 22,000 participants in the United Kingdom downloaded the free app; they received signals randomly asking them how happy they were in the moment, who they were with, doing what and where. The GPS tracking helped to understand people's exact location. The outcome of this experiment proved what already argued by psychology and science: the relation between the positive mood and the presence of a natural environment. In particular, it resulted that the highest level of happiness was reached if water was present in the environment. (Nichols W. J., Blue Mind, 2015)

Here a brief parenthesis about what happiness means, from a scientific point of view, should be opened in order to understand the effects of proximity to water on our body. The feeling identified by the majority of people as "happiness" is the result of various emotions, each one associated to different neurochemicals in different parts of the brain. Dopamine, related to arousal, motivation and pleasure, gamma-aminobutyric acid, which produces feelings of calm and well-being by slowing down synaptic impulses, serotonin for tranquillity and safety and oxytocin that contributes to our feelings of closeness with others are all "neurochemicals of happiness". (Nichols J. W., 2015)

In other words, when we talk about being nearby the water as a reason of happiness it is never about only one specific feeling but many sensations, related to relaxation, calm with one's self and also with others.

The fact that people agree to pay more for a house or a room with an aquatic view, because of the possibility of looking at or listening to it, is a proof of people's will to be near. Many studies conducted all over the world have pointed out a strict connection between the real estate and the relation the building has with water.

Surely, this is related to the sharp shift on how the presence of water is considered within the urban area, as mentioned before. In the past water was the way thanks to which enemies gained access, so seen as dangerous and mainly for commercial enterprise; nowadays, as soon as waterfronts started to be considered as the places for restoration also the attitude to it changed, including the way in which the proximity of properties is evaluated.

We are looking for environments that can help us to get away from our usual routine, to feel part of something big and great, doing new activities or simply nothing at all and for many this means being nearby water, living by it; not by chance it seems that a "room with a view" on a beach, commands a 20 percent higher price than one without. (Lange & Schaeffer, 2001)

The study conducted by Völker and Kistemann on citizens' attitudes for a riverfront promenade among Cologne's inhabitants, in Germany, not only confirms the attraction people have for urban waterscapes but introduces, as explained in the previous paragraph, the proof that we are willing to experience the water not only in a visual way, we are expecting all our senses to be involved.

It resulted that people were walking on the promenade trying to get as close as possible to the Rhine river. What is more, once they were close, it seems they

***"When you ask people why they like to spend time by water, the usual responses are 'it feels good', 'I like looking at it', and 'it makes me happy'"***

(Nichols W. J., Blue Mind, 2015)

were spending hours only sitting and watching it, being attracted by the movement and the changing colours because of the glistening of the sun on it, letting all the senses get involved as much as possible. People were attracted by the smell and also by the sound generated by the waves coming to the shore or the ships passing by; the contact remains indirect but they let the whole environment enter into contact with them, including the breeze that reminded them of fresh air. (Volker & Kistemann, 2013)

A study conducted in some neighbourhoods in North Utah with the aim of understanding the positive impact of local waterways to households and the possible relation between the proximity and the time spent there, pointed out interesting information about city dwellers' tendencies. According to this research it came out that if the access to the water, including a walking path, was public, people were more likely to spend time walking or playing. If the space is public people become more familiar with the water, even if the proximity itself appears to be not sufficient to enable deep awareness and use of these public spaces. (Haefnera, Jackson-Smith, Buchertc, & Risleya, 2017)

In other words, the nearness to this element generates happiness in people, intended as a series of positive stimuli related to calm and good mood. If the experience of closeness to water takes place in public spaces users spend more time there, they stay and become more familiar, even if not totally aware of the potentiality of the element. What is more, the fact of being in proximity, which may mean viewing aquatic scenes, recalls in people the concept of immersion activating in our brains the good stimuli generated by the real physical immersion.

Immersion allows a very different interaction with the natural environment in general and with water specifically, it involves the whole of our body and mind; being nearby this element is a way to evoke these sensations, even if, of course, is not enough. (White, Smith, Humphryes, Pahl, & Snelling, 2010)

### 2.3.2 The attractiveness of its naturalness: senses and water

As widely discussed above, the natural character of the landscape has been argued by many studies as one of the most important factors of restoration, especially in an urban environment. Talking about water's naturalness does not only refer to the surface extension of the water or its quantity, it is related to all the natural factors that characterise it such as colour, texture, sound, motion, reflection and transparency.

The human response to natural aspects of water is what Jack L. Nasar, Professor of City and Regional Planning at The Ohio State University, and the student Minhui Li, investigated with their study, demonstrating the preference of the respondents for a natural design element like water instead of artificial ones, in particular for its reflectance. Through a scale model, previously tested and judged to look realistic and similar to a real natural place, they involved sixty adults in evaluating reflection in water versus reflection in glass and to observe reflection versus transparency and to write down their emotional feelings according to what they were looking at. What resulted is the inclination of individuals for water, and so a natural element, rather than glass, an artificial one; more-



over, the reflective scenes rated very highly in the questionnaire. The authors also consider the possibility of an increase in attractiveness in the transparency of the water thanks to the hypothetical presence of live elements such as a coral or fish that, as mentioned in the study conducted by Prajal Pradhan, increases the sense of naturalness. (Nasar & Li, 2004)

The consequences of the installation of a water quality treatment (WQT) system in Mengqing Garden, a public park created out of a previously industrial area on the south bank of Suzhou creek in the city of Shanghai in July 2004, can be considered an application and proof of what has been demonstrated by the study conducted with scale models.

This pilot project was designed to serve as demonstration of how ecological engineering practices can improve water quality in a degraded urban river, but what came out after a few years results interesting for this research about human response to water. As soon as, thanks to this system, the aquatic habitat became more viable and highly diverse species grew, the space became a place for education and recreation. Inhabitants coming from the residential area around started being not only visually attracted by the water but also involved in passive and active recreational activities. They started taking pictures using the environment as backdrop for wedding photographs and visitors who believe in Buddhism often free captive fishes and turtles in these cells demonstrating great appreciation for the presence of living creatures in the water. (Li, Manmana, & Andersonb, 2009)

According to the observations made, it is quite clear that the engineering intervention located in this park of Shanghai not only led to a better quality of the water but also fostered a new way of living nearby it in the public spaces as a consequence of its more natural and cleaner appearance.

These examples demonstrate how the naturalness of water is perceived by our eyes and how it affects human reactions. However, the naturalness of water can be perceived not only by the eyes but also when it meets the other senses, such as hearing.

In the urban environment we are subjected to many unwanted noises that sometimes are not perceived because we are used to them, but when the level is considerably more than the threshold we can stand, they are not only annoying but lethal because of the damages they silently create to our body. The urban scope of sound in which we live is full of noises our ears perceive even if we do not consciously realise it; apparently these sounds are low but comparing the value in dB to sounds coming from our daily life such as a vacuum cleaner we will discover how strong this exposure is.

Medicine has demonstrated the consequences of a long-lasting exposure to sound pollution but what maybe not everyone knows is that water can help, lowering noise pollution and creating small "silent" oases in the frenetic sound-range of the city. Moreover, according to Shelley Batts, Harvard Medical School Senior Research Fellow, sounds like that of water are pleasant to our ears because of their low frequency, they reduce anxiety and provoke the same sensations generated by a session of meditation. (Nichols W. J., Blue Mind, 2015)

There are many studies that prove an improvement in a healthy recovery if the person is somehow in contact with a natural environment, even if only visual through photos or paintings. In 1997, as mentioned by Wallace J. Nichols in his

book, a California researcher in psychoneuroimmunology showed ten cancer patients a nature video that included fifteen minutes of the sounds of ocean waves, waterfalls, and splashing creeks, in order to analyse how their chronic pain was reacting. After the video, in the patients a decrease of a value between twenty and thirty percent in stress hormones was registered demonstrating the incredible benefits of the sound contact with water. (Berk & Bittman, 1997)

In other words, according to what has been proved by these scientists, water has a power that does not involve sitting by it and looking at it, but just listening: its sound, because of its naturalness, has a positive effect on people's mood as much as all the other natural connections established between them and artificial environments.

It brings us to a prenatal condition when, inside the womb, all the sounds we perceive are filtered by the water in which we are immersed. Somehow the sound of the water is the first one we enter into contact with and this makes us, unconsciously, associate it with prenatal security and so feeling safe; so safe that it is often used to lull babies and against insomnia. (Strang, The Meaning of Water, 2004)

Talking about senses and the human response to the sensorial interaction with water it is necessary to mention the touch. Touch is what creates a contact between us and the materiality of water and allows us to understand its state. The magic of water is its ability to metamorphose, to be present in nature in different shapes, each visibly different from the others and the act of touching the water puts us in sharp contact with the naturalness of all these possible shapes. Through our eyes we can see if we are in front of a liquid, if it is solid or ice, with our ears we can perceive the density and the quantity while it flows but it is the touch that makes one really enter into contact with it: we experience an immersion of a part or all our body, we feel its temperature and texture.

### 2.3.3 A matter of cleanliness

As stated above, water is seen as the source of life, order and metaphor of time; this is the reason why droughts, floods and pollution generate a great state of anxiety in people making the element lose its positive effects on the human mind. Because of the deep relationship between the contact with water, whatever it is, and human psychological response, a small excursus about people's reaction to water appearance seems to be required, especially once the value of proximity has been proved.

The association of water with life generates fear and refusal among people who see a clear contact between water and death elements: it starts to be associated with infection and disorder.

Water means life because it is itself "alive", it changes constantly never being similar to the previous moment, it takes the shape of the container, absorbs the characteristics of the context where it is and, above all, it moves. For this reason, when this living matter is static or it stagnates and so people cannot perceive the movement it turns into an "unclean" source in people's minds. (Strang, The Meaning of Water, 2004)

What is more, referring to stagnant water introduces another aesthetic aspect of this element that affects human perception: the clarity. David G. Smith, in New

Zealand, at the beginning of 90s, conducted different studies with other experts that put in relationship clarity, colour, cleanliness of water and restoration nearby it. Even if the research is related to the bathing activity, the results are useful in order to understand people's response and willingness to spend time nearby and in water according to its appearance. Mainly, what the studies pointed out confirmed what already thought without any strong scientific base, that is that water appearance and bathing, and so perhaps recreational activities in general, are closely linked. In particular, the attributes of clarity and colour are strongly correlated. For what concerns clarity it seemed that the people's ranking was more related to the personal perception instead of the actual situation and that the possibility of looking at the bottom was related to safety, another important aspect for choosing whether to bathe or not. (Smith, Croker, & McFarlane, Human perception of water appearance, 1995) They showed also the relevance of the colour, because people seemed to be more attracted and to feel more positive towards green or blue, yellow-hued waters being poorly regarded and green-yellow marginally. Yellow was accepted only when perceived, in any case, as "natural".

The unconscious preference to blue finds proof in science. In fact, as soon as water becomes progressively more turbid the colour changes to yellow and conversely if it is particularly clear and clean it is almost blue. This is because the water particulates involved in clarity reduction are typically blue-light absorbing and only in few cases all over the world, as some New Zealand rivers and lakes, the clarity and the colour blue do not go together. (Smith & Davies-Colley, Perception of Water Clarity and Colour in Terms of Suitability for Recreational Use, 1992)

Moreover, the results of the study mentioned in paragraph 2.3.1, conducted in Shanghai in July 2004 when a water quality treatment (WQT) system in Mengqing Garden, a public park created out of a previously industrial area on the south bank of Suzhou creek in the city, was installed, demonstrate the connection that exists between clarity, as a means to perceive the absence of pollution, and so cleanliness and the choice of people to spend time nearby for recreation. In fact, as soon as, thanks to the application of the system, the water resulted cleaner and the aquatic habitat grew considerably, the space started to be considered by the neighbourhood as a spot for education and recreation. People, aware that the water was clean and so safe, were happy to interact with water and stay beside it.

In other words, in the contact with water that has positive effects on humans particularly from a psychological point of view, its appearance, and so its clarity and the colour are important despite not being the main factors. They are involved as proof of cleanliness and so prove that the water we are interacting with is bearer of life. If water is blue, moving and clear it seems to appear clean and so a right place for restoration.

### 2.3.4 Blue colour and blue spaces

On 7th December 1972 while the Apollo 17 crew was on its way to the final mission to the Moon, from a distance of around 45.000 km away, one of the most famous pictures of the Earth was taken. Dubbed as "Blue Marble", it shows our planet entirely illuminated, confirming the huge presence of water on it. (Smith Y., 2017)

Water covers more than 70 percent of the Earth's surface; despite 95 percent of those waters having yet to be explored, we know that from one million miles away our planet appears like a blue marble, becoming smaller and smaller the further away we go until it resembles a tiny, pale blue dot. So, it seems to be natural the connection between the colour blue and the water element.

In some studies conducted for market research, people were asked by psychologists why they like blue and which qualities they associated to it. In the answers given, words like "credibility," "calming," "clean," "focused," "cleanliness," "openness," "depth," and "wisdom," resulted the most chosen. Neuroscience confirms the power of this colour explaining that the blue's wavelengths, in contact with our brain, release neurotransmitters associated with euphoria, joy and wellness, similar to the effect of dopamine.

What is more, a study mentioned in the journal *Perceptual & Motor Skills*, conducted by researchers from Aichi University in Japan pointed out that a blue partition, while subjects were playing video games, generated a more regular heartbeat reducing fatigued and claustrophobic feelings. It demonstrated the positive effects of blue in comparison with red or yellow in general, and, in particular, in a space. (Angier, 2012)

Since the presence of this colour in nature is not so diffuse among animals, flowers and plants it could be argued that blue has not a lot to do with naturalness but if we follow the idea of the neurosurgeon Amir Vokshoor it seems that blue and its shades mean, for humans, sky and water. He theorized that the reason why people are so attracted by blue is because they unconsciously associate it with the environment where humans have evolved, made of shades of blue sky and water. (Nichols W. J., Blue Mind, 2015)

It is not a coincidence that all the environments related to an eminent presence of water are defined as "Blue spaces". They are defined, in other words, as written by Melissa Haeffner, Douglas Jackson-Smith, Martin Buchert and Jordan Rislely, "hydrographic features that can be waterbodies (e.g., estuaries, ice masses, lakes and ponds, playas, reservoirs, and swamps and marshes) or flowlines that make up a linear surface water drainage network (e.g., canals and ditches, coastlines, streams and rivers)". (Haeffner, Jackson-Smith, Buchert, & Rislely, 2017)

Places like this are considered by psychologists as sources of calm and relaxation as much as the water itself.

The scientific explanation of why this element appears blue to our eyes lays the foundations for understanding why people usually associate this colour to it. Sunlight is composed of many coloured light waves which as soon as they go through water are absorbed by it progressively and so every colour disappears in a different range of time. The first ones are red and yellow, conversely, the blue light is the one that resists longer because of its stronger ability of pene-

tration. This is the main reason why the water of the sea appears blue. Another reason is related to the colour of the sky reflected on the water, making the liquid surface take on many shades of blue.

What is more, as mentioned in the previous paragraph, blue is not only related to water in general but especially to clean water so as to enhance the positive effect it has on the human mind.

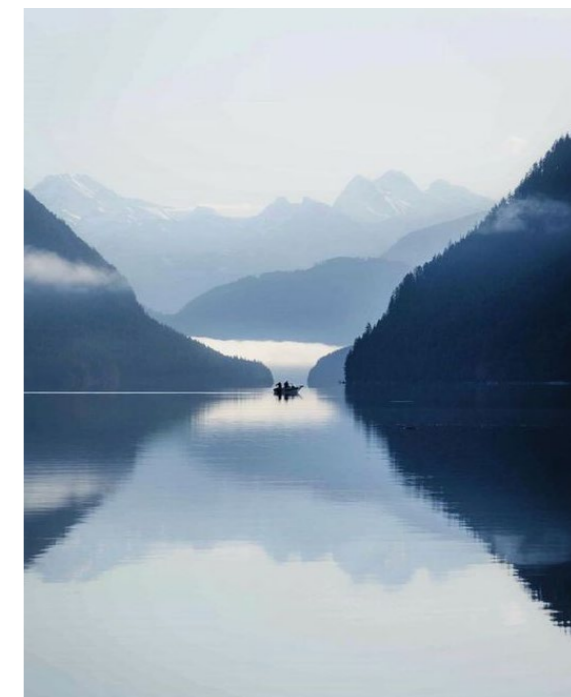
Just like water, blue has its dark side, too. It can be associated with coldness and even death, perhaps because of the blue pallor on our lips and faces when we are lacking energy and oxygen. Pablo Picasso's Blue Period which began in 1901, when he dealt with a deep depression, is a demonstration of how this colour can be related to bad feelings and mood.

However, exposure to blue is needed by humans. In fact, people need to enter into contact with the whole spectrum of light to be found in nature in order to be healthy and to have a regular circadian rhythm. What happens nowadays in the artificial environments where we live is that we are subjected to most incandescent light sources, mostly yellow-orange-red, lacking the blue-green spectrum. Adding blue, in particular blue-light wavelengths, to our lives was found as a solution to it: it readjusts circadian rhythms in night time workers, who are awake till late being less exposed to natural light, and lessens the effects of seasonal affective disorder.

In this sense the use of LED light cannot be considered the means to instantly light up our Blue Mind, we still need water, but it is definitely a way to get nearer to it. (Nichols W. J., Blue Mind, 2015)

In addition, a recently online research confirmed that blue, in particular dark blue, is positive for human beings. The paper manufacturers G. F Smith recently launched an online project, "The World's Favourite Colour Project", involving over 100 countries and 26,000 people in order to understand the most appreciated colour in the world. The idea started from the belief that colour has a strict relationship with our culture and so that one colour instead of another one tells us a lot about our cultural development. The aim of the company was to understand in what colour we are now and to translate it into a coloured paper. The respondents of this research, which soon became the world's largest colour attraction study ever, were asked to associate specific emotions with specific colours and results were organised in "sophisticated algorithms" that generated a colour-coded emotional map. The insights revealed that dark blue was the one generating more contentment and relaxation. (Haslam & Alexander, 2019) (Baines, 2019)

In other words, the exposure to light of the blue colour wavelength has been shown to produce benefits, physically, emotionally and from a cognitive point of view. All the studies conducted here prove a (complex) relation between blue colour, mood and behaviour that can be added to the one previously pointed out that involves clarity, restoration and peoples' choices.



18.

Figure 18. Yangshuo, Peter Leung  
Source: www. stdibs.com

## 2.4 IMMERSION: DISCONNECTION AND RECONNECTION

As mentioned before, touch is the sense that, among all, confirms the materiality of our body and what is around us; it provides us information about our position in the environment. If we touch the water we feel it, we know our position, we perceive the contact and discover the materiality of this element. Touching the water is an experience of *immersion*.

Immersion, according to the Cambridge dictionary corresponds to "the act of putting something or someone completely under the surface of a liquid". (Cambridge University, 2018)

We experience immersion in water from the moment before arriving physically on Earth, in the nine months spent in the womb and so we go on for the rest of our lives: such a strict and immersive physical contact with water is what we experience every day being under the shower or simply dangling our feet in it. Probably this is one of the main reasons why it is widely argued and proved that being immersed in water puts us in a psychologically relaxed state and decreases stress. Not by chance, there are some recreational activities such as swimming and diving, practiced amply by people, that implicate an immersion of the body in the water or under it. In swimming we feel the weight of the matter, we touch it and push it away with our hands, we experience a deep interaction with water that becomes totally extreme when we are underwater: our sensory perceptions are altered. Sight and hearing work differently, the outside world disappears, movements are slowed down and so we are disconnected from the way in which our body relates to the environment every day. (Nichols W. J., Blue Mind, 2015)

Furthermore, our body is made up of fifty percent of water which makes our density close to the one of the medium in which we are and allows us to float. Consequently, what we experience is a state of weightlessness that estranges us from the constant feeling of being a body under gravity. In this sense it generates disconnection.

The marine biologist Wallace J. Nichols agrees with this idea of disconnection looking at water as the opportunity to escape the hyper-connected, over-stimulated state of modern-day life. He strongly believes in the benefits that the access to water can provide us with and in particular the access to our water. In fact, according to his theory, presented in his book "Blue Mind" (2014), we have our own water, an intimate relationship with it. This relationship is personal but also strongly proved by science.

"What's your water? (...) When did you fall completely in love with the way the water makes you feel?" is what he asked in 2015 to the public of the Fountain Hills Community Centre, during a TEDx, to introduce the binomial Red mind, stress, overthinking and Blue mind, the feeling we have when we step into the edge of the water, our water. (Nichols W. J., Blue Mind in the Desert, 2015)

**"Immersion is a kind of escape or disconnection from the world outside the water."**

(Brown, 1997)

**"During immersion, the body sends out a signal to alter the balance of catecholamines in a manner that is similar to the balance found during relaxation or meditation."**

(Nichols W. J., Blue Mind, 2015)

Blue mind is the state that allows you to be far from the stressful modern life. "Blue Mind, a mildly meditative state characterized by calm, peacefulness, unity, and a sense of general happiness and satisfaction with life in the moment. It is inspired by water and elements associated with water, from the colour blue to the words we use to describe the sensations associated with immersion." (Nichols W. J., Blue Mind, 2015) It is a water-human connection reached when in contact with the water that can be kept even when far from it. Conversely, Red mind is connected to the modern-day overstimulation, increased sharply because of the artificial urban environment in which we live, where we are continuously stimulated and where our attention abilities are decreasing.

Apparently, this theory, that relates the natural element with this disconnection, is in sharp contrast with what Veronica Strang says articulating the idea of the water as a recreational element, from her book (2004). Water is recreation, as

already explained, and at the same time, reunification. She refers to the potentiality of being reconnected with the environment through this element and even more generally with nature. Wallace J. Nichols talks about the possibility of obtaining a non connection with the surroundings but his disconnection leads to a deeper connection, the same mentioned by Veronica Strang. Moreover, the way they intend to live this experience is quite similar. She looks at the water as the opportunity of living a moment, first of all, with ourselves, secondly with the others. Similarly, the biologist talks about the water as a moment of pause, solitude and privacy. He suggests going to the edge of the water when you want to be alone, saying

it brings relaxation, nostalgia but also love, for the water itself, ourselves and those around us generating more compassion and empathy: he firmly believes we enjoy our water most if sharing, if we are with the ones we love.

In other words there is an invisible line that connects the recreational power of the water in artificial environments and its ability to reconnect people to themselves, the others and above all to the surroundings: as soon as the disconnection with the hyper-connected urban world takes place, people are immersed and (re)connected to the primary environment where water is one of the main characters.

### 2.4.1 Architectural immersion: amniotic spaces

Anna Barbara, architect, teacher and founder of SenseLab, in her book, "Storie di architettura attraverso i sensi", in 2011 presented her theory according to which the sensation of being immersed takes place in architecture, namely in the amniotic spaces. We can define amniotic as the sensation caused by the immersion in the matter, when you are surrounded by it, above, below, on the sides at the same time and in the same way, similar to the sensation we have in the womb, in the amniotic liquid. So, amniotic spaces are all those constructions where we live this immersion, where we undergo a sensorial distortion.

In order to understand how our sensorial dimension is altered by these spaces it is necessary to start considering the hypogeum architecture: a cavity, the negative space, the one that has been excavated instead of being built, the result of a subtraction instead of an addition; according to her definition, amniotic architectures can be considered as a sensorial extension of this kind of project.

In many other cases, similarly extreme, such as maximum security prisons or the igloo, even if for different reasons, people experience a deep sensorial distortion as in the physical immersion in water: mainly, the (almost) total absence of natural light affects our eyes and a deafening silence influences our sound sense. The sounds coming from outside are confused, deadened and sometimes it is so strong and absolute to make your breath and heartbeat the only things you can hear. Likewise, the time is different from the one outside, it is dictated by the interior.

In this situation the relation between the person and the architecture is so deep to lead to an intimate contact with one's own self. Walking through a total amniotic space means being disconnected from the outside, starting to feel our own presence, being aware of our body: an intimate journey where the dimension is individual and subjective.

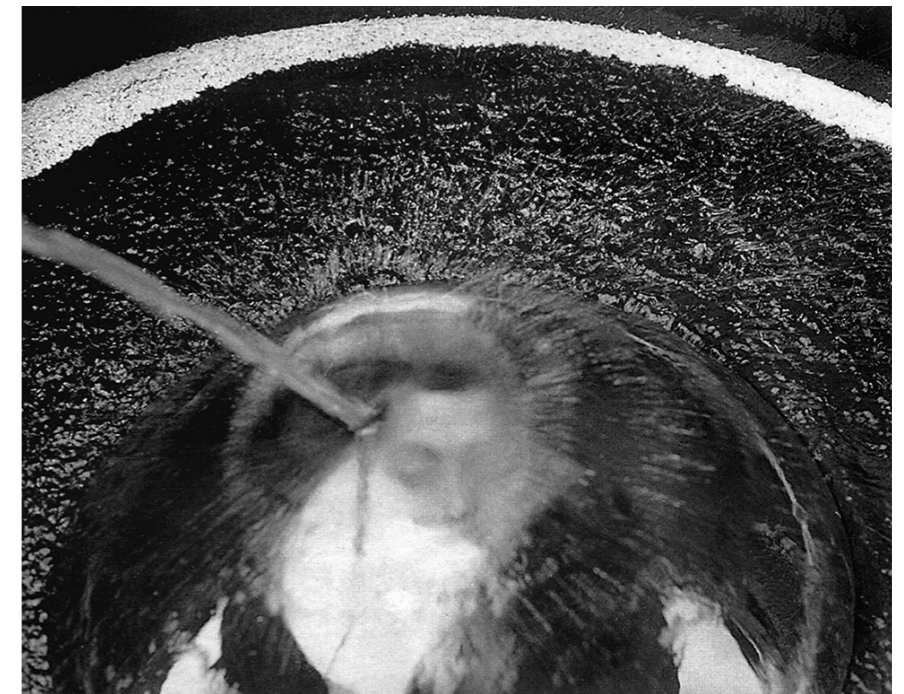
Conversely, the room called Think Tank designed by William Nichols and Richard Stonis inside McDonald's headquarters in Chicago is an example of how the amniotic architecture can be realised in a less extreme way but always strongly effective. This space, namely a think tank, was created for meditation, to be disconnected from the outside offices, to take a rest, find new creative ideas or a solution for a problem. The architecture followed the concept of a womb where one feels estrangement and relaxed thanks to the soft walls. Surely, light and music were playing a central role even if the core of the project was a big heated water bed for enhancing the amniotic sensations totally. (Barbara, 2011)

In other words, what results interesting in this theory of amniotic spaces, more than the extreme experience explained in the first mentioned cases is mostly the way in which amniotic interiors can host people as a womb, disconnect them from the outside in order to reach a solid reconnection, exactly as inside the water, and an intense experience through our senses. Moreover, it is not a coincidence that when an amniotic space for meditation, creation and relaxation is designed, water somehow is inserted, in the centre, in the core.

#### 2.4.2 Bill Viola's immersion: the value of slow time

As told by the artist, when he was a child, he fell into the water and almost drowned; this episode marked all his life turning into a positive trauma, into "the most peaceful moment" of his life, source of inspiration during his entire career as a contemporary video artist. (Viola, 2017) Many are his artworks in which water is a fundamental element, aesthetic and visual, he represents it both in a positive and negative way, as a source of life but also as a means of destruction and death, focusing mainly on the concept of immersion: immersion of the spectator but also of the protagonists of his pieces.

In all the exhibitions about the artist, the public is asked to enter totally dark rooms where the only light and sound come from the screens. There is no



19.

Figure 19. *Immersione nell'acqua*, Ugo La Pietra, 1969  
Source: [www.ugolapietra.com](http://www.ugolapietra.com)

connection with the outside, a total disconnection that leads to a deep focus on the artworks. Beside the physical immersion recorded in the screen, immersive spaces are recreated to live the exhibition: time and reference points are totally annulled.

In the amniotic spaces or rather architectural structures where immersion takes place, as explained in the previous section, the concept of time plays an important role: it is different from the outside and totally, or partially, dictated by the interior.

Bill Viola, as an artist, defines himself as a "sculpture of time", making, in his artworks, the idea of time as crucial as the water element. Since the beginning of his career he started exploring new video-making technologies but it is not only the interest for technological experimentation that drives the artist in many choices, especially the great use of slow-motion. Viola's use of slow motion manipulates time in order to enhance meditation and contemplation among the public that has to be concentrated for a longer duration of time and that can catch a greater level of details. The contemplation of the artwork so, because of this dimension of time, becomes a spiritual experience that brings the public to a meditative state.

Water and time flow, both; the slow-motion is just the means thanks to which Bill Viola can slow down these flows. He puts the viewer in a dimension where the frenetic and rapid time of the city is extended, where the time is totally subjective, determined by our emotions and so by the rhythm of our heartbeat, as in the amniotic spaces. Playing with time as a plastic material, distorting, dilating and making it disordered, he creates a slow dimension, far from the speed of the city, where words such as stay, wait and no rush are fundamental. (Crosali, 2014)

Many are the artworks where water is protagonist but, in *The Dreamers* (2013), the level of physical immersion that the viewers and the characters reach is total. *The Dreamers* are seven portraits of people dressed, one for each screen, laying on a bed made of cobbles, completely surrounded by water. Their eyes are closed and, despite the apnoea, they seem extremely calm and motionless, their only movements are because of the water's flow and the constant play of light and shadow over its surface. Because of it, transparent and slightly moving, they are suspended in an ethereal dimension between dream and reality. Similarly, the viewer feels as if immersed in the water, in a space inside the water, where what he can see are only the screens, as windows to the outside, an outside under the water. What is more, the strong sound, the same you perceive when you are in apnoea, enhances the sensation of being totally immersed.

In other words, Bill Viola tells stories through the water and teaches how to be patient and slow, how to stop in front of it and catch all the details and the shades we do not perceive in our daily life. His interest for water because of his own deep experience of immersion, the use of the element as central for its design, and the fact he associates time with the element of water make him worth mentioning within this research. In particular, the opposition between the fast speed of the city and the slow flow of the inner time, our personal time, the one when water is around, strengthens the theory of the singular dimension in the immersive spaces. It provides a new interesting point of view on immersion, and water more in general, as a mean of disconnection from the frenzy of the city.

## 2.5 CONCLUSIONS

The Background of this research extensively provides proof of the strict relationship that exists between the city of Shanghai and the presence of the water and on how much it has conditioned its development.

The contemporary view of Shanghai's waterfronts as places for enhancing its inhabitants' quality of life and the consequent focus on their renovations, as demonstrated by some cases selected, pointed out the current interest in returning the river, and in general the presence of the water, to the people and simultaneously showed the absence of any spaces where this contact could be not only visual and static. The brief analysis of the geographical position of Shanghai and its water level and quality made clear the reason why today the contact with it is not and cannot be imagined directly on the water. In particular, considering the studies about human addiction to clean water instead of turbid and stagnant, it results evident the importance of its clearness for reaching positive effects on humans.

What is more, all the industrial areas along the water that today are undergoing projects of adaptive re-use show the potentiality of these parts of the city as spaces where water, Shanghai's identity and recreation converge.

As widely presented in the literature review, being on, in, around, or near water can calm our overloaded minds, permeating our senses. Several studies related to different scientific disciplines have shown the positive response of people to the presence of water in artificial environments, the rise in good humour and the healthier state of our body that the sensorial experience generates.

Its restorative power, broadly argued by research, affected by the proximity, naturalness and appearance, constitutes a valid base for the purpose of designing a publicly accessible space that can host recreational activities. The fact that its presence in artificial environments attracts people and makes them willing to stay seemed to correspond to a space where one can stop and stay, can be metaphorically immersed reaching the "Blue mind" state, rather calm, peacefulness and happiness, leaving outside the "Red mind", the stress caused by our hyper-connected cities.

Immersion, intended as the first and the deepest relationship we reach with water, the only one that involves all our senses and so the most powerful in allowing us to reach a state of calm and quiet, similar to the one obtained during meditation, resulted to be an effective way to obtain the "Blue mind" state.

This theory lays the foundations for the hypothesis of building one, or more, total, or partial, interior spaces in order to create a deep connection with the natural element. What is more, Shanghai's weather conditions and its extremely high air pollution values strengthen the idea that an interior could guarantee this experience, always, despite the outside conditions.

What if this immersion becomes spatial? What if the space recreates the experience of the immersion in the water even if we are not surrounded by it?

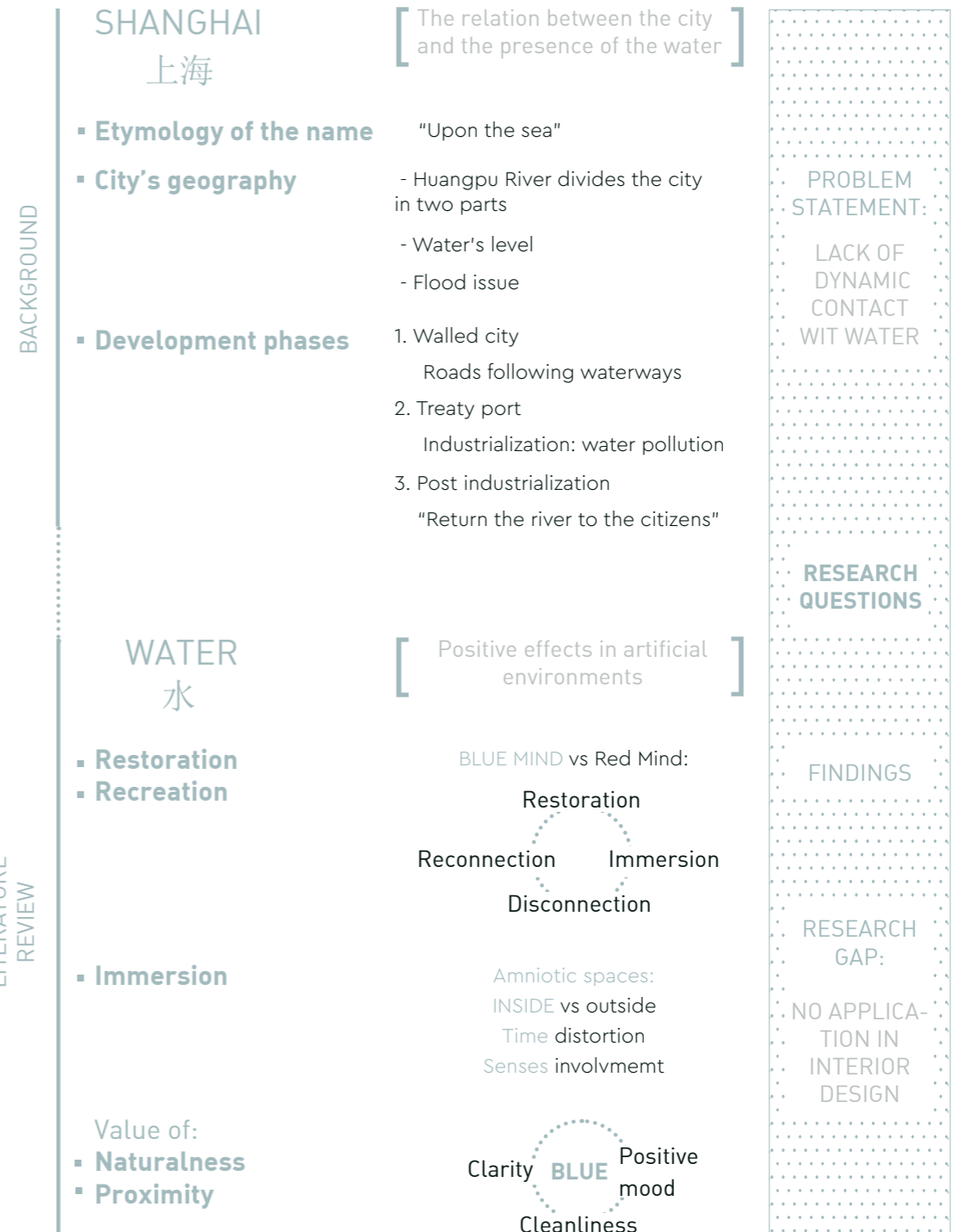
The definition given by the architect Anna Barbara on the amniotic spaces as the ones where we experience sensations similar to the ones in the womb confirms the possibility of introducing the topic of immersion in the world of interior design and provides many suggestions on how the sensations of being surrounded by water can be translated into architecture as much as the theories

about the effects of blue colour. In addition, the work of Bill Viola, the presence of the water in his artworks, the immersion he recreates and his concept of time, extended and slowed down in opposition to the one of the city, introduces the topic of time and confirms what is stated by science and architecture on the value of immersion as disconnection from the fast speed of the urbanity.

What is more, the involvement theory explained by Goffman can help to understand, during the design process, the role of water in the space and involvement in the activities carried on inside.

The invisible line that connects water and recreation with the concepts of disconnection and after reconnection with self, others and the environment explains the dual possible nature of these spaces: for being alone, as a private moment to reach reconnection with our own water, but also with others, in order to share and interact, because of the empathy that the experience of it brings with itself.

The studies carried out until now pointed out a gap in the application of all this knowledge in the field of architecture. All the findings resulting from disciplines different from architecture, above mentioned, such as medicine, psychology, neuroscience, and so on, have not been the core of any interior design projects yet. Thus, the collection of case studies presented in the next chapter provides a key for understanding how to tell a story about water, how to design a tribute to it.



Key points of the research and conclusions  
Source: The Author

## 3 INTERACTION WITH LIVE WATER

This chapter is divided in two parts, the first paragraph is a brief introduction about live water, the theme that guided the following collection of case studies, the second section consists of a group of art installations, architecture, interior and urban design projects divided in three categories, analysed singularly and later compared. Thanks to the selection and the comparison of them it was possible to individuate the aspects that are mostly lacking in the projects already done and consequently, to individuate the possible positions of the intervention meant to be generated by the current research.

### 3.1 THE PARADOX OF WATER

The non constancy of water is related to three main aspects of it: the state, the movement and the appearance; they are not fixed qualities, they change as does the water, rapidly and continuously. The many states of water stand behind its incredible ability to metamorphose into substances with totally different qualities from liquid to solid, including the complete dematerialisation that happens when it evaporates.

The change of state depends on the slight movement among the molecules that compose the element. When water becomes ice because of a decrease in temperature, a change of density happens, water molecules are moving slower and as a consequence they create a number of hydrogen bonds impossible to reach in a normal condition. Under four degrees, the molecules need to step away to keep these connections as much as possible; the result is an imperceptible movement that causes a modification from liquid to solid. Similarly, the evaporation is connected to a change of temperature, an increase, and a movement: the heat breaks the hydrogen bonds generating the disappearing of the molecules into the air. (Grasso, 2013)

Besides this movement, completely invisible for human eyes, another type of movement characterizes the natural element, the one clearly perceptible by the eyes when the water is not static and stagnant. It is, by nature, "on the move", when it flows from a place to another, when it reaches our houses through a tap or simply when the wind touches it generating waves and so sound. This is what



makes the water never constant: its ability of moving molecularly and physically and the uncertainty on how it will be after this movement.

Another aspect that contributes to its continuous changes is the appearance: as for the states, for the appearance too, water moves between opposites, it can be flowing or still, as mentioned before, but also invisible and transparent or reflective and dark. The reason stands in the paradox that water has no intrinsic characteristics but it totally depends on the elements it enters in contact with, both natural and artificial from which it takes the aspect of. It is shapeless, colourless, tasteless, odourless and soundless. Its organic nature makes it possible to adapt to every kind of container and so change its shape and the path of its flow; likewise, the sound it produces is the result of the moment when water touches another material. Similarly, the colour depends on the aspect of the surface on which it lies but also on the elements it enters into contact with. Also, the taste and the odour are obtained by the chemical interaction that takes place between the water's components and the incorporated elements. (Swartz, 2008) In fact, because of its structure water is a solvent that mixes substances when liquid.

***"It never looks the same twice...there's always that uncertainty about how it will be... There's something very therapeutic about watching water – I love sitting and just watching it...the movement is nice isn't it...and the light on the water is lovely..."***

*(Strang, The Meaning of Water, 2004)*

All these aspects enlighten its paradox, its complexity and its power of changing continuously according to the environment where it is placed. It is a live element and so it is changed and simultaneously changes the surroundings making the experience of water always different.

These considerations constitute a further step in the research and the base for a collection of case studies, useful for a deep understanding of how to tell this story about the water in the city, what already has been done in the design field and how.

In particular, the following chapter is the result of a selection of a small-medium scale architecture and art projects, such as interior design, urban interior design, rather small scale interventions located in the urban environment, and art installations all related to the concept of live water. They represent possible solutions to how to add value to the presence of the water in the urban context creating a relationship between it and the built-up environment; all these projects lead to an immersion in water, not a physical one, not related to the fact of being wet but mostly to the fact of being surrounded by it and experience an uncommon interaction.

All the selected projects are divided in three categories in order to conduct a deep analysis of three different aspects of the relationship between water and architecture:

1. The urban environment and the pre-existing water
2. The influence of water on a pre-existing architecture
3. The immersive spaces where to experience an immersion in water without touching it.

The analysis of each case, through the study of the concept, the reasons behind the shape of the architecture and the use of materials, included the individuation of some main and secondary architectural elements that characterize each project. What is more, each case has been evaluated according to a radial graph, created by the Author, as showed in the following pages, where the five variables came both from the findings of the literature review and a preliminary analysis of the single projects selected. It resulted important to understand how much each one is connected with the context (*genius locis*), related to what makes singular and special the place where it is located and simultaneously the connection with the environment changes, such as weather conditions, that occur in the surrounding. Conversely, the reproducibility, potentially in sharp contrast with the *genius loci*, aimed to understand, in terms of design, how much the space or the object could be designed for a situation with similar characteristics. The last two variables of the graph are the ones more related to the water, the interaction investigates the level of contact between users and water and the new experience of it wants to study how much the project could change the way in which the user look at the element usually. The aim in using this tool was to evaluate each project according to these five key points and, later, have the possibility to compare all the results so as to understand the position of the author's design among the already completed projects.

Each group is presented by a brief introduction that explains which are the common points among the different projects, follows an overview and a card, one for each case, that provides basic information about each project and enlightens the key aspect of it from architectural and conceptual points of view. In each category the cases are listed in a chronological way, from the oldest to the most recent one.

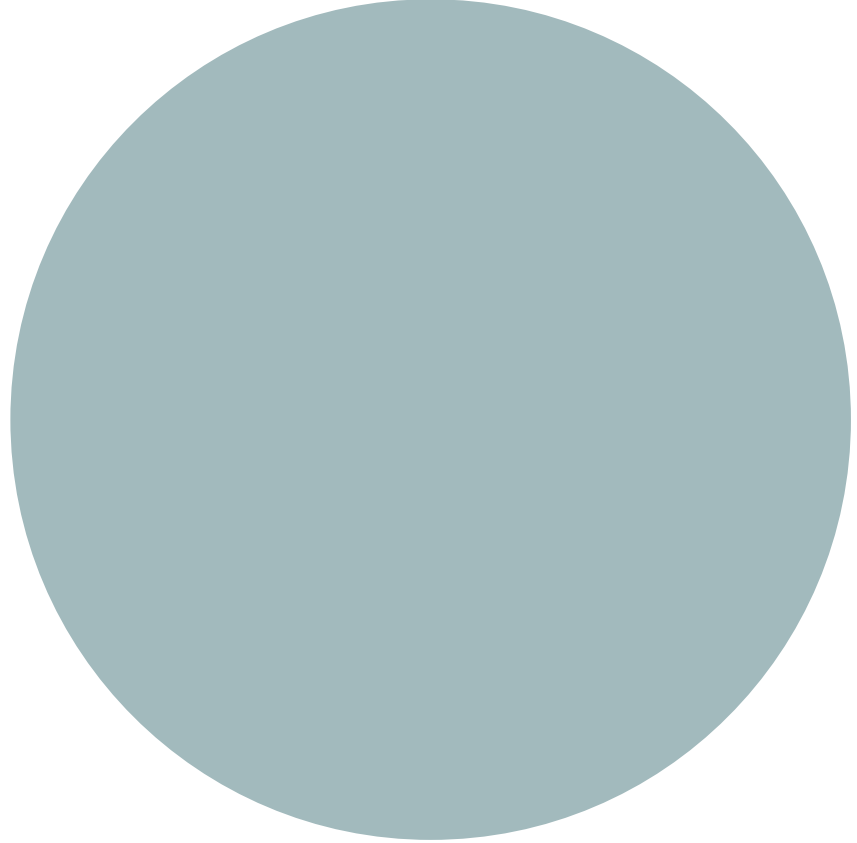
Radial chart to evaluate the case studies  
Source: The Author

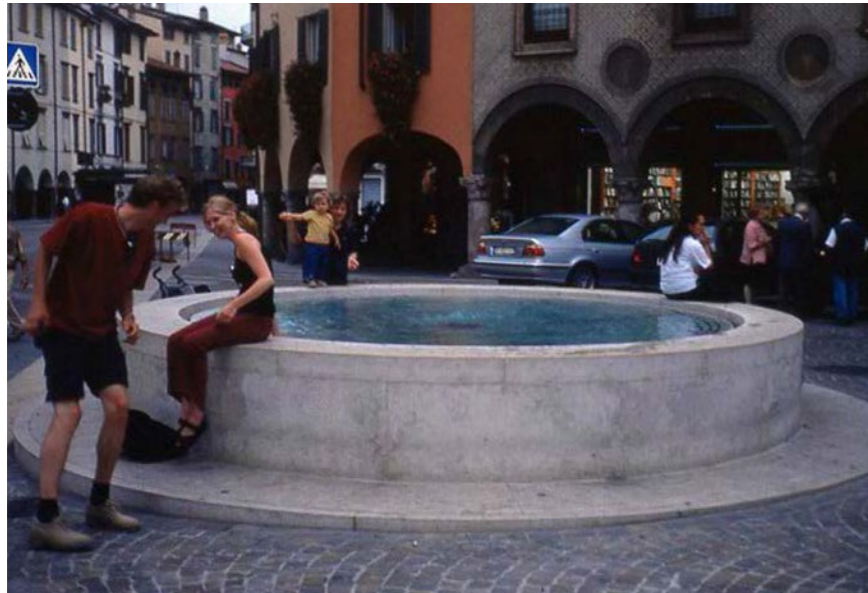
## 3.2 NEW POINTS OF VIEW ON URBAN WATER

The first group of case studies includes mainly interior projects, installations and urban interior interventions designed with the aim of reconnecting people to the pre-existing presence of the water in the city, to make the inhabitants more aware by changing their interaction with it and their point of view. The places designed around the water are spaces to stop, mainly to relax and gather, far from the speed of the city although their position in the urban reality.

***"The most constant 'quality' of water is that is not constant, but is characterised by transmutability and sensitivity to changes in the environment. It has an extraordinary ability to metamorphose rapidly into substances with oppositional qualities (...). Each of these states has its own qualities and is imbued with its own meanings, and all are always there in potential."***

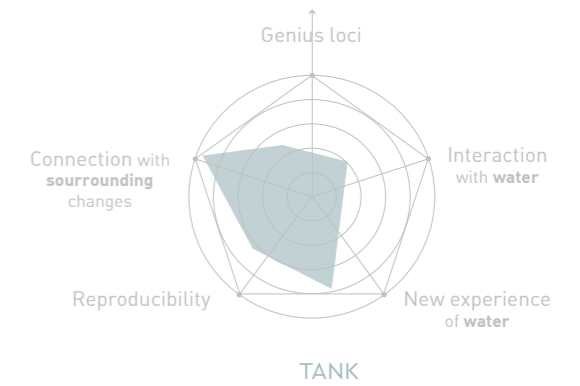
*(Strang, The Meaning of Water, 2004)*

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01. FONTANA DELL'ACQUA CALDA, Alberto Garutti
  02. THE SEA ORGAN, Nikola Basic
  03. THE WATER TEMPLE, K. Donnellan, MEDS students
  04. VIEWPOINT, AOR
  05. SONIC MAPPING, Bill Fontana
  06. FLOATING WORLD, Ray Bartkus
  07. LISBON FALLS, Marcelo Dantas
  08. TIDE FIELD, Stacy Levy



## FONTANA DELL'ACQUA CALDA

ALBERTO GARUTTI



***The space embraces citizens, it becomes  
a gathering place (...)  
The touch experience is added to the  
visive one.***

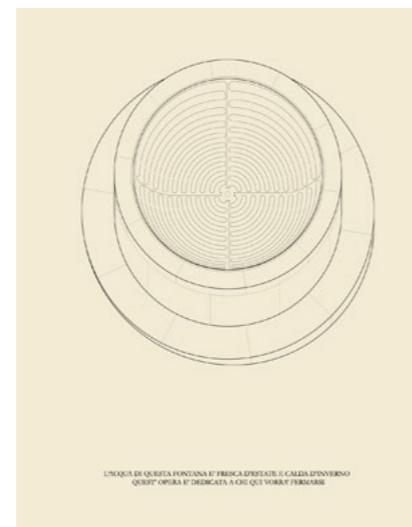
*Alberto Garutti*

The artwork has the shape and the function of a common public fountain, but what makes it special and different is the fact that the water that comes out reaches different temperatures according to the seasons. Thanks to a thermoregulation system, the water and the stones the fountain is made of change their temperature becoming hot in winter and cold in summer. The change is perceived only by the

touch: the involvement of this sense is added to the common visual experience that people have of a public water feature. The fountain, thanks to the water, follows the cycle of the seasons and guarantees a comfortable space, despite the weather conditions, for gathering in public spaces. (Alberto Garutti)

20.

LOCATION: Bergamo, Italy  
PROJECT TYPE: Public fountain  
FUNCTIONS: Gathering place  
YEAR: 1997



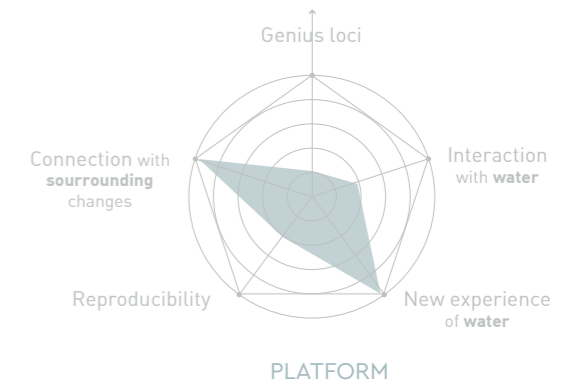
21.

Figure 20, 21. Fontana dell'acqua calda, Alberto Garutti  
Source: [www.albertogarutti.it](http://www.albertogarutti.it)

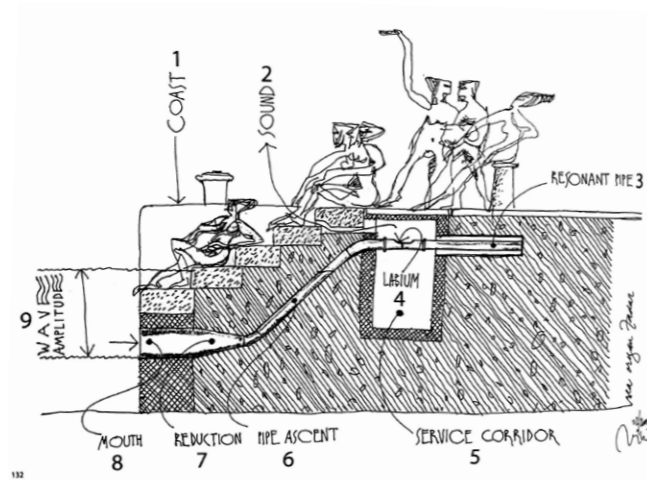


# SEA ORGAN / GREETING TO THE SUN

NIKOLA BAŠIĆ



22.



LOCATION: Zadar, Croatia  
 PROJECT TYPE: Waterfront renovation  
 FUNCTIONS: Public gathering  
 YEAR: 2005

23.

The Sea organ and Greeting to the Sun are parts of a bigger project born with the objective of reshaping the waterfront of the Zadar port city making it more enjoyable and a place for restoration.

The Sea organ is designed as a stairway so as to induce people to stop, sit and stay along the waterfront enjoying the presence of the water in the city. It looks like a simple marble staircase touched by the sea but, as soon as citizens stop by, they discover it is a sea organ: thanks to underneath polyethylene tubes of various sizes, the air pushed and accelerated by the waves flows into the tubes generating a musical sound. The openings on the steps allow people to hear the sound, always different according to the energy of the waves and the infinite ways in which they touch the shore.

Similarly, the Greeting to the Sun, a circular glazed surface of 22 meter of diameter on the floor is activated by the presence of the water. Thanks to photovoltaic cells that transform the solar light into energy it works as a lighting system; some cables connect this panel with the cavities from which the sound of the water goes out, making the lighting feature a means to convert the energy of water into light sensations.

This project is inserted in the category "new points of view on urban water" because it is about bringing the city's waterfront back to life, designing near the water, creating restorative places taking advantage of its presence, reconnecting the city's inhabitants to it through a new, not only visual, experience. It represents the collaboration between a controlled architectural structure and the unpredictable nature. (Uffelen, 2010) (Broto, 2007)

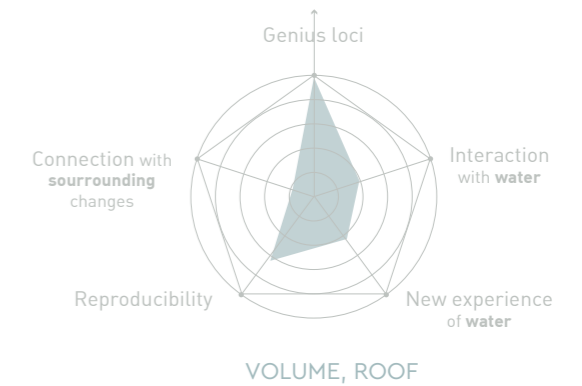
Figure 22, 23. Sea organ and Greeting to the sun, Nikola Bašić  
 Source: Landscape design: promenades by Krauel J., 2007, Links International



24.

## WATER TEMPLE

KIERAN DONNELLAN AND  
MEDS STUDENTS



LOCATION: Ljubljana, Slovene  
PROJECT TYPE: Public furniture  
FUNCTIONS: Exhibition pavillon  
YEAR: 2012



25.

The Water Temple is a temporary exhibition space located in a narrow riverside park, a wooden pavilion where the triangular steps lead to a sliding wooden door which lets the visitor enter a single cell space entirely occupied by a tiny pool of shallow water and logs which form stepping stones. The concept was inspired by the history of the Ljubljana river, and in particular, the ways that local people interacted with it when it was necessary to move, daily, around the city using small boats along the river. The act of stepping onto sliced tree-trunks placed on water evokes this way of moving around in the past and the timber elliptical shape of the structure recalls the means of transportation,

the boats. The ellipse also represents an experiment to test the amplification of sound: this geometry has two focal points and any sound that occurs in the interior will be loudest at those points. One of the two points is occupied by the door so as to make the sound of opening and closing it impressive for a such small space. (Chalcraft, 2012)

The concept that stands behind this project shows, on the one hand, the strength of a space with minimum dimensions completely filled with water, and on the other, the possibility of re-evoking the past of a city developed on the riverfront, making people experiencing it metaphorically.

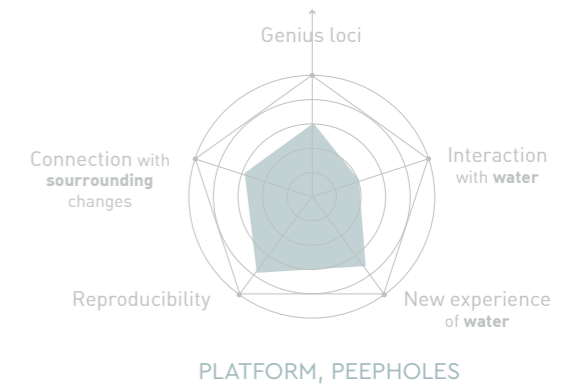
Figure 24, 25. Water temple, Kieran Donnellan and MEDS students  
Source: [www.dezeen.com](http://www.dezeen.com)



26.

## VIEWPOINT

AOR



***"Basically it's a floating platform where people can go and have a view along the river, and just have a small break from the hectic life of the city of London"***

*Erkko Aarti*

LOCATION: Regent's Canal, London, UK  
 PROJECT TYPE: Public furniture  
 FUNCTIONS: Floating platform  
 YEAR: 2012-2014



27.

Viewpoint is a viewing and learning platform built on London's Regent Canal with the aim of reconnecting people, nature and the architecture of the city.

The triangular shapes, inspired by the Finnish Laavus, shelters used for fishing and hunting, have been designed to provide adults and children with a floating space on London's canal where they can increase their contact with it by being totally surrounded. Also the choice of the materials is a compromise between the environment and architectural necessities: the corten steel used for the exterior

shelter creates a connection between these structures and the boats on the river, the timber used for the interior softens the acoustics and the concrete ground surface, imprinted with mock animal tracks, was designed to prevent slips. Triangular peepholes at the eye levels of both children and adults offer private glimpses of the natural environment around, strengthen the idea that it is a place where one can stop and stay far away from the stress of the city; it is a place near the water and it can also become a place to discover and learn. (Frearson, 2014) (Baker, 2014)

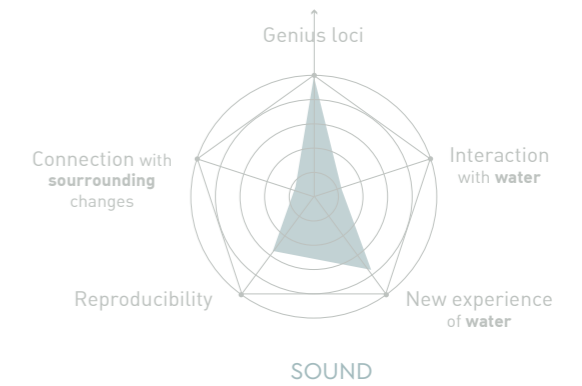
Figure 26, 27. Viewpoint, AOR  
 Source: [www.dezeen.com](http://www.dezeen.com)



28.

## SONIC MAPPING

BILL FONTANA



***"Sonic Mapping connects the audience to the acoustic sorrow of Rome generated by the sound of the water that flows through the ancient aqueduct of the city"***

*Bill Fontana*

Sonic mapping is an immersive sound sculpture born with the aim of creating a relationship between the architecture of MAXXI by Zaha Hadid and the city of Rome, where it is located. The hidden sound of the roman aqueduct of Acqua Vergine, which supplies some of the most beautiful fountains of the city has been mapped by the artist; the multiple sounds of the water flowing through the underground channels come back to life, recon-

necting people to the hidden part of their environment.

The fact that the record is placed in a public space not directly connected to the water gives people the possibility of feeling disconnected from the environment where they are, where time and space are both the one they see around them and the one dictated by the sound of water. (Sonic Mappings by Bill Fontana, 2014)

LOCATION: MAXXI, Rome, Italy  
 PROJECT TYPE: Permanent sound installations  
 FUNCTIONS: Reconnection with the city  
 YEAR: 2014, exhibition "Museo Aperto Città Aperta"



29.

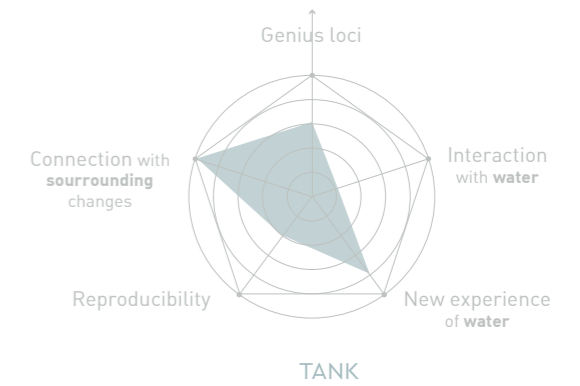
Figure 28, 29. Sonic mapping, Bill Fontana  
 Source: The Author



30.

## FLOATING WORLD

RAY BARTKUS



***"I came out with the idea of using the river as a participator of the artwork while I was looking for the right place where to draw it. The old mill along the slow flow of the river inspired me immediately"***

*Ray Bartkus*

LOCATION: Marijampole, Šešupe river, Lithuania  
 PROJECT TYPE: Mural  
 FUNCTIONS: /  
 YEAR: 2015



31.

At first glance the mural appears nothing more than a drawing, without any meaning, on a façade nearby a lake. But when the weather conditions are favourable and the image is reflected on the water the real meaning of it is revealed: looking at the reflection you can see swimmers, rowers, boats, and swans that interact with the water. The artist intentionally painted the mural upside down in or-

der to enhance the presence of the water nearby the building. As a consequence, the artwork and the façade are changing every time in relation with the environment and so the environment itself: the reflection of water is used as material, as a source to surprise people that find themselves in front of an ever-changing artwork. (Bartkus, 2015)

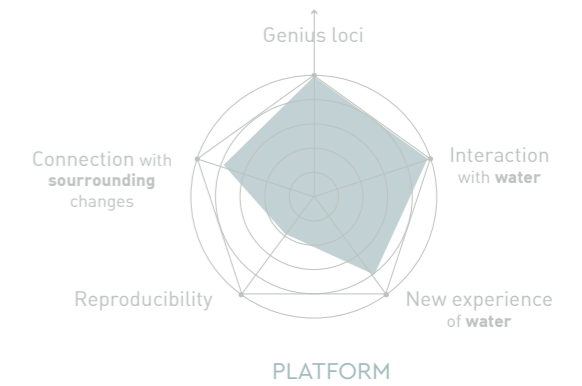
Figure 30, 31. Floating world, Ray Bartkus  
 Source: [www.raybartkus.com/street\\_art.html](http://www.raybartkus.com/street_art.html)





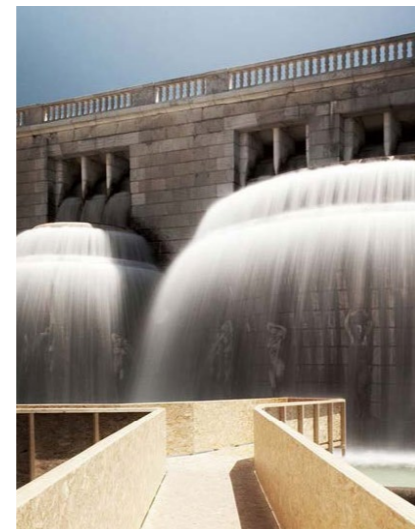
# LISBON FALLS

MARCELO DANTAS



32.

LOCATION: Lisbon, Portugal  
 PROJECT TYPE: Installation  
 FUNCTIONS: Catwalk  
 YEAR: 2015



33.

The temporary structure is a pathway that allows visitors to get a full experience of light, sound and water entering into Fonte Luminosa fountain in the city of Lisbon. Thanks to the ascendant platform and the high walls that gradually decrease, simultaneously protecting from falling and allowing one to experience the water feature directly, people can perceive different sounds, humidity levels and water temperatures. Two different optional directions to walk almost underneath the cascade are provided to the citizens who have

always looked at it from above. (Griffiths, 2015)

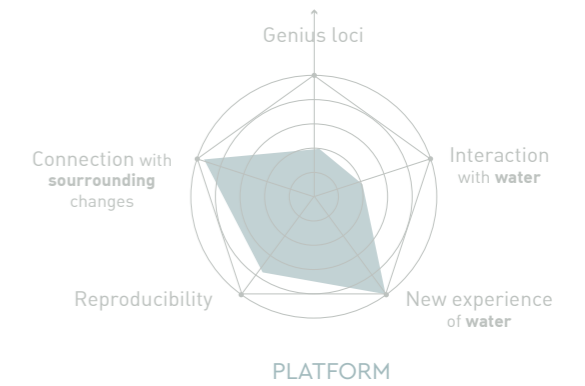
Despite its temporariness, this project shows how the experience of a place in the city, well known by its citizens, that people are used to looking at, can be changed, how a static experience of it can become dynamic and surprising. Of course, the presence of the water makes the way of living it continually different thanks to all the variables that characterize its liquid state.

Figure 32, 33. Lisbon falls, Marcelo Dantas  
 Source:www.bmiaa.com



# TIDE FIELD / RIVER ROOMS

STACY LEVY



34.



LOCATION: Philadelphia's Bartram's Garden, US  
 PROJECT TYPE: Installation  
 FUNCTIONS: Observation on changing tide  
 YEAR: 2018

35.

It is a tide-responsive floating installation that aims to draw the attention of citizens to the changing shores of Philadelphia's Bartram's Garden. The Schuylkill River changes tide twice daily; in order to register this modification and make it noticeable the artist Stacy Levy has put hundreds of rounded, brightly painted buoys in the water. When the tide is high, only a few buoys are visible but as soon as the tide goes out, more buoys are exposed. This is easily visible from

the River Rooms, another installation made by the same artist that consists of a series of boat-shaped viewing platforms on the riverfront. The result of the combination between these two projects is a space for gathering and observation, it is a way to be more aware about the environment where we live raising the attention to a typical phenomenon of all the cities built nearby water, often not considered. (Levy, Tides, 2018)

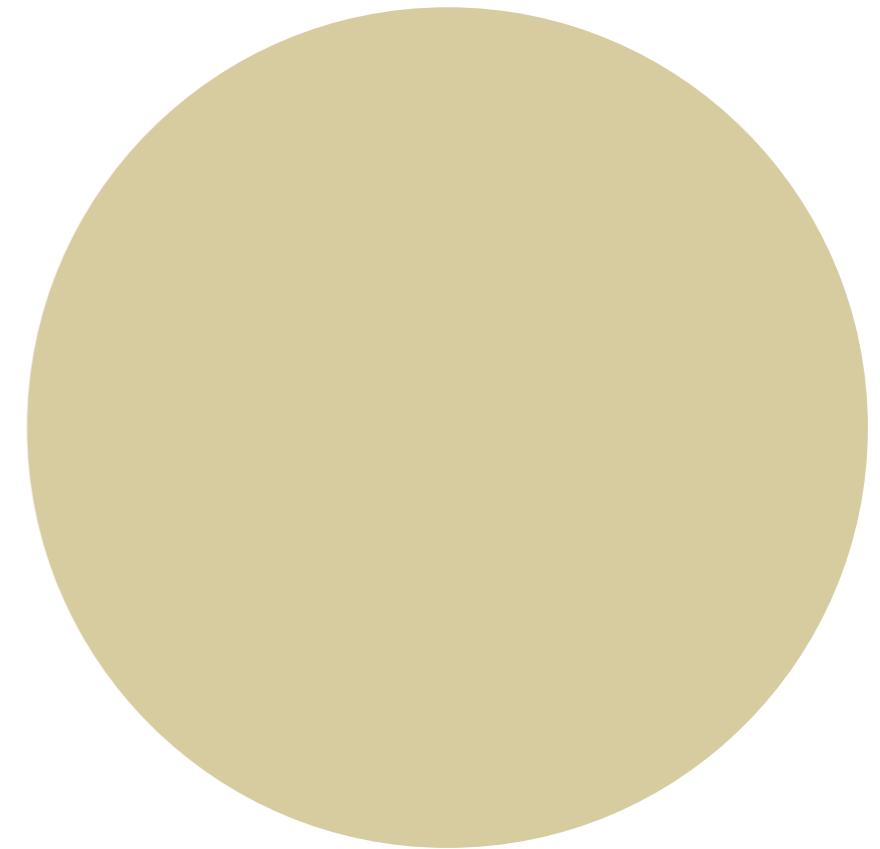
Figure 34, 35. Tide field/ River rooms, Stacy Levy  
 Source: [www.stacylevy.com/tide-field](http://www.stacylevy.com/tide-field)

### 3.3 LIVE ARCHITECTURE

In the section "live architecture" the attention is focused on the relation that exists every time water enters into contact with architecture, naturally or because inserted in it by humans. As already explained, water is alive, always changing and consequently the built environment becomes alive: water obtains a colour, a sound, a shape and simultaneously the architecture is modified temporarily or permanently by it.

***"So the building tells us something about the water passing over the roof and the water tells us about the building; and in this way both water and water covered surface shape each other by telling us about the other and about themselves".***

*(Le Corbusier)*



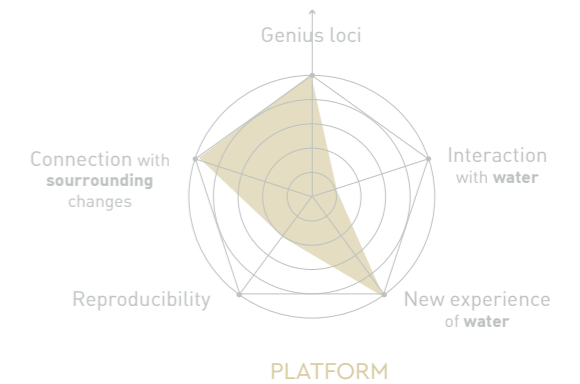
- 01. FONDAZIONE QUERINI STAMPALIA, Carlo Scarpa
- 02. RICOLA, Herzog&De Meuron
- 03. WATER MAP, Stacy Levy
- 04. TESHIMA ART MUSEUM, R. Nishizawa & R.Naito
- 05. CONCERTO DI GOCCE D'ACQUA, M.de Lucchi & L.Palmieri
- 06. MATTER TO MATTER, Arthur Analts



36.

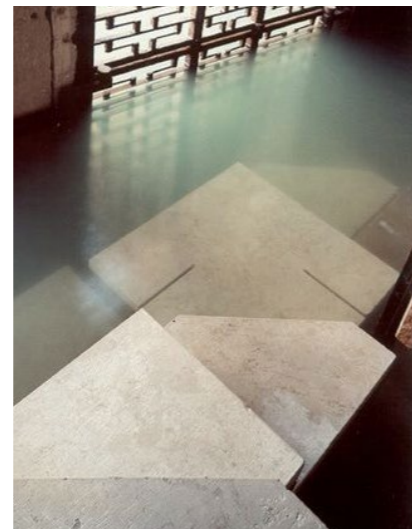
## FONDAZIONE QUERINI STAMPALIA

CARLO SCARPA



***"Inside, high water will be inside, as it is in the rest of the city. It is just about holding it, controlling it, using it as a bright and reflective material."***

*Carlo Scarpa*



37.

LOCATION: Venice, Italy  
PROJECT TYPE: Interior architecture  
FUNCTIONS: Museum  
YEAR: 1959

The architect Carlo Scarpa was commissioned to renovate the ground floor and the back garden of Fondazione Querini Stampalia in Venice, Italy. His intervention was based on a balanced combination of old and new elements realised by a deep study of details and materials.

Key points of this project are the high tide and the genius loci. In fact, the city of Venice is famous all over the world for its high tide that changes the aspect of the city and the way of living it completely. The project of Carlo Scarpa aims to involve this double soul of the city inside architec-

ture, making the water enter, hosting it without considering it an obstacle, so water becomes one of the main characters, one of the main materials. When the channel, which the Palace overlooks, is subjected to the high tide, water enters through the opening of the door and received by the stone steps designed to match the natural element, perfectly. The water, thanks to secondary channels, enters also the rooms inside, the reflections on the walls and the ceiling making it a constant presence. (Contemporary, Architecture, Carlo Scarpa, s.d.) (Beltramini & Zannier, 2007)

Figure 36, 37

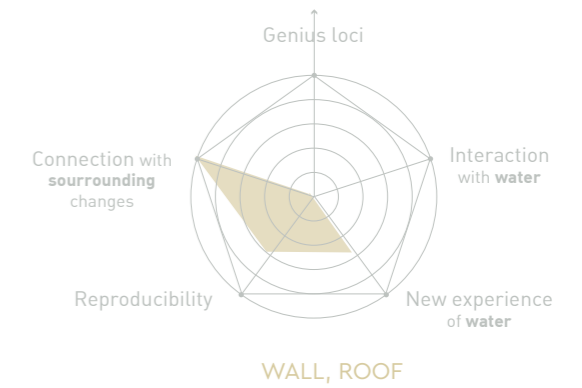
Source: [www.metalocus.es/en/news/architecture-details-palazzo-querini-stampalia-carlo-scarpa](http://www.metalocus.es/en/news/architecture-details-palazzo-querini-stampalia-carlo-scarpa)



38.

## RICOLA

HERZOG&amp;DE MEURON



39.

LOCATION: Mulhouse-Brunstatt, France  
 PROJECT TYPE: Architecture  
 FUNCTIONS: Production and storage building  
 YEAR: Project 1992, realisation 1993

Many are the aspects of this project that have been studied in detail by the Herzog & De Meuron, especially for the interiors. However, the position of this case study in the category "living architecture" is related to the design of the building's facade: weather conditions and time change it generating a changing facade over time. Once the rainwater fills the roof totally, a system has been designed in order to make it flow along the exterior walls leaving traces. (Olivari & Venturini, 2016)  
 Water, rainwater, and architecture are the protagonists of this idea, time and

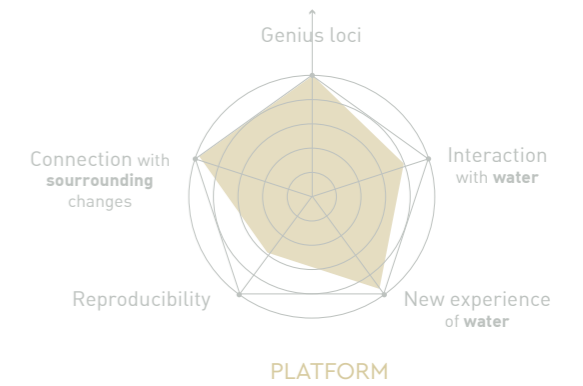
memory of the passage the keywords. Many are the projects in architecture based on this controlled and simultaneously random modification of the building not only for the exterior walls but also for the interiors. One among all, impossible not to mention the "Vals Thermal Bath" by Peter Zumthor, opened in Vals, Switzerland in 1996. In this project one corridor in particular has been designed choosing a material that could react with the flowing water leaving a clearly visible and colourful sign of its passage.

Figure 38, 39. Ricola, Herzog&De Meuron  
 Source: [www.herzogdemeuron.com](http://www.herzogdemeuron.com)

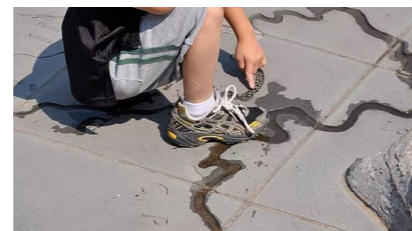


# WATER MAP

STACY LEVY



40.



LOCATION: Friend's Central School, Wynnewood, USA  
 PROJECT TYPE: Sculpture / public furniture  
 FUNCTIONS: Outdoor classroom, gathering space  
 YEAR: 2003

41.

The Water Map is a sculpture on the floor of a common space of the Friends' Central School: the bluestone is engraved following the line of the Delaware River that surrounds the school. The sculpture changes according to the weather conditions and water is protagonist becoming part of it: when it rains, the map carries water through the carved tunnels thanks to a slight inclination. The river, the tributaries and the historic stream, which once flowed in the region, now underground, are sandblasted in the bluestone; they become alive when it rains, increasing people's awareness about the geography of the area in the present and in

the past. What is more, the discovery of the river is enhanced by the reproduction, engraved on the benches, of the microorganisms found in the water of the stream, making the miniaturized macroscopic area coexist with the zoomed microscopic life. Water, uncontrolled and random such as that of the rain, is the means by which people can feel reconnected to the river of their city, they can learn and be surprised in a place of gathering and education. Rainwater makes the public space alive, it is designed carefully to host the random water and be transformed by it. (Levy, Rain, 2003)

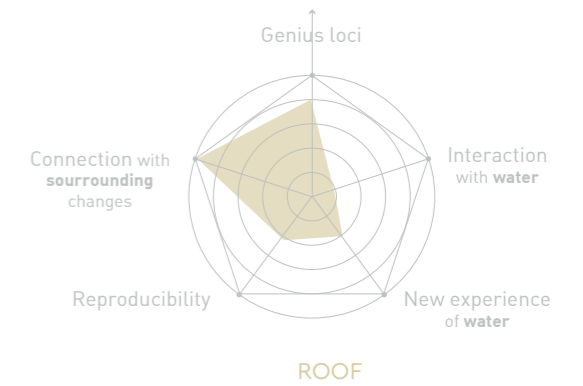
Figure 40, 41. Water map, Stacy Levy.  
 Source: [www.stacylevy.com/water-map](http://www.stacylevy.com/water-map)



42.

# TESHIMA ART MUSEUM

RYUE NISHIZAWA & REI NAITO



43.

LOCATION: Teshima, Japan  
 PROJECT TYPE: Architecture  
 FUNCTIONS: Museum  
 YEAR: 2010

The entire building has been designed thinking about water, the shape is meant to look like a droplet of water; the architecture is fluid without any structural interruptions and the use of concrete aims to imitate the organic nature of the water. The architecture is a connection between built environment and nature which makes this project interesting for this research, particularly the decision of creating two oval openings on the roof that let wind, rain and light

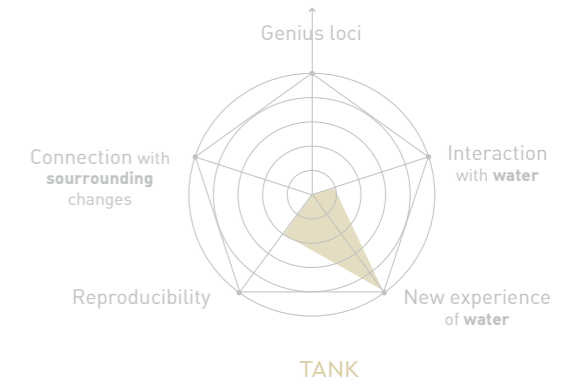
enter thereby creating an "open living interior". In particular, once rain-water trickles from the ceiling it creates pools on the floor, because of the nature of the concrete, and once these little pools are big enough, they slide and disappear down little holes, re-emerging a little later elsewhere along the floor. Living nature and water make the museum continually different, despite its emptiness. (Teshima Art Museum / Ryue Nishizawa, 2011)

Figure 42, 43. Teshima art museum, Ryue nishizawa & Rei Naito  
 Source: www.archdaily.com



# CONCERTO DI GOCCE D'ACQUA

MICHELE DE LUCCHI  
LORENZO PALMIERI

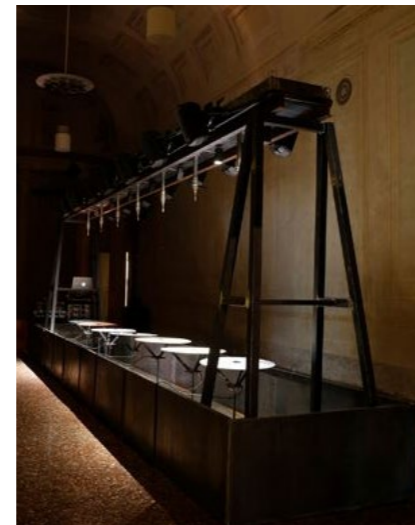


**"A concert of water is a concert of matter"**

*Michele de Lucchi*

44.

LOCATION: Bologna, Italy  
PROJECT TYPE: Installation  
FUNCTIONS: -  
YEAR: Water Design 2012, Bologna



45.

This project is a temporary installation that aims to make people reflect on water and its invisible potentialities: it consists in water drops splashing from different distances on different surfaces. The relation designed between the different materials and the water dropping opens a reflection on the

relation between the artificial matter and the natural one: materials become alive when water enters into contact with them, a sound is generated, one for each surface and the sound reveals both the nature of the material and of the water. (Palmeri, 2012)

Figure 44, 45. Concerto di gocce d'acqua, Michele de Lucchi, Lorenzo Palmieri  
Source: [www.lorenzopalmeristudio.it](http://www.lorenzopalmeristudio.it)





46.

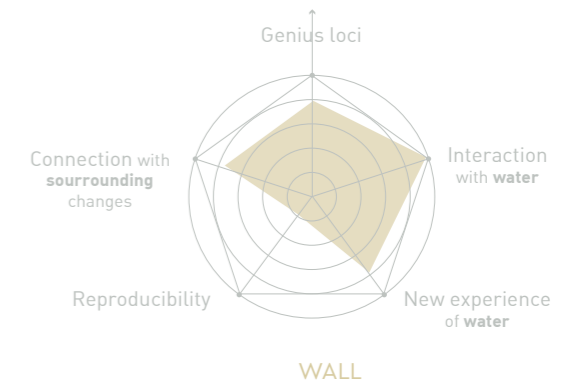
LOCATION: Venice, Italy  
 PROJECT TYPE: Interior architecture  
 FUNCTIONS: Museum  
 YEAR: 1959



47.

## MATTER TO MATTER

ARTHUR ANALTS



***“With the rapid development of modern technologies and cities, it is important to be aware of our interaction with and impact on the natural environment”***

Arthur Analts

The aim of this installation is to reflect on the relation between humans and the natural world, making people aware about our interaction and impact on it starting from an action that belongs to our daily life: drawing with our fingers on glass when condensed. Made by two key architectural elements, a wall and a bench, it was meant to be inside an interior room. The installation is both interactive and contemplative, according to how the user decides to experience it: he can decide to play drawing with the condensation generated artificially on the installed wall, thanks to a technology related to a refrigerator, or simply look at it from the bench in front of it. It is an installation for everyone that makes people go back to their childhood. It is all about discovering the water, in glaze shape, touching and playing

with it, involving all the senses, playing together but also alone, and then, leaving the space letting the architecture keep the memory of our passage: the condensation makes the drawing done previously appear again. It is a living wall that changes according to people's behaviour and the environment outside, because of the climate conditions that modify the room, temperature and the glaze in it.

The project represents the country of the artist, Latvia, its genius loci, the forest water, the sound, the smell, and the wood of which the bench is made, are brought directly into the room transforming it into an immersive experience, involving all senses. (Analts, 2018) (Arthur Analts' Matter to Matter installation represents Latvia at London Design Biennale, 2018)

Figure 46, 47. Matter to matter, Arthur Analts  
 Source: [www.urdesignmag.com](http://www.urdesignmag.com)

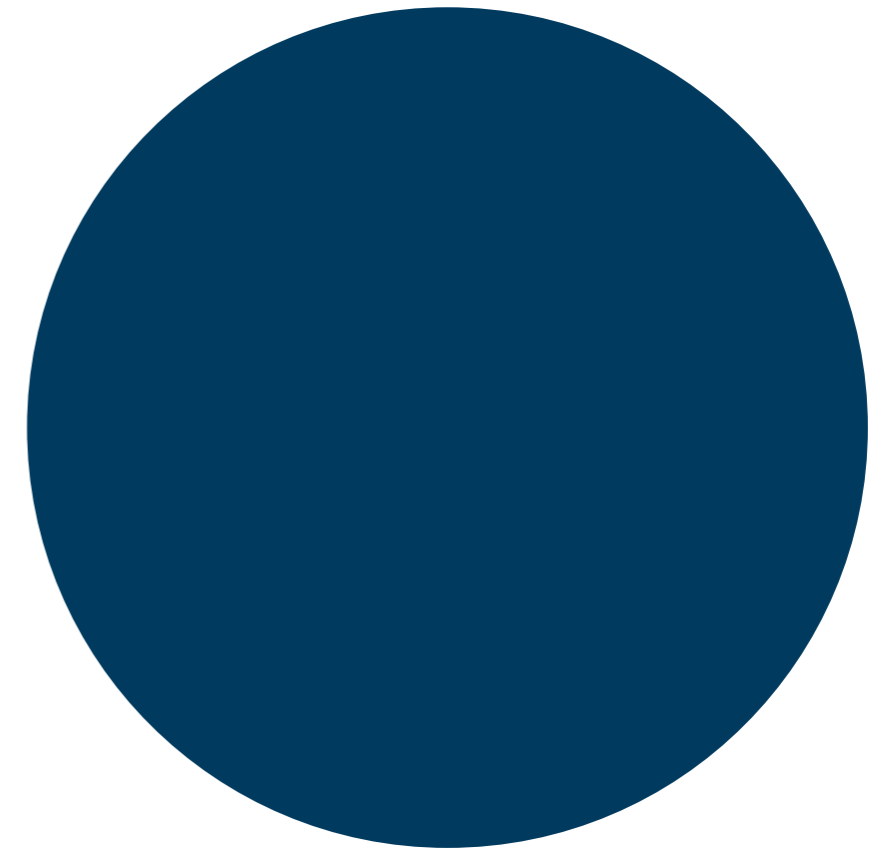
## 3.4 UNDERWATER

The last category is a group of cases, mainly artworks, in which humans experience water. In comparison with the other projects, in this selection, more senses are involved and the immersion in water happens in a more physical than metaphorical way: each artwork gives to the viewer the possibility of being underwater.

Among these cases the focus is the involvement of senses in a pseudo real immersion where water is not necessarily present, how the space contributes to this feeling, how this sensation can be recreated in a small, interior space, almost empty.

***"So I just went right to the bottom like a stone, I opened my eyes, I saw the most beautiful world I ever seen: shelves of light coming down, gorgeous, plants moving on the bottom, in a beautiful way, everything was blue and green"***

*(Bill Viola)*

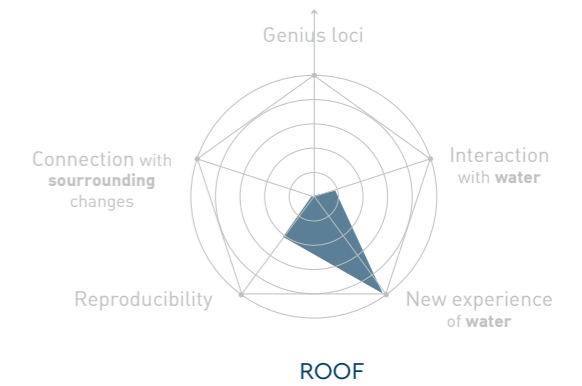


01. SWIMMING POOL, Leandro Erlich
02. TRIANGULAR WATER PAVILLON, Jeppe Hein
03. RAIN ROOM, Random International
04. THE DREAMERS, Bill Viola



## SWIMMING POOL

LEANDRO ERLICH



48.



49.

LOCATION: New York's MoMAPS1, USA  
PROJECT TYPE: Museum installation  
FUNCTIONS: /  
YEAR: First exhibition 1999

This temporary installation, reproduced many times all over the world, was born with the idea of surprising people making them experiencing a space, like a pool, they have known since they were children, and a sensation, the one of being immersed, in a different way from the usual one. The users have two options: they can decide to be on the water, physically on the surface that covers the pool, or under it, in the pool. Two are the aspects that surprise and make this ex-

perience unique, considerably different from the daily one: the possibility of walking on the pool surface and the sensation of being immersed despite the absence of water. They are immersed in the matter instead of the natural element, the light blue colour, the surface made of glass and only 10 cm of water and the light passing through it evokes exactly what people see underwater looking up. (Erlich, s.d.)

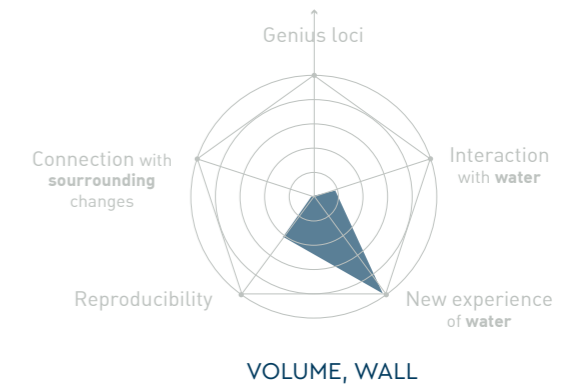
Figure 48, 49. Swimming pool, Leandro Erlich  
Source: [www.leandroerlich.art](http://www.leandroerlich.art)



50.

## TRIANGULAR WATER PAVILLON

JEPPE HEIN



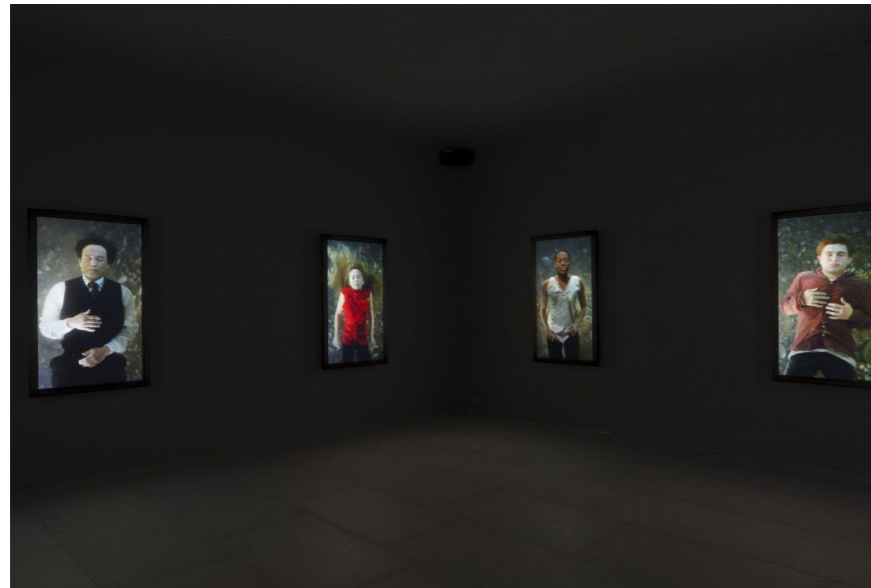
51.

LOCATION: Berlin, Germany  
PROJECT TYPE: Museum installation  
FUNCTIONS: /  
YEAR: 2007

The triangular water pavilion appears to the visitors elevated upon a basin of water. Two of its three equilateral sides are made of two mirrors and the other one of water, creating reflections and distortions. The descent of water is controlled by a sensor so as to let the users enter inside this enclosed space where they feel totally surrounded by water thanks to the reflections of the mirrors. As the two mirror walls simultaneously reflect

each other as well as the water, visitors face a space where the boundaries between the interior and exterior disappear. Water seems to be the limit between inside and outside, appears like the only element that divides but actually it is not: again, the design of materials and lights helped to create a space that evokes the sensation of being immersed in the natural element. (Hein, s.d.)

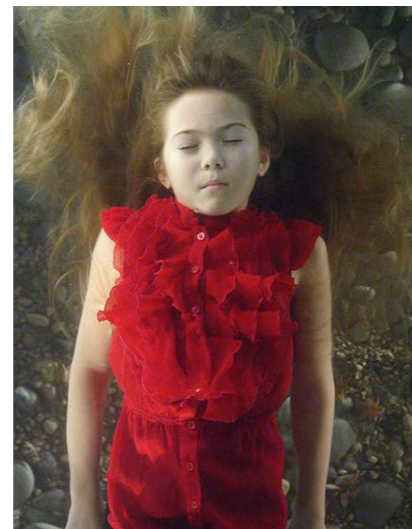
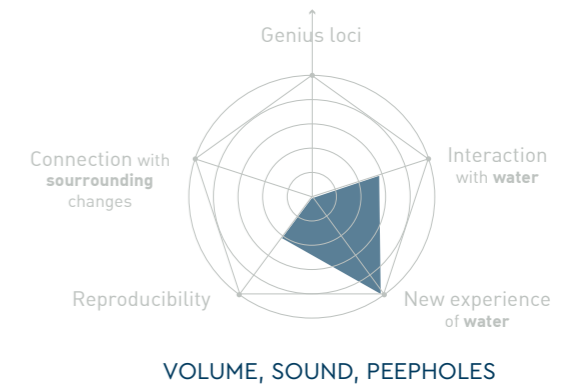
Figure 50, 51. Triangular water pavillon, Jeppe Hein  
Source: [www.jeppehein.net](http://www.jeppehein.net)



52.

## THE DREAMERS

BILL VIOLA



53.

LOCATION: /  
 PROJECT TYPE: Interactive installation  
 FUNCTIONS: /  
 YEAR: First exhibition 2013

As already mentioned in Chapter 2 of this study, in Bill Viola's artworks, water and time play a main role. In "The Dreamers" the immersion the visitor experiences is total, they can see and hear water despite being completely dry: a black room hosts the people that find themselves in front of seven screens, as if they were windows on the outside, where seven

different people are lying on the sea bottom dreaming. A dual immersion takes place, the one of the people displayed on the screens and the one of the visitors, one with water, one without, both totally disconnected from the outside, in a space where the perception of time is completely subjective. (Viola, 2017)

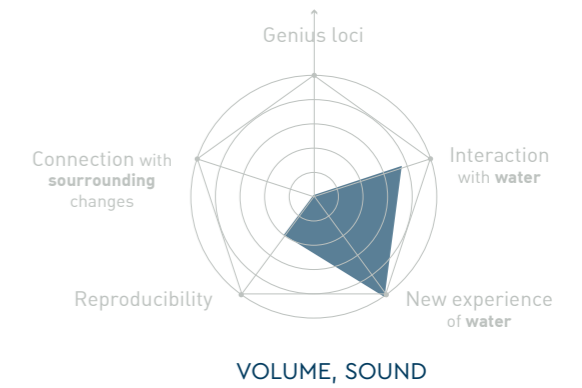
Figure 52, 53. The Dreamers, Bill Viola  
 Source: [www.youtube.com/watch?time\\_continue=46&v=p1M\\_KJ3LP4U](https://www.youtube.com/watch?time_continue=46&v=p1M_KJ3LP4U)



54.

## RAIN ROOM

RANDOM INTERNATIONAL



55.

LOCATION: Yuz Museum, Shanghai, China

PROJECT TYPE: Interactive installation

FUNCTIONS: /

YEAR: 2018. First exhibition 2012

The Rain Room takes inspiration from the fact of being under the rain but it radically changes this experience, first of all locating it in an interior space, secondly because people, even if physically underwater, are never wet. This is a total immersive installation where all the senses are involved and the water is present in enormous quantity, really surrounding the human body. The dark space and the light contributes to strengthening this experience made of the smell of the rain, the sound of it dropping onto an artificial surface and the humidity perceived on our skins that anticipates the entrance in the room. The whole installation is based on a technological system installed on the ceil-

ing made of cameras and sensors: as soon as the visitor enters the rooms they are in front of a huge quantity of rain and the only possibility they have is to walk under it. As soon as they start walking they discover that the rain stops dropping if the body is under it but it is necessary to walk slowly allowing the sensors to perceive their presence. (Ferraioli, 2018)

The immersion inside the space is total as is the disconnection from outside, a strict relation between water and the human body is created and. The visitor needs to explore the space, understand it, create a harmony between their movements and the rain, find the right timing of each step so as not to get wet.

Figure 54, 55. Rain Room, Random International  
Source: The Author

## 3.5 CONCLUSIONS

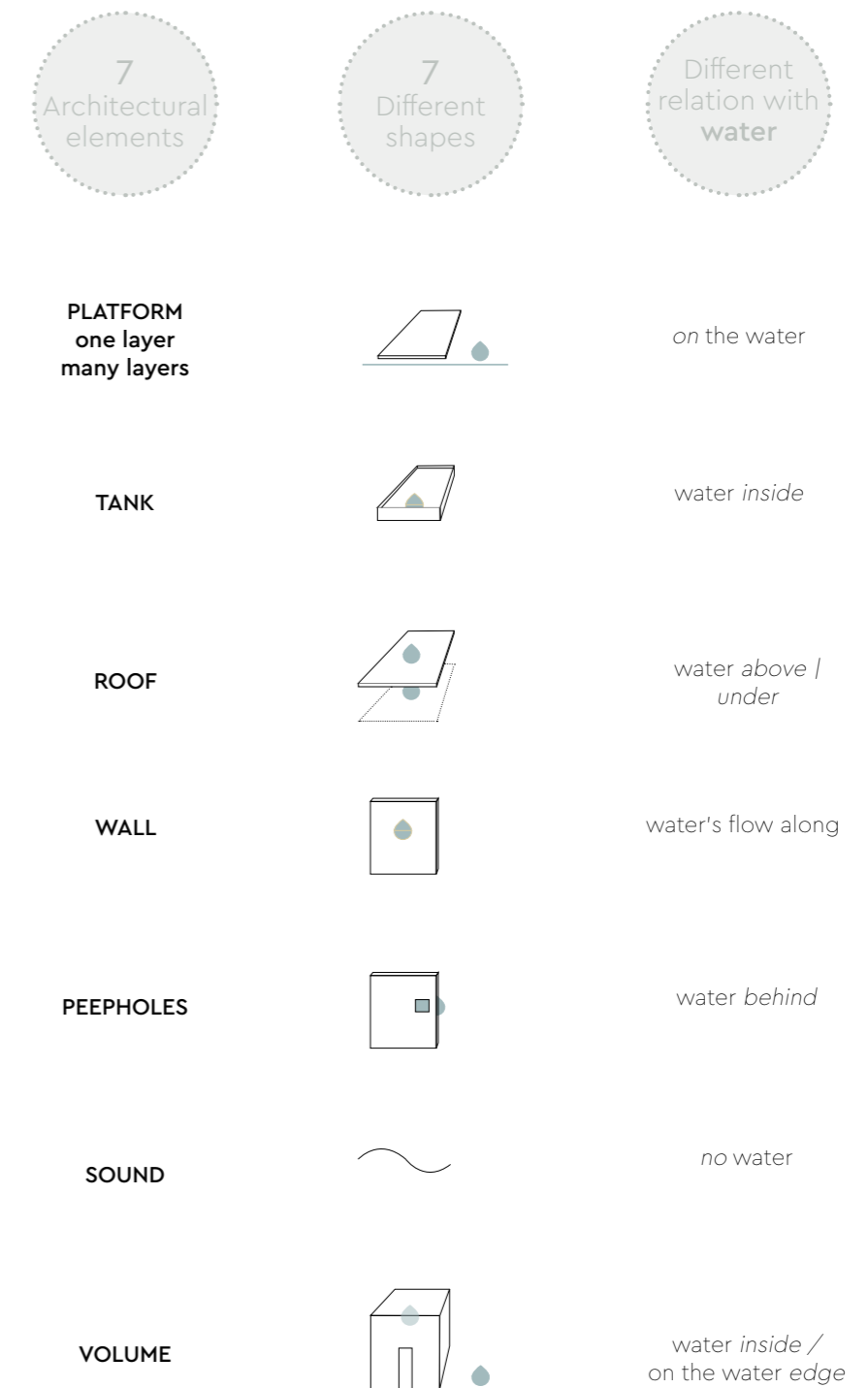
The subdivision into three categories have been meaningful to understand how to design interaction with the natural element at different levels until the total one: immersion, both physical and metaphorical.

The comparison of all the radial graphs within each category made possible to underline the weak points of each group and the constant ones and so the possible main focus of a project that aims to be more effective.

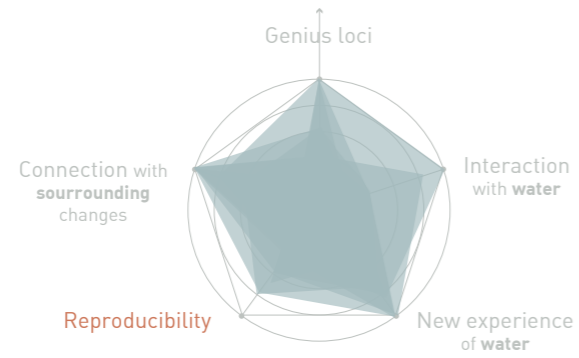
If we look at the first two graphs, we can see that all the variables are touched at least ones that means that, if the key points of each project are put together the result will satisfied all the variables but, if taken singularly it is clear that some values are not reached sufficiently. Among all the variables the connection with the surrounding's changes resulted the most ranked, showing clearly the opportunity of considering this aspect within a project about water and the reconnection with its context. Conversely, all of them resulted lacking partially or totally in reproducibility, in particular, the section "underwater". Among the three categories this last one pointed out the majority of low values, especially the connection with the surrounding and its peculiarities (genius loci) opening the possibility of embracing the challenge of creating a space that simulate the sensation of being immersed, adaptable in different realities and where there is an effective interaction with the natural element.

On the other side, the architectural elements assigned to each project have been grouped in main categories according to their function and, as a consequence, seven typologies resulted, each one having a different relation with water. In addition, what came out from the study of these cases is that each "object" can exists alone or associated with one or more, as the "volume" typology that can contains some or all of the other elements so becoming, among all, the most complex architectural object in terms of relation with water.

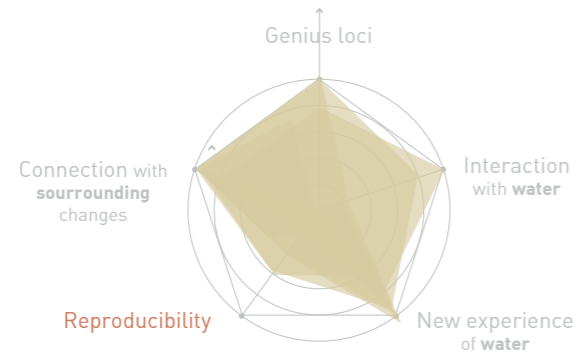
In conclusion, the seven elements represent possible ways in which the interaction with the blue body can be designed according to the three categories, mentioned in the paragraph 3.1. They are the binder between the theoretical part of the current research and the practical part, its design application. They are physical objects that allows, on one hand, the presence of water in artificial environments and, on the other side, favour the contact with it. They are guidelines for possible interventions that aim to build a dynamic relation with water in the urban context, and considers the natural element as a living object, always changing so as the experience of it.



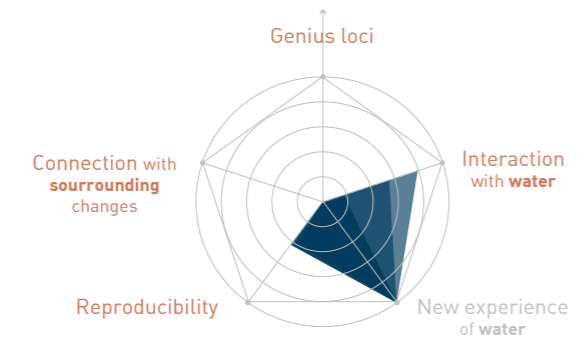
1  
New points  
of view on  
urban water



2  
Live  
architecture



3  
Underwater



Comparison among the different categories of case studies according to the same variables  
Source: The Author



# 4 FIELD RESEARCH

The following chapter lists the reasons that have driven the choice of the site, provide some general information about the context where it is located and a basic knowledge about the previous use of both, the context and the site itself. Follows the site analysis conducted by the Author in different sessions to understand the architecture, the users and the way in which they live the space.

## 4.1 ALONG THE RIVERFRONT

A primary observation led to the elaboration of the problem statement on which the whole research is based: the absence of a contact, different from the visive and static, with water and a missing involvement between it and people; it also showed the willingness of Shanghai's inhabitants to spend time nearby it for recreational activities. The desk research conducted later made possible to understand some of the main reasons of this current situation and showed extensively **the value of keeping citizens nearby the water when creating spaces of restoration**, far from the stress of the city. Above all, it pointed out how much water could improve all those activities that Shanghai's inhabitants everyday decide to do in front of the water.

All these findings, both empirical and scientific, made reasonable the choice of setting the project directly on water, along the main waterway of Shanghai, the Huangpu riverfront. Among all the possible areas of the Huangpu riverfront, the East Bund resulted to be the most coherent with the research conducted. As showed in the background of this study, this area is considerably connected to the development of Shanghai as a port city, some projects of reconnection have been already completed, involving the citizens more than in other areas. However, the interaction with the natural element is still poor providing reasons for focusing the intervention in this part of the city. The secondary observation, conducted along the East Bund with the aim of a better understanding of the geography of the area, moved the focus in one of the green sections of the Expo Park: the **Houtan Park**. Some aspects of the Houtan Park such as the proximity to the river, the previous industrial use of the site, the fact it is part of the Expo park and the presence of a water treatment purification system inside, made reasonable to involve this green area in a project that aims to connect the city of Shanghai, the presence of water in it and its citizens.



56.



57.

Figure 56. East Bund riverfront, Shanghai  
 Figure 57. South Bund riverfront, Shanghai  
 Source: The Author

## 4.2 HOUTAN PARK

The Houtan Park is part of the bigger Expo Park project, opened in 2010 in occasion of the World Expo held in Shanghai; it is one out of the three green areas created inside this green belt opened in 2010 along the river, including the Shi-bo Park, similarly on the eastern bank, and the Jiangnan on the western.

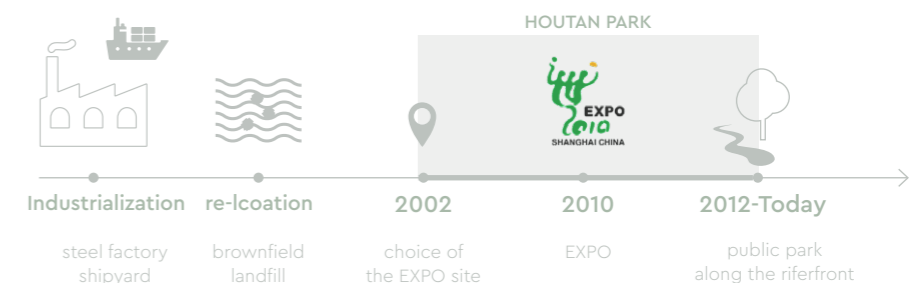
As already mentioned in the background of the research, this big event, whose theme was "Better City, Better Life", led to many renovations all over the city and in particular along the riverfront with the aim of enhancing the presence of public spaces for restoration of city dwellers and rebuilding a connection with water.

The Expo site covers a surface of 5.28 km<sup>2</sup> of which 3.93 in the Pudong area on the south-east bank of the Huangpu River and 1.35 on the opposite side of the river, in the north-west part of the Puxi district, similarly on the water. The site is within an industrial area because of the presence of the Bailianjin Canal and the Huangpu River that seemed to be the most proper one to set up industries and shipping trades. When in 2002 the site was selected for hosting the Expo, it was already almost empty and the majority of the industries had already been moved, leaving architectural relicts and a highly polluted environment. Because of the strong identity of the area, it resulted necessary to work, in parallel with the sustainable and ecological themes, on the memory of this previous industrial soul in order to create an Expo strictly related with the host city. (Li Y. , 2012)

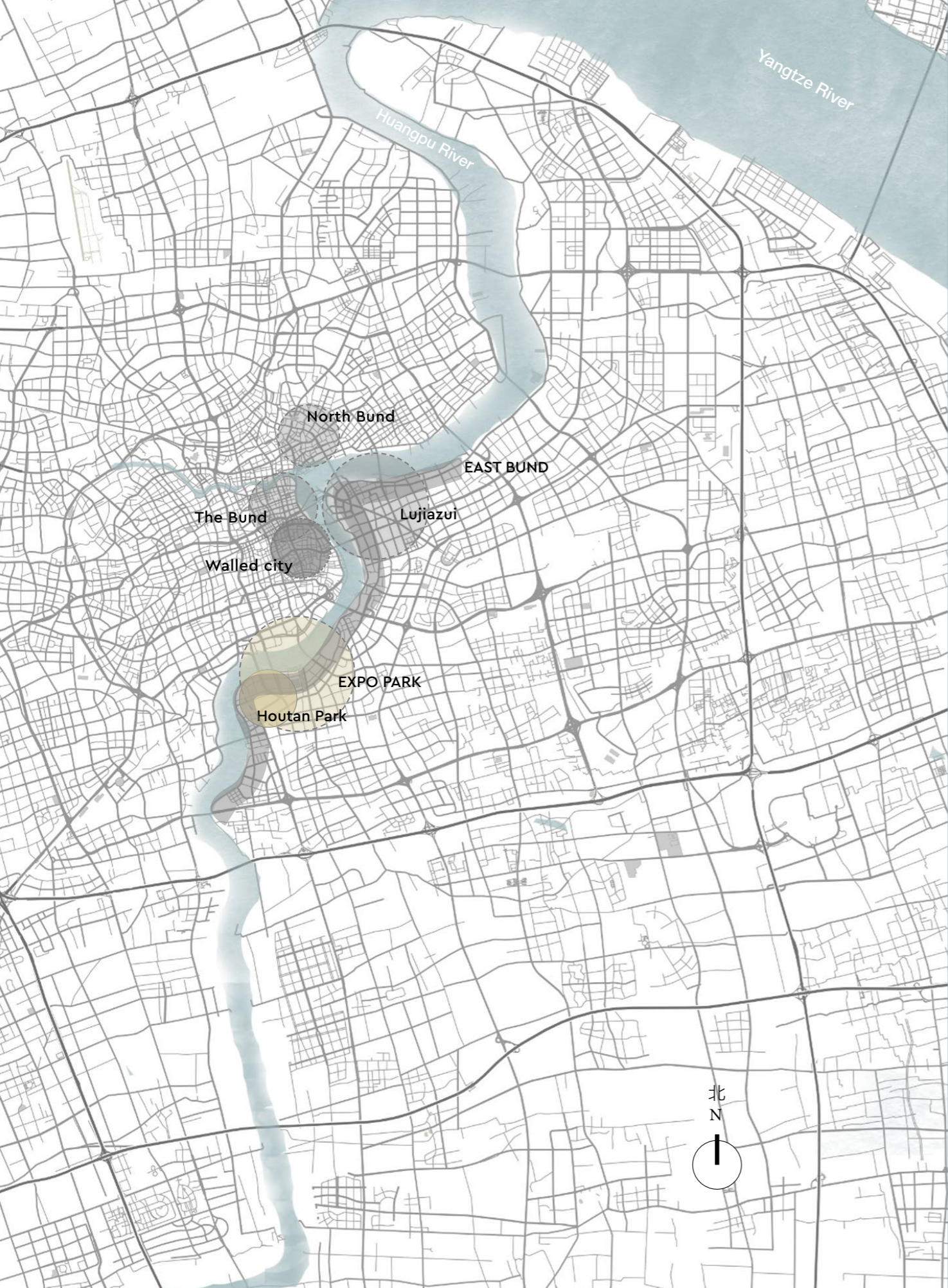
The idea of the Houtan Park grew exactly with the aim of building a better city and so to increase the quality of Shanghai's inhabitants' lives while keeping the traces of the area's past and solving the big problem of the quality of the environment.

### 4.2.1 Houtan Park: a project of requalification

Shanghai Houtan Park, designed by **Turenscape studio**, a Beijing based landscape architecture office, winner of the World's Best Landscape award at the World Architecture Festival Awards in **2010**, is a 140,000 square metres site, located along the east bank of the Huangpu River, in the west side of the Expo Park. The objectives of the architects were to create, temporarily, a green Expo and so a green park that could host the great number of visitors during the event demonstrating the power of green technologies and, on the other side, permanently, an open public waterfront.



Timeline of Houtan Park area  
 Source: The Author



Houtan Park



< Huangpu River crossing Shanghai, East Bund  
^ Location of the Expo Park and the Houtan Park along the Huangpu River  
Source: The Author

The main challenges of the space derived from the previous use of the place. In fact, before 2007, when the design was initiated, the site was a brown field, mainly used as a landfill and lay-down yard for all the industrial materials that belonged to the steel factory and a shipyard that used to be there.

Because of the heavy metal in the ground caused by the previous presence of industries, the entire wildlife had been contaminated and the quality of the water in that area was severely compromised. According to the national water quality ranking, its value corresponded to a Grade V on a scale between I and V, where V stands for unsafe water for contacts such as swimming, and for aquatic life.

The river itself represented one challenge and not only for its quality but also because of the presence of a floodwall that was restricting public access to the waterfront. In fact, the disparity of the values between the high tide, around 3.3 meters, and the low one, 1.2, had generated the necessity of creating a solid and rigid concrete structure with a top elevation of 6.7 metres, to prevent the Huangpu River from flooding, which average tide elevation is usually around 2.2. Once the hypothesis of keeping that wall was eliminated because seen as an obstacle for the contact between people and water and, on the other hand, for the growth of aquatic life, another challenge came about: how to protect the city from flooding, re-establish a contact with the waterfront in such a narrow space where a sloped waterfront seems to require more space than the one available? The form of the site soon resulted to be another problem, since it was necessary to solve this flood issue and organize a public space in an area of only 50 to 80 meters width, with the narrowest portion of land of only 30 meters and 1,700 metres in length.

Last but not least, the Turenscape architects had to maintain the previous identity of the place being sure to create a distinctive park that stood out, simultaneously, among the huge number of exhibitions and modern parks in Shanghai, a place with exhibition functions that was ecological, educational and circulation friendly for people.

The solutions to all these challenges came with the concept and the design strategy. Soon the project became a great example of both how to design a *living system* and how to keep the *memory* of the past in such a contemporary urban public waterfront.

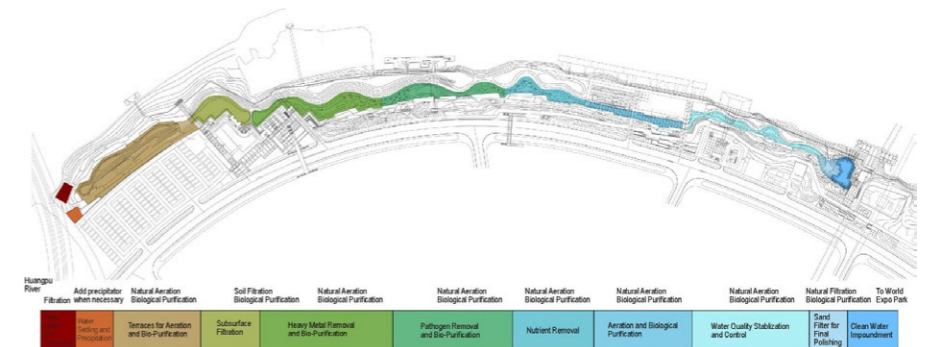
The park was meant to be a living organism, rather a park that has the ability to adapt, change, and protect itself, needing low maintenance and, at the same time, performing highly. It was designed as a living machine that provides many ecological services such as supply (food, water and energy production), regulating (water purification, carbon sequestration, climate regulation, waste decomposition, detoxification, crop pollination, and pest and disease control) and supporting services such as primary production. The cultural aspect was considered too, intending the place as the opportunity for people to approach ecotourism and scientific discoveries within recreational experiences. For this reason, all the vegetation was chosen taking into consideration the seasonal changes and so meant to allow people to experience the living nature of the system.

Wetland plants, wildflowers and native trees were planted to form a green and ecological landscape to escape the frenetic metropolis and solve the main issues of the geography of the place, respectively. In fact, all the vegetation was chosen in order to contribute to the reduction of pollution, prevent the bank

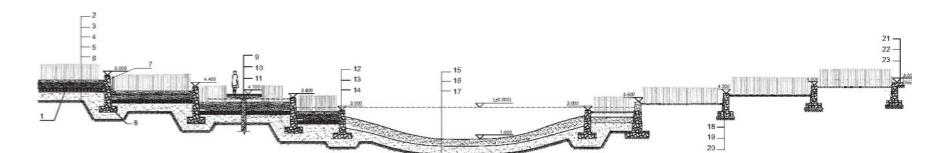
erosion and enhance the aquatic life. In particular, the willows and the reeds were planted to reduce the pollutants in the water and strengthen what the water treatment system placed in the park had been designed for.

The highly contaminated water coming from the Huangpu River is redirected to the treatment area through some pumps, then, via a series of wetland cells, biologically treated so as to improve its quality from Grade V to Grade III that allows it to be used safely for landscape irrigation and other non-potable applications, as demonstrated during the period of the Expo.

This wetland treatment system represented not only a pilot project to test the capability of cleaning water demonstrating the possibility of treating over 2,400 tons of water per day, but it also created the opportunity of creating a new waterfront. On a different level from the Huangpu River, a small stream, with an overall average of 10 meters width, offers people, both children and adults, the chance to look at different aquatic habitats in an educational and recreational way. A series of stairways, catwalks and platforms enhance the relationship with the water allowing a safer and healthier contact with it thanks to its treated

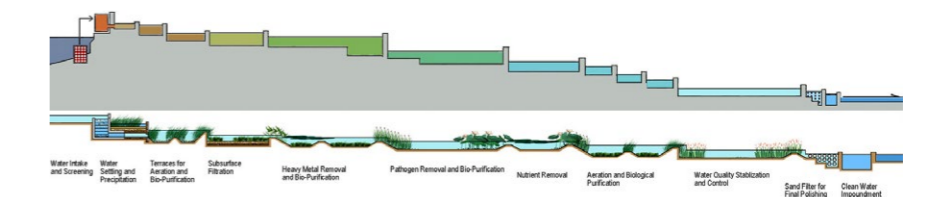


58.



- 01. seepage control
- 02. sand, 400mm
- 03. rough sand, 400mm
- 04. gravel, 300mm
- 05. clay compacted in layers, 600mm
- 06. existing prime soil
- 07. overflow port
- 08. mortar bonded rubble retaining wall, 400mm
- 09. bamboo paving, 45mm
- 10. antiseptic keel, 50mmX50mm
- 11. reinforced concrete beam
- 12. mortar bonded rubble retaining wall, 400mm
- 13. clay compacted in layers, 600mm
- 14. existing prime soil
- 15. sand, 400mm (zeolite stone 3-5 pieces/m<sup>2</sup>, each 60-120mm wide)
- 16. clay compacted in layers, 600mm
- 17. existing prime soil
- 18. rubble, 400mm
- 19. C15 reinforced concrete, 100mm
- 20. prime soil compaction
- 21. rubble, 800mm
- 22. rough sand, 100mm
- 23. prime soil compaction

59.



60.

Figure 58, 59, 60. Houtan Park's Water Treatment System, masterplan, sections.  
Source: adapted from <https://www.plataformarquitectura.cl>



61.



63.



62.



64.

Figure 61. Houtan park, Water Treatment system, March '19  
 Figure 62. Houtan park, Water Treatment system, April '19  
 Source: The Author

Figure 63. Houtan park, green areas, March '19  
 Figure 64. Houtan Park, green areas, May '19  
 Source: The Author

The concept of the living system, and so the use of vegetation and natural elements in general, have been maintained also to solve the second big issue of the area: the water level.

As mentioned before, it resulted absolutely in contrast with the essence of the project to keep the pre-existing flood wall, the lack of space was an obstacle for other solutions and so three different systems were adopted: natural vegetation, an already existing dock with the function of flood wall itself and a new riprap made of stones. This riprap system was designed to replace the concrete wall leaving the possibility to the native green to grow, to the aquatic presence to stay alive and overall, to rebuild a strong visual contact with the water and also a more natural sound experience of it. In fact, thanks to this new flood control, people can feel less the impossibility of accessing water and what is more, they can see it and hear the sound of the waves touching the rocks.

As already mentioned, the space had a deep relation with the history of Shanghai and in there many connotative elements of this past were present.

The cultural background of the site has been kept and the three different periods of evolution it underwent were inserted into the living system: the architects decided to realize this living machine overlapping the concept of memory, in particular matching together, the fishing, the agricultural and the industrial past of the city.

The first layer is the one represented by the waterfront itself, its regeneration led to return to a Pre Tang Dynasty (AD 618–907) habitat when Shanghai was no more than a small fishing village and people in the area made their living by fishing and hunting along the water.

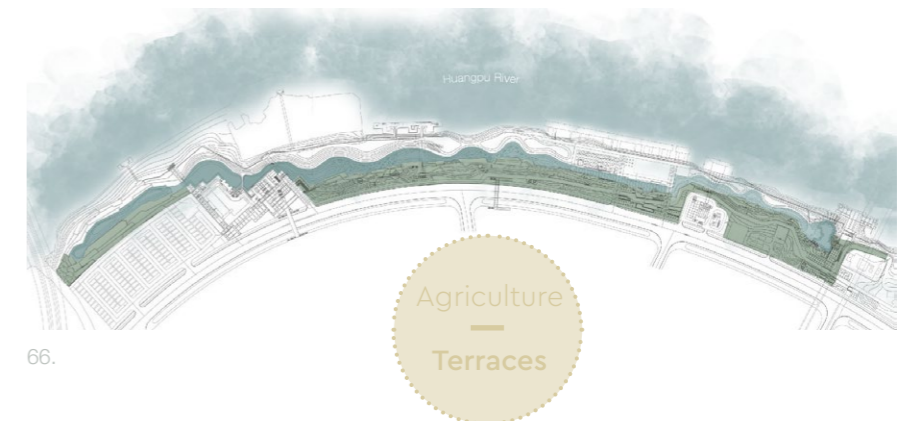
The second one is constituted by the terraces created in order to solve the 3 to 5 meters elevation change from the water's edge to the street and simultaneously to purify the water. They refer to the agricultural past of the city when, from the Tang Dynasty to the start of the industrial development, agriculture was one of the main activities. Their presence not only is a reminiscence of the Chinese landscape but provides also the possibility of learning more about agriculture and farming even in the urban environment; the different plants that blossom in different periods of the year enhance curiosity on the diversity of the landscape and reconnect people to the land. The paths along them favour the experience of this particular landscape and make the access to them easier and direct.

In addition, the third phase of Shanghai's history, the more related to the site's soul, its industrial spirit, is made alive again thanks to the re-use of the pre-existing structures and materials. What during the Expo was named as the Hanging Garden and the Ludi platform are examples of this adaptive reuse. What is more, the materials found in the landfill have been reconfigured in order to create pieces of art or architectural elements, as they were relics of the site that belong to the past but provide frame views on the new Shanghai with its skyscrapers and new buildings. As a consequence, the path network becomes interesting not only from a green point of view but also for the platforms and containers obtained from the pre-existing steel structures, that represents a way to feel the industrial essence of the site and to stop and gather. (Yu K. , City green: Landscape as a living system Shanghai 2010 Expo Houtan Park, 2015) (Shanghai Houtan Park, 2015)

1  
Pre Tang  
Dynasty



2  
Tang  
Dynasty  
(618–907)



3  
Industrialization  
from  
1843 on

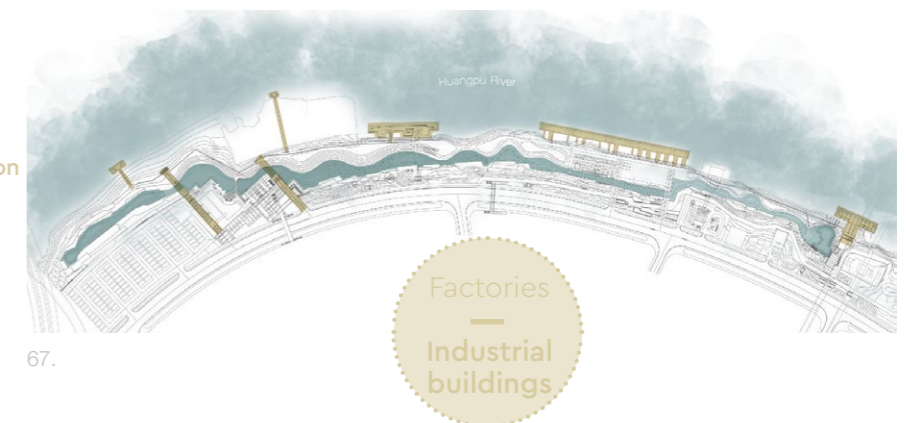
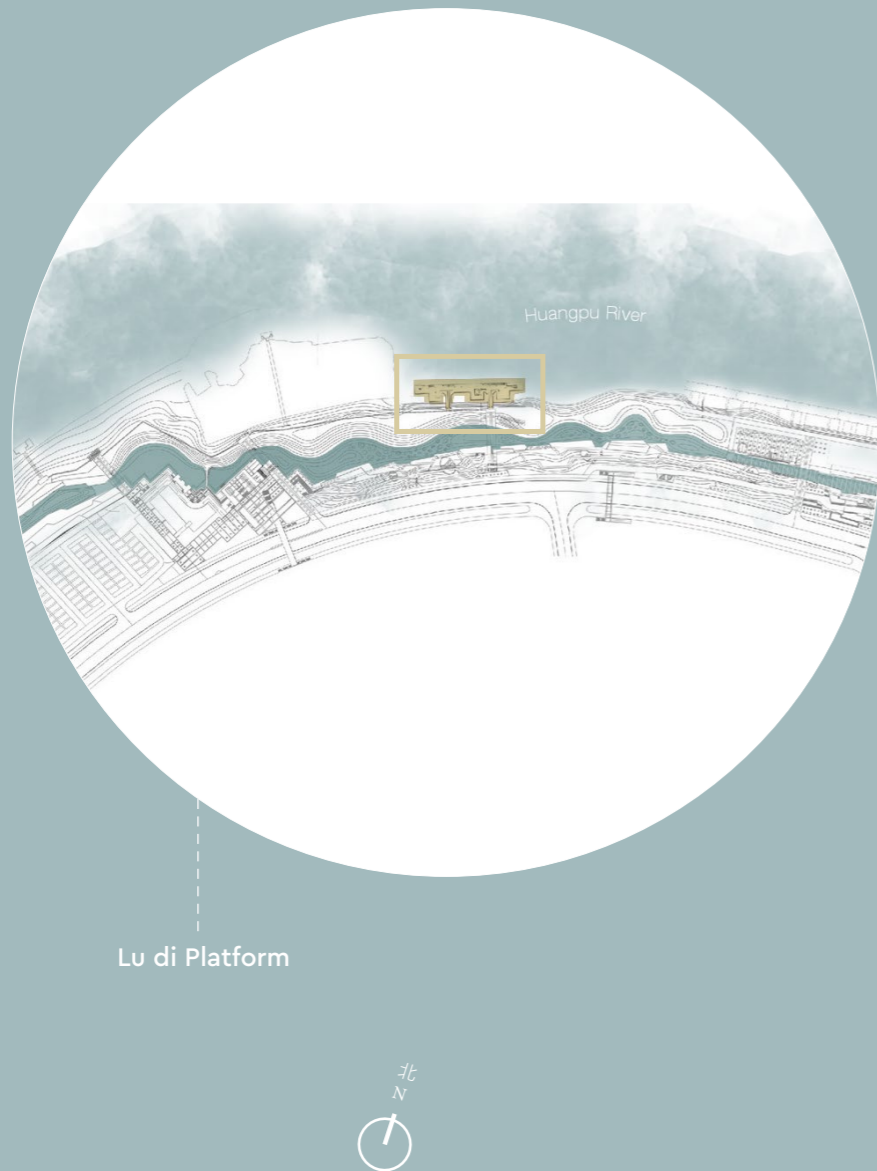


Figure 65, 66, 67. Masterplan of Houtan Park showing the three different layers of intervention  
Source: adapted from www.Turenscape.com





### 4.3 LU DI PLATFORM

The Lu di Platform, 芦荻台 in Chinese, is located in the middle section of the park where once used to be a cargo pier which today is not operational anymore. Turenscape studio decided to preserve the pre-existing dock surrounded by wetlands, taking advantage of the environment all around, and to transform it into a viewing platform, also known as the "Floating Garden".

***"Today it is an observation platform where visitors are immersed in the wetland with views of Shanghai's skyline. An industrial-style installation was constructed using steel panels reclaimed from the site. These modern industrial art pieces merge with the wetland vegetation and landscape pattern as a juxtaposition of the site's past and present."***

*(Yu K. , City green: Landscape as a living system Shanghai 2010 Expo Houtan Park, 2015)*



Figure 68. Masterplan of Houtan Park showing Lu di Platform location. Source: adapted from www.Turenscape.com



69.



70.

Figure 69, 70. Lu di Platform **before** and **after** the project by Turenscape studio  
Source: [www.issuu.com/dianacaletena/docs/diana\\_caletena\\_theory\\_dissertation\\_](http://www.issuu.com/dianacaletena/docs/diana_caletena_theory_dissertation_)







71.



73.



72.



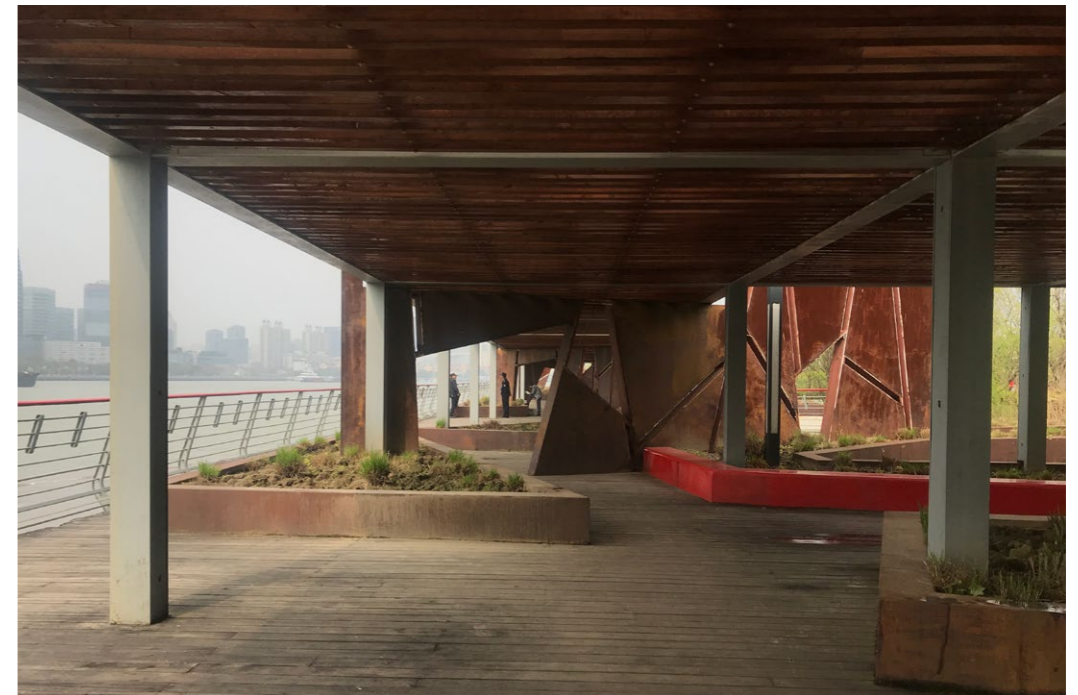
74.

Figure 71, 72. Lu di Platform entrance and inside view  
Source: The Author

Figure 73, 74. Lu di Platform from the park  
Source: The Author, [www.altervista.com](http://www.altervista.com)



75.



77.



76.



78.

Figure 75, 76. Lu di Platform  
Source: The Author

Figure 77, 78. Lu di Platform  
Source: The Author

### 4.3.1 Why Lu di Platform

Among all the areas of the park, Lu di Platform is the one more exposed to the Huangpu River, "the water of the city", it is surrounded by it completely. What is more, the previous use as a cargo pier makes it a keeper of the memory of Shanghai as a port city which development is strictly connected to the presence of a navigable river.

The intervention designed by Turenscape studio in this point of the park created an area where to stop, be far from the sound and fast speed of the urban environment and immersed in the surrounding, where people find restoration nearby the water. On the other side, it showed, again, the absence of a contact that is not only static, not only visive. Thanks to the project inaugurate in 2010, today the site is strong in bringing people nearby the river but lacking in creating a connection to them and the natural element.

All these fact, internal and external to the platform, together with the current condition of the architecture, partially damaged, led to the decision of choosing the Lu di Platform as the place where to start to design the reconnection between Shanghai's inhabitants and the water, where using the natural element to improve restoration that people are looking for when they stay nearby the river.

It brings people **nearby the water** providing them a view on the city and partially disconnecting them from the urban environment



STRENGTH



WEAKNESS

The connection with water is **only visive, static** and often obstructed by the architecture



79.



80.

Figure 79. Strength: Lu di platform brings people near the water

Figure 80. Weakness: on Lu di platform the contact with water is only visive due to many obstacles

Source: The Author

### 4.3.2 Site analysis

The first aim of the site analysis was to study the entity of the place, the architecture that characterizes the space and what there is around and which is the relation between the platform and the surrounding so as to understand how the project could have been related to the pre-existence and how it could have taken advantages of what is already there.

On the other side, the purpose was to discover how people use this space and how their way of living could have been improved.

in order to guarantee the spontaneity of the stakeholders:

**1. Direct observation on field**

**2. Informal conversations** in order to try to catch some insights related to user's background and emotions that did not come out during the observation sessions.

The sessions to collect these data are five and they have been conducted along a period of around two months, from the end of March until the beginning of May; they took place in different hours of the day and in different days of the week, in many weather conditions so as to have a broader overview and understand if the behaviours are changing according to some variables or not. These activities have been recorded through photos, videos, texts and sketches and later elaborated so as to obtain a list of insights useful for the project development.

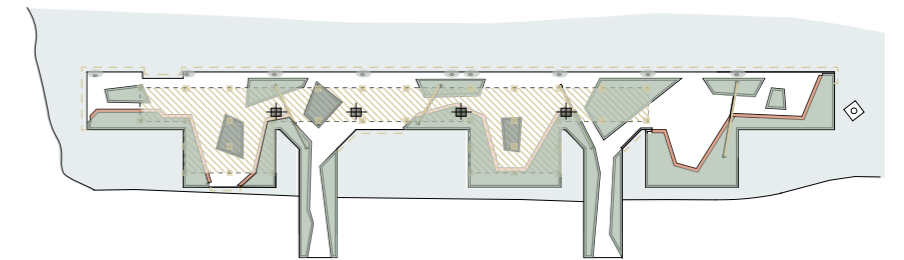
#### 4.3.2.1 Arhitectural elements and materials

The project designed for the platform before the opening of the park in 2010 is what today makes it different from the other piers in the same area.

The architural elements today present on the site characterize it a lot, for this reason, an analysis of them, their materials and the current layout resulted necessary in order to understand the role of what is already there, their importance in spatial terms and how to relate the pre-existing with the future project.

Many are the objects in the space, both vertical and horizontal, some of them as the mooring cleat, the material of the vertical partitions and green islands containers are related to the memory of the place, some others such as the canopy or the parapet are new and have been placed to guarantee a more user-friendly use. Elements like the bench and the green islands are also means of connection between the platform and the general environment of the park, where the changing green and the red segmented line are protagonists. In particular the use of the steel, thanks to a preliminary desk research and the observation on field, resulted a key point of the place.

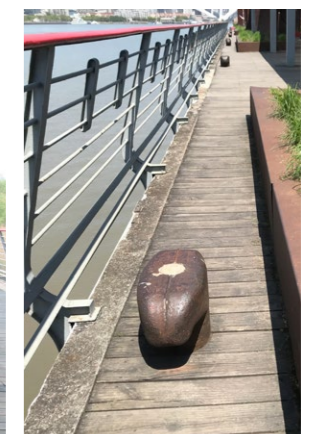
Thanks to the user's analysis conducted simultaneously and explained in the following sections of the chapter, resulted clear the relation that exists between these architectural elements and people's behaviours and which of them seem necessary to guarantee the current use of the platform.



Benches Green islands Pillars Lighting features



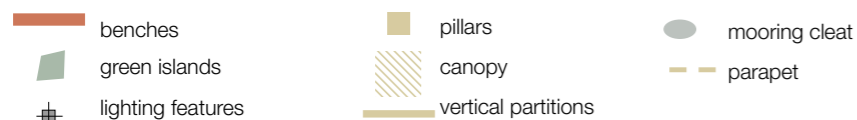
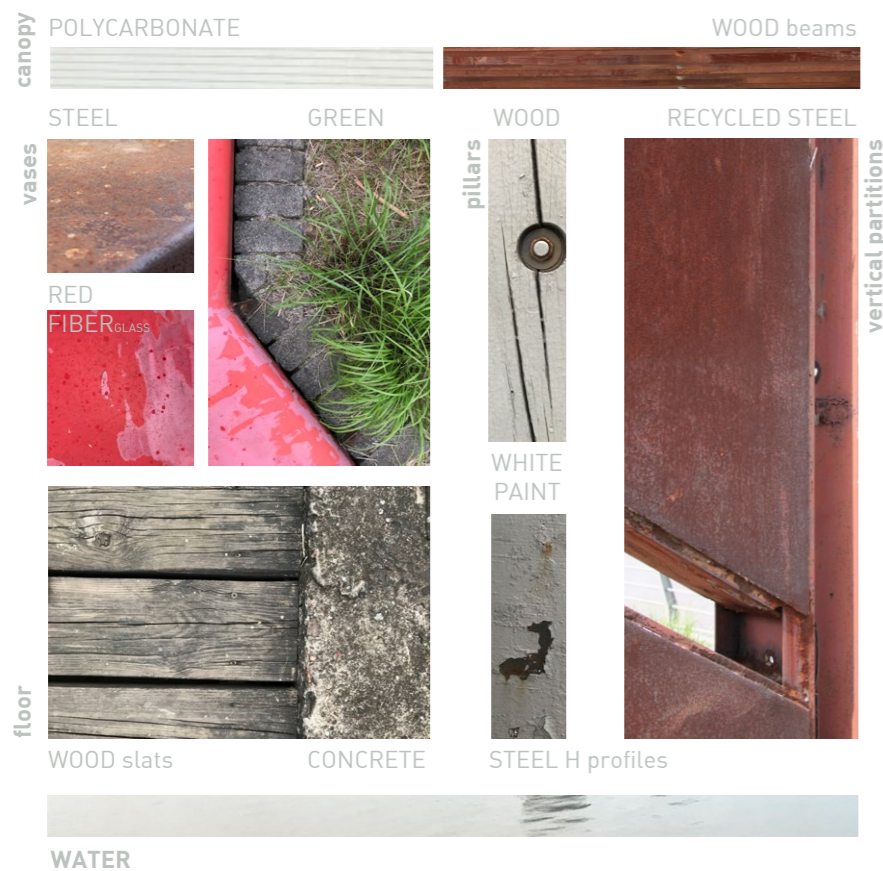
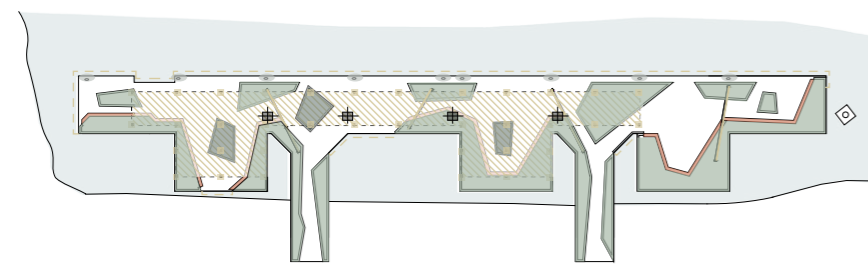
Canopy Vertical partitions Parapet Mooring cleat



- benches
- green islands
- lighting features
- pillars
- canopy
- vertical partitions
- mooring cleat
- parapet

81.

Figure 81. Current layout and architectural elements that characterize the site  
Source: The Author



82.

Figure 82. Current layout and materialboard  
Source: The Author

### 4.3.2.2 A viewing platform

Thanks to a direct observation on field was clear that the surrounding influences a lot the environment of the platform. In particular, two are the main aspects pointed out: the platform is a viewing point on some of the most important landmarks of the city and it undergoes a high level of changes based on the outside conditions.

As already mentioned at the beginning of this chapter, the intervention conducted by Turenscape studio in occasion of the Expo 2010 aimed to transform the previous dock in a viewing platform. What resulted interesting it is that, today, the value of the view increased considerably thanks to the fast development of the city, in particular of two areas clearly visible from the site: the West Bund and Lujiazui in Pudong area.

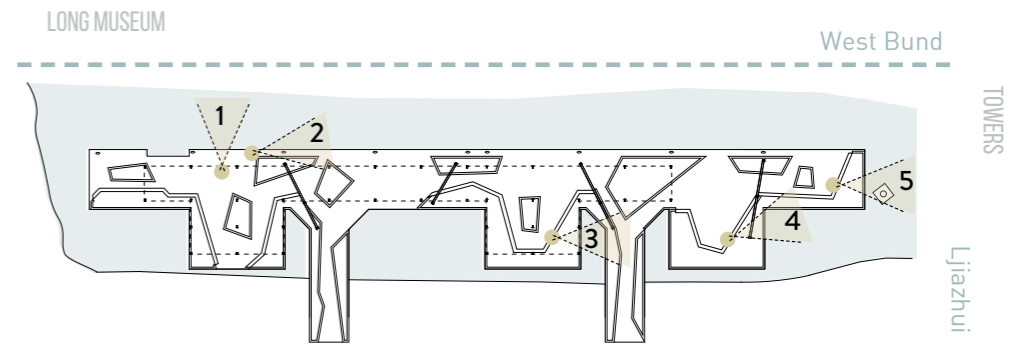
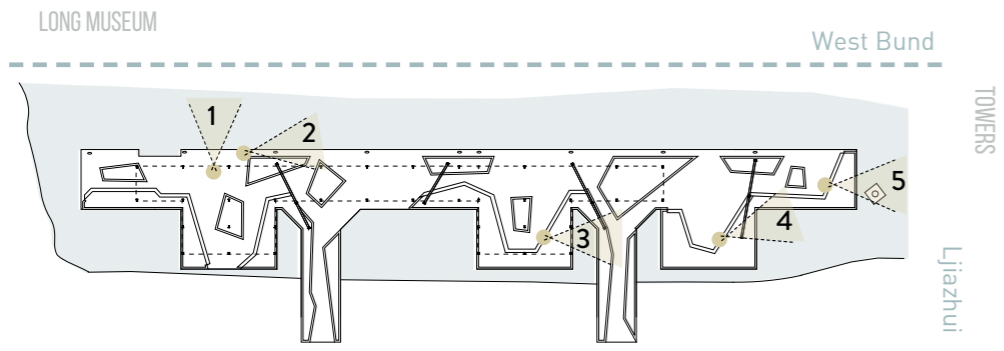
The platform faces the West side, framing the Long Museum, a project opened in 2014 in a place once a wharf for coal transportation, designed by Atelier Deshaus. That side of the riverfront, after a great development became a gathering area highly frequented; the monumental architecture and the activities are clearly perceptible from the Lu di Platform. Similarly, it guarantees a view on one of the main landmarks of Shanghai, the Shanghai Tower, built later than the project for the platform, and on the other towers that characterizes the financial area of Pudong.

Beside the views on contemporary architecture, it keeps the traces of the previous face of the city and the area: immersed in the water, there are some relicts of its past industrial use so becoming a place from where look at the past and the present of Shanghai.

Different observation sessions made also possible to notice that the external environment changes provide to the users an always different experience even for the most usual ones. The perception of the platform and the visibility from the access of the park changes considerably between day and night; at night the architecture almost disappears revealing only the shapes and leaving the scene to the lights of the other side of river. The fact that the site is part of a "living system" makes the green islands spread around always changing according to the seasons and so the site, where in few weeks, the amount and intensity of green is modified visibly.

The other aspects that influences the environment a lot are strictly related to two peculiarities of the city, the *fog* and the *rain*. In those days where the air pollution and the humidity reach high level, the fog is very dense and the possibility of looking at the horizon very low; as a consequence, some of the towers are surprisingly, partially or totally, hidden. Similarly, during the rainy season, the visibility of the landscape decreases a lot. The presence of the rain impacts considerably the platform: on one side it alters the water level, on the other, makes the space almost inaccessible, in fact the materials chosen for the canopy and the floor are not suitable to resist to so much water and the space becomes slippery. The tide can be very high making the platform almost floating and the water reaching the land, or very low creating a shore. In addition, many cargo ships navigate in front of the platform changing the perception of the landscape but also moving the water producing a sound.

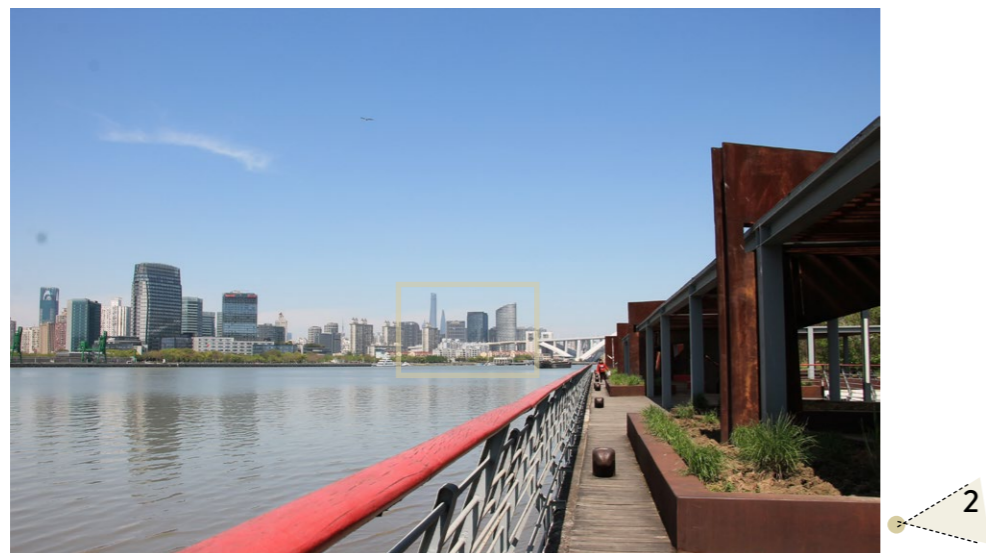
Overall, these insights revealed the opportunity of creating an always surprising public space, despite a frequent use or a long duration of staying during a day.



83.



85.



84.



86.

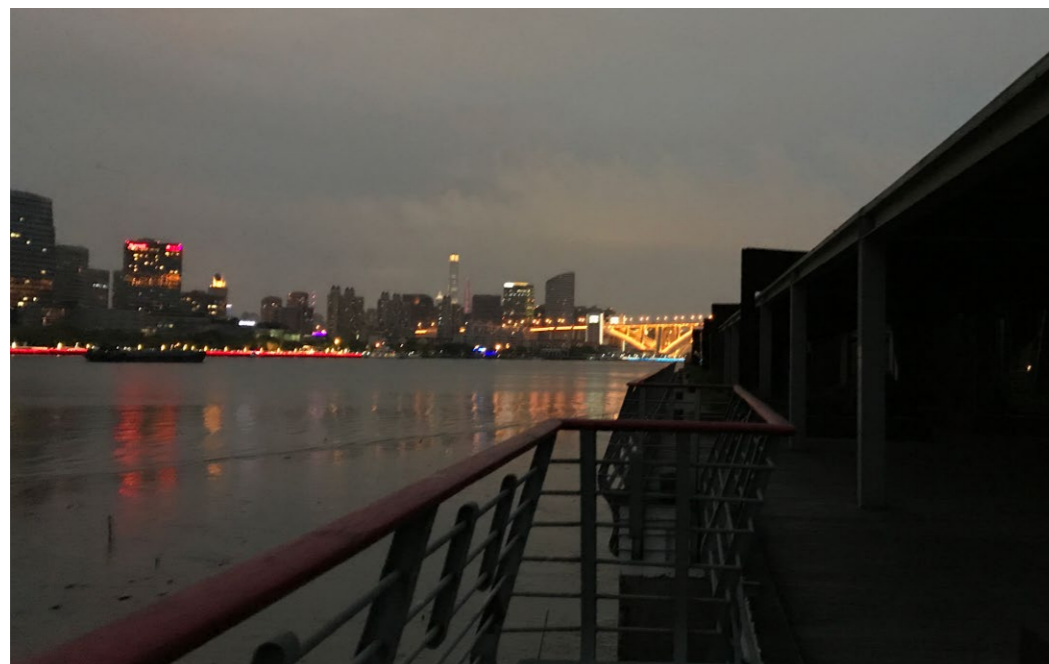
Figure 83, 84. Meaningful points of view according to the current layout of the platform  
Source: The Author

Figure 85, 86. Meaningful points of view according to the current layout of the platform  
Source: The Author

DAY and NIGHT



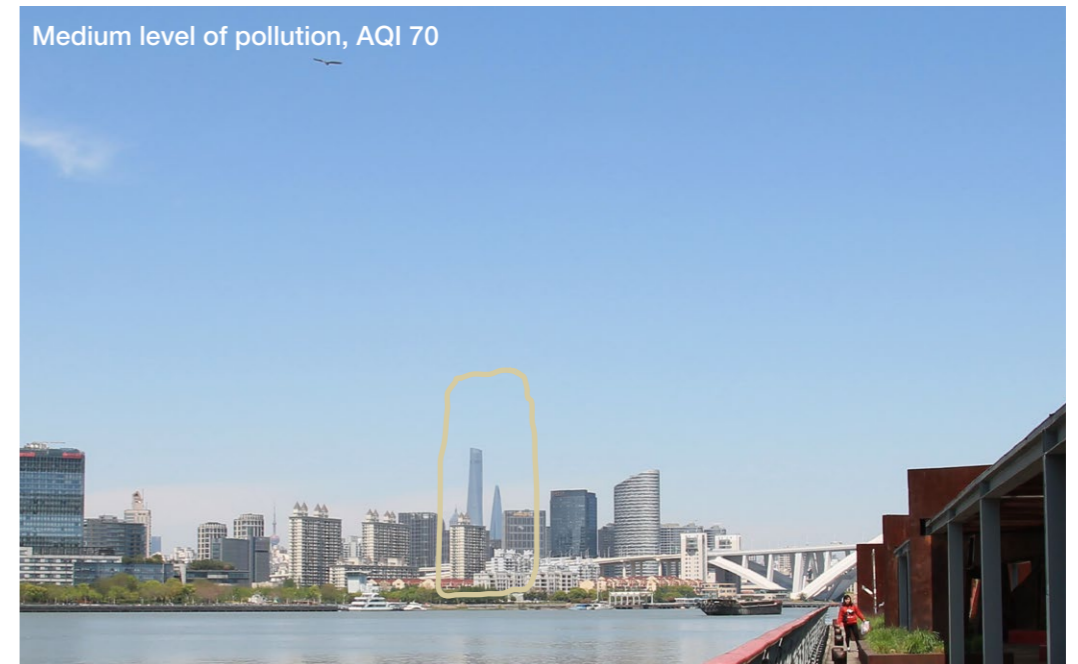
87.



88.

Figure 87, 88. Differences between day and night on Lu di platform  
Source: The Author

FOG 



89.



90.

Figure 89, 90. Differences according to air quality levels on Lu di platform  
Source: The Author

SEASONS 



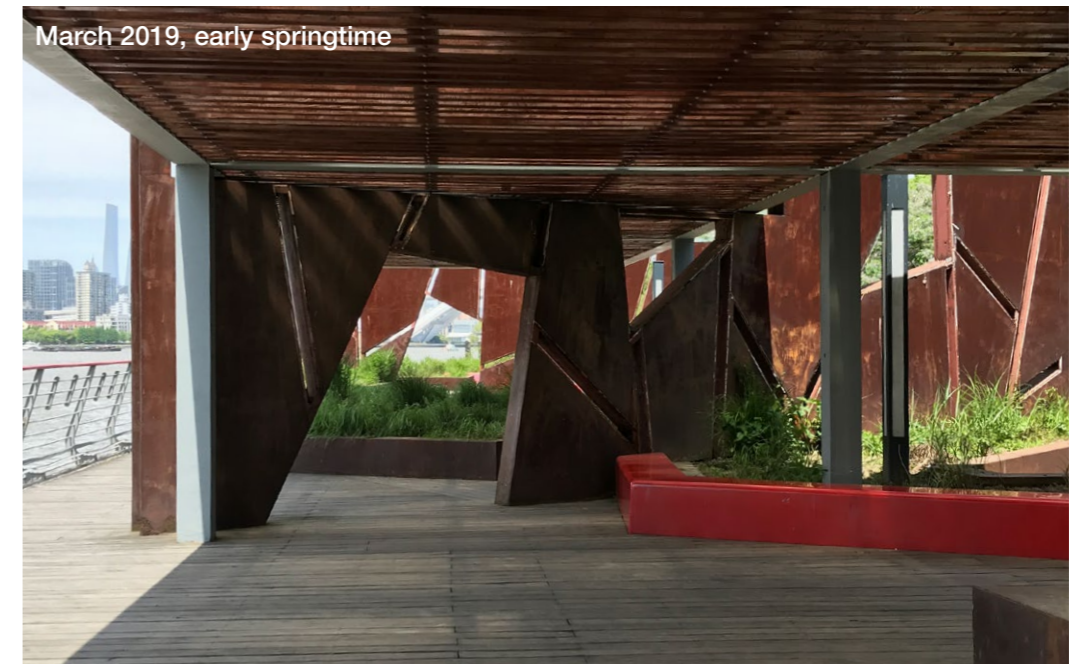
91.



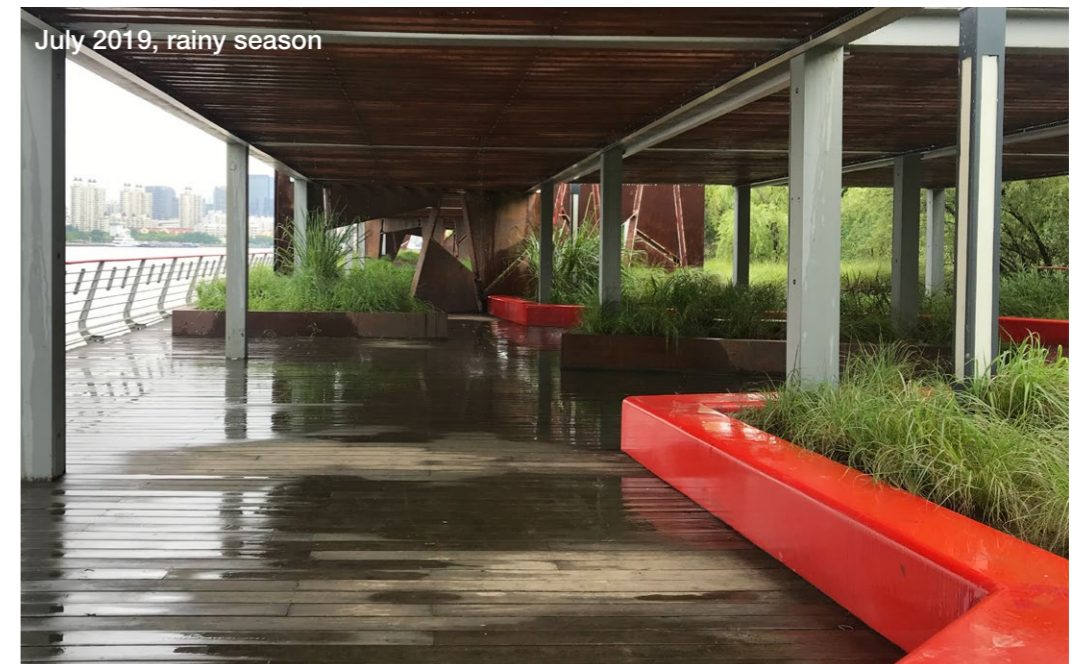
92.

Figure 91, 92. Different vegetation according to different seasons on Lu di platform  
Source: The Author

RAIN 



93.



94.

Figure 93, 94. Dry and wet space  
Source: The Author



WATER MOVEMENT 



95.



96.

Figure 95, 96. Different landscapes from Lu di platform according to the presence or absence of cargo ships  
Source: The Author

WATER LEVEL 



97.



98.

Figure 97, 98. Differences between low and high tide on Lu di platform  
Source: The Author

WATER LEVEL 



99.



100.

Figure 99, 100. Differences between low and high tide on Lu di platform  
Source: The Author

WATER LEVEL 



101.



102.

Figure 101, 102. Differences between low and high tide on Lu di platform  
Source: The Author

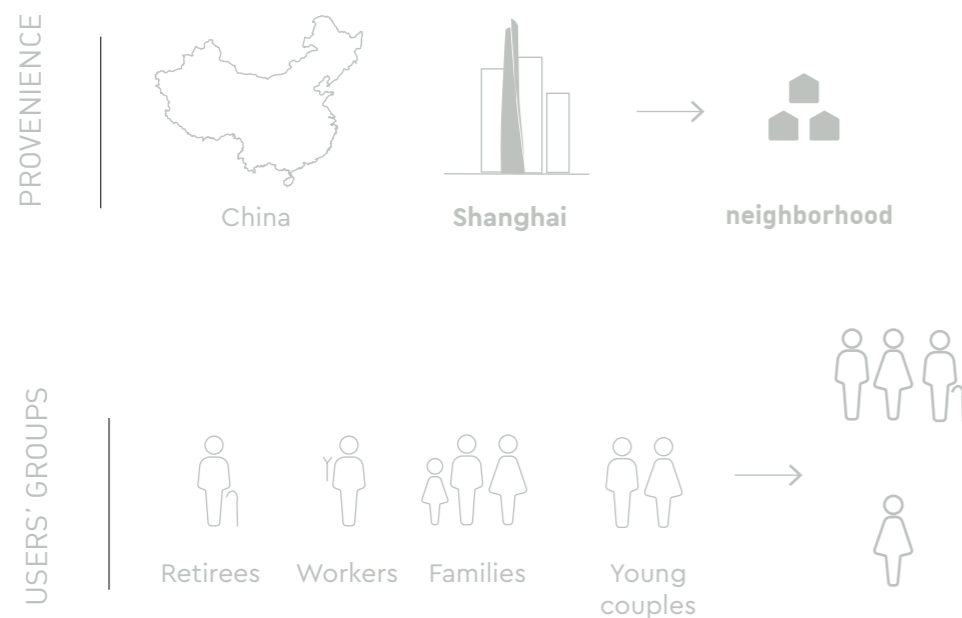
### 4.3.3 Users

The main characteristics of the current users of the site, such as the nationality, the connection they have with the place, age and typology have been outlined thanks to the observation on field.

The importance of the informal conversations resulted in confirming some hypothesis done by the Author while mapping the behaviours and in collecting some information regarding what moves people on choosing that place to stop and spend time there.

The analysis has been conducted on the current users of the site intending it also as the future users of the project, considering the fact that the intervention designed by the Author does not aim to change the current use of the platform but to improve the activities already located there, taking advantage of the proximity of the River and adding a new experience of the water.

The main insights represented in the figure below are that the users are for the 99 per cent Chinese, Shanghai's inhabitants, in particular, they belong to the neighbourhood because of their house or work. This subverted the idea that the place could have been mainly frequented by tourists interested in the Expo Park. It is a space for all, all ages group are present and the way in which they live the site is both in group or singularly, without any distinctions.



Diagrams showing findings about the users  
Source: The Author

### 4.3.3.1 Behavioural mapping

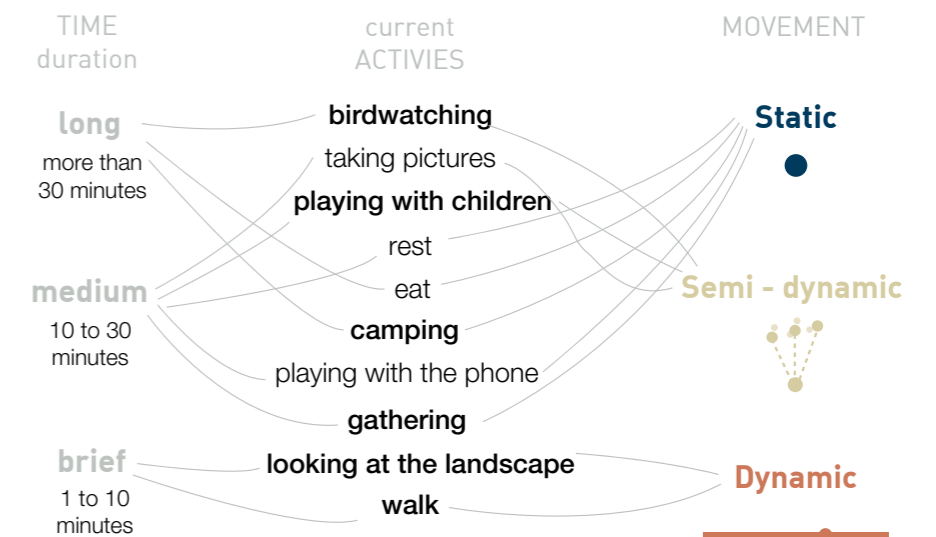
The first phase of the behavioural mapping consisted in the direct observation recorded by photos, videos and rough diagrams of the space. Later these diagrams and pictures have been elaborated in order to obtain clear insights, useful for a deep understanding of how to improve the way in which people already live the site. What is more, as already mentioned above, the observation resulted useful to understand the different typologies of users and elaborate some hypothesis, later confirmed by the informal conversations.

The first findings are related to the typologies of activities that users do on Lu di platform, groupable according to three main kinds of movement, "static", "semi-dynamic" and "dynamic" and to three different duration of time "long", "medium" and "brief".

Conversations happened between the Author and the users directly on site helped to understand deeper the different behaviour as it results from the following extracts.

**Stakeholder 1:** woman, employee: *"I work two kilometres far from the platform. I always come here at lunch break, I think it is beautiful and it relaxes me a lot. Many people do it"*

**Stakeholder 2:** man, retired: *"In winter I spent the majority of time at home. Now, in spring, I come here because I like to look at the movement of the ships in the river. It is about the movement of and in the water."*

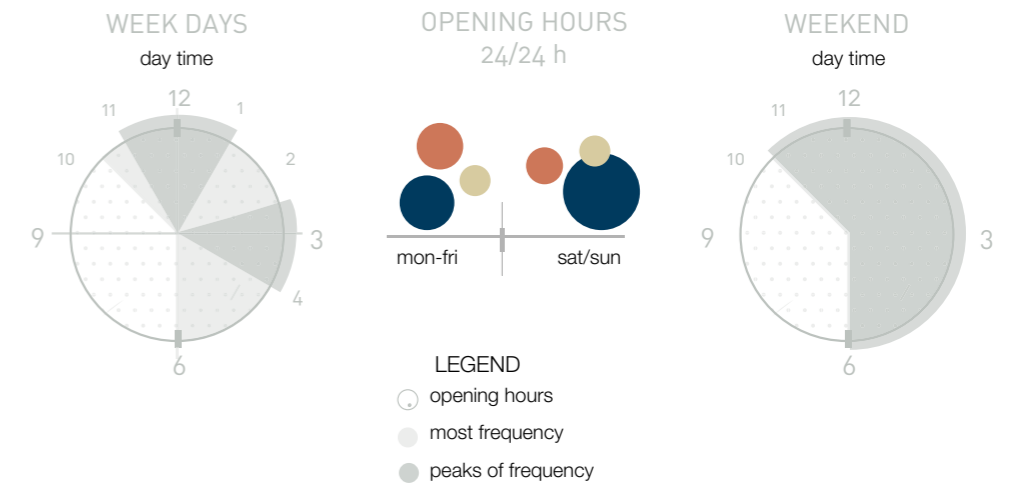


Analysis of the current activities users do on the platform  
Source: The Author

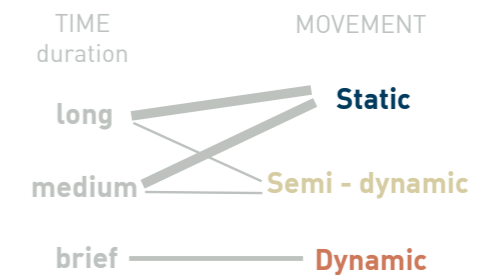


103.

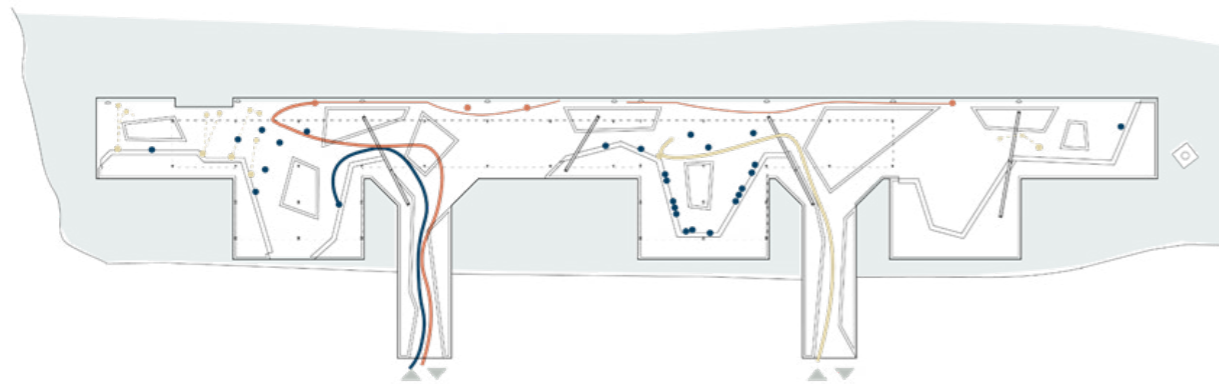
Figure 103. Some of the activities recorded on the platform  
Source: The Author



What resulted evidence is that the static activities are, overall, the more practiced on site, both during the week and the weekend despite the different affluence and use between this two different moment of the week. It is from the behavioural mapping conducted both during the week and the weekend that came out the hypothesis of the presence of people working in the area nearby because of the higher frequency, for a short duration, during the time of the lunch break from Monday to Friday.



Diagrams showing which activities, when and how much users do on the platform  
Source: The Author



104.

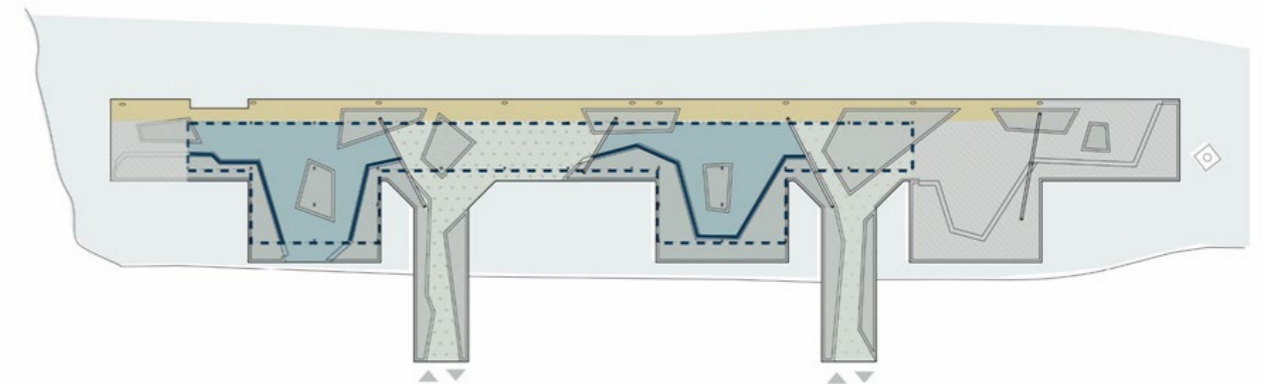
- people / static
- people / semi-dynamic
- people / dynamic
- sample flux static people
- sample flux semi-dynamic people
- sample flux dynamic people

The analysis applied to the space pointed out which are the main factors that determines the people's staying, such as the presence of a place where to sit or where to lay down and the possibility of being sheltered by a cover like the canopy, confirmed by the low use of the areas totally exposed to the outside. A general desire of always facing water while doing whatever activity resulted. The only part, among the ones without the canopy, that is highly frequented is the "corridor" nearby the water where people are used to walk to enjoy as much as possible the presence of the water, the sound, its movement and its level.

It was easy to understand the relation that exists between people's behaviour and the architectural elements on site.

1. The activity of "staying", the most frequent, currently, has nothing to do with the experience of the water, needs a place where to sit, such as a bench or a free space where to lay down or camping. What is more, people resulted to choose only covered spaces to stay, as they were in an interior, and they always look for facing the River despite the presence of the parapet that seems to be an obstacle to the view. When staying, some users prefers to be alone looking for some more private spaces, others, conversely, choose areas of gathering.
2. The areas where there is not possibility of sitting are mainly for transition.

Figure 104. Main fluxes recorded on the platform  
Source: The Author



105.

- EXTERIOR / most used area
- INTERIOR / most used
- weak areas
- canopy - INTERIOR space
- transition areas
- benches most used

3. As a consequence of the first insights, the areas exposed to the weather conditions, without any cover ("exterior"), are partially or totally unused.
4. The dynamic activity consists mainly in walking nearby the river, in this case people appreciate to stay out of the shelter, outside.
5. The green islands all around the space contribute in making the platform a living system, as the whole park, but they are not involved in any way in all the activities, static, dynamic and semi-dynamic.
6. The four vertical partitions divide the platform into different areas

All these insights have been taken into account during the whole design process and each of them became one or more questions. Later, the answers constituted the base for a project that aims to improve the current way of living the space through the experience of water.

- 1a. How the contact with water can be improved in the "stay" areas?
- 1b. How the canopy could be involved in the reconnection with water?
2. How the interaction with water can be inserted in the transition areas?
3. How the use of the "exterior" areas can be improved?
4. Does the current walk nearby the river provide the best dynamic experience of the water?

Figure 105. Spatial insights  
Source: The Author

## 4.4 CONCLUSIONS

The evaluation of all the data collected thanks to the *SWOT analysis* and the use of *radial graphs* led to the elaboration of possible directions to adopt in the project.

In particular, thanks to the SWOT analysis resulted possible to underline the strengths, understand how to take advantages of the opportunities and be aware of the weakness and threats so as to not underestimate them, as showed in the figure below.

<p><b>The position and the previous use make the platform a symbol of Shanghai's development</b></p> <p><b>It is disconnected from the stressful environment of the city</b></p> <p>It is a viewing point on significative Shanghai's landmarks</p> <p><b>It is surrounded by water</b></p>	<p><b>S</b></p> <hr/> <p><b>O</b></p>	<p><b>The relation between water and people is mainly visive and static</b></p> <p>The architecture doesn't valorise the presence of the water</p> <p>The architecture characterizes the platform strongly</p> <p>The architecture at night "disappears"</p>	<p><b>W</b></p> <hr/> <p><b>T</b></p>
<p><b>The environment around is always changing</b></p> <p>Water around is never static</p> <p>The park around is a living system</p> <p>It is popular among the neighborhood</p> <p>The park is open 24 h</p>		<p><b>Weather conditions influence the presence of people</b></p> <p>People do not go to the park at night</p> <p><b>Huangpu river water is polluted and not suitable for a safe contact</b></p>	

SWOT analysis of the current state of Lu di platform  
Source: The Author

For what concerns the radial graphs, the Author applied the same used for evaluating the cases study in the Chapter 3 so as to understand the general position of the current situation of the site according to the same variables, focusing in particular, on the ones that resulted weak such as the genius loci, the interaction with water and the reproducibility of the project. (radial graph a)

Once the position of the current state of the platform was clear resulted useful to compare it with the aims of the project so as to understand which could be the main points to work on and also to compare it, at the end of the study, with what has been achieved. (radial graph b)

In particular, what is evidence from the comparison between the two graphs is the attempt of strengthen each point with a focus on the interaction and a new experience of water, reproducible in other contexts or areas, today almost absent on the site.



Radar charts showing the current state (a) and the possible future situation (b) of the platform  
Source: The Author

# 5 THE PROJECT

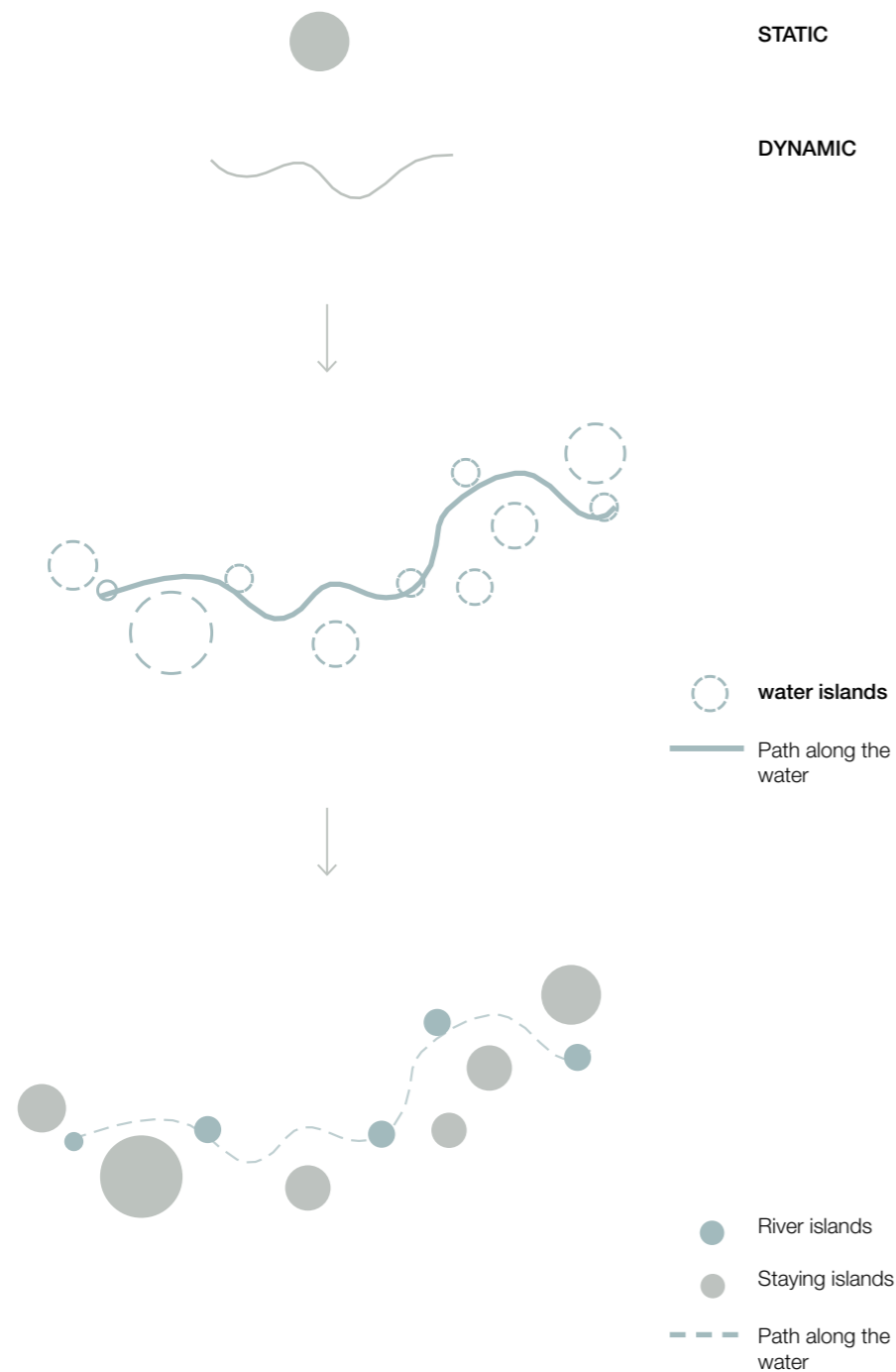
The design project is the result of a succession of different phases starting with the ideation of a concept based on the whole information collected during the research. The phase one constitutes an initial development of what pointed out during the ideation, later validate and implemented thanks to a co-design session where the users have been further involved in the design process. The second phase represents the final development of the idea and includes considerations on future or different applications of the project in the same or similar contexts.

## 5.1 CONCEPT IDEATION

The way in which people live the riverfront in Shanghai, both dynamically and statically, walking along it looking for a spot to stop and spend some time, and the historical value of the waterways in the city as a means to move along the water have inspired the ideation of this project. The idea is to create a space where people physically and metaphorically follow the water and find a spot where they can spend some time and perform the activities they already do on the riverfront. The tendency of Shanghai's inhabitants, analysed especially on Lu di Platform, to consider the waterfront as a pathway and at the same time as a recreational space made it possible to imagine each stop as a water island, a place where people stay nearby water. Here the natural element is protagonist and people can experience it in a dynamic way, in activities that belong to their daily life.

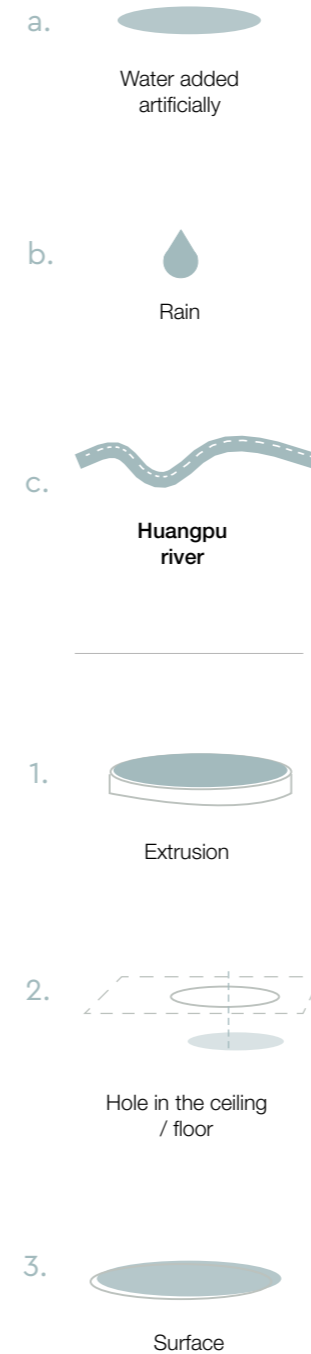
### **A path along the water**

The idea is to create a free path along the water that metaphorically represents the one of the River and that gives people the possibility to stop in different water islands, where each one explores a different aspect of the natural element and provides a different experience of it. So as not to keep, conceptually and visually, the path disconnected from the stops it is designed as a sum of water islands that guide the movement so creating a distinction between the "staying islands", the ones where people stop and stay longer, and the "River islands", the ones that create a path to follow and that metaphorically reconnect users to the River where the period of staying is meant to be shorter. In this way, the dynamic movement on the platform and the static activities are integrated and all connected by water.



Diagrams showing the concept generation  
Source: The Author

**Different typologies of water**



The overall result is the transformation of the site in a "blue space", a volume surrounded by water, where the natural element touches all the surfaces and enters in direct contact with the users. The water is in, on or above the islands; the three positions of it also determines the involvement of three different kinds of water, two from the environment, rather, the water of the Huangpu River and the rain and one added artificially in the water feature designed.

According to the method used in analysing the case studies in Chapter three, in this phase, categories of architectural typologies have been used in order to understand how water could be added to each "island" and, as a consequence, which could be the relation between them and water.

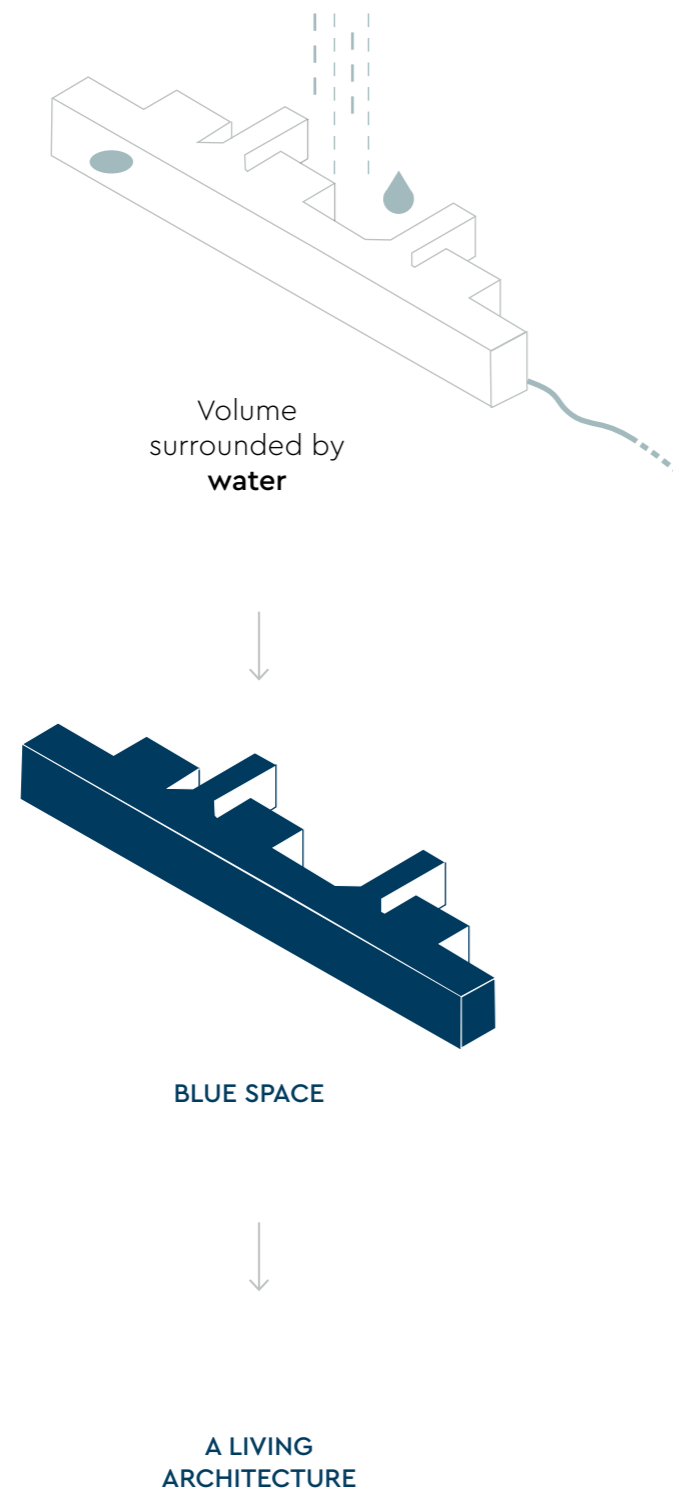
The result are three different typologies of interventions, extrusion and so water tanks, addition and subtraction of surfaces such as patterns and holes both possible on the canopy or on the floor.

The decision of involving not only the water coming from the river but also the one from the environment and partially adding a new one, artificially, stands on the necessity of solving some practical problems mainly related to users' safety: as widely explained in the research, the pollution of the Huangpu River does not guarantee a safe contact with it. On the other side, the idea of involving the rain as a source of water comes from the awareness of being in front of an urban project where the weather conditions cannot be not considered at all. What is more, rain, because of the phenomenon of the rainy season, strictly related to the genius loci of the city, characterizes the Huangpu River and the behaviour of people deeply. Using it as a key element of the projects opens the possibility of making it seen as a special event rather than an obstacle and tempts people to use the space despite the weather conditions.

The involvement of the surrounding in terms of water and so the Huangpu River and the rain implies, as a consequence, that the architecture is alive: as already pointed out, the presence of living water in a space makes it living too. For this reason, the design takes in consideration the change that will occur according to the environment due to the weather conditions, the exposition to many water sources and the time passing, trying to control, as much as possible, the not constancy of the natural element.

General study of the architectural and water typologies involved in the project.  
Source: The Author





Overview of the value added to the site through the intervention.  
Source: The Author

### 5.1.1 Spatial layout

The general layout is the result of the application of the concept to the site, and so the individuation of an area where people could walk and some static spots. The layout comes directly from the insights obtained during the behavioural mapping and, of course, the architecture. Thanks to the elaboration of the information collected it was possible to nail down the areas where the staying islands could be located and, above all, some more detailed aspects about them.

In general, the layout follows the pre-existing shape of the platform and tends to assign similar functions to the spaces that are visibly the same in plan and that occupy the same number of squared metres.

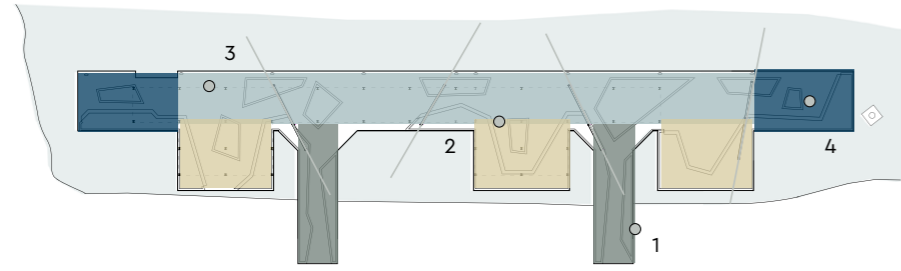
In particular, for the "staying islands" it resulted important to create a subdivision between "private areas" and "gathering areas" according to people's behaviour. They have been positioned in the space taking advantage of the architecture itself: the areas intended for a more private staying are located in the most isolated points of the platform, the ones for gathering are placed where people already gather thanks to the current configuration. What is more, in order to keep the connection between the platform and the whole park, today obtained mainly thanks to the green islands spread on the site, some of them have been kept, intending them as connectors between the "inside", the platform, and the "outside", the park, and as those "water islands" where the water naturally shows up its power of making plants growing.

The central corridor currently mainly used for a dynamic movement is kept as a path along the River, where the "River islands" are placed.

In all of them a direct visual access to the Huangpu River is guaranteed and a more dynamic and more sensorial contact will be added.

Overall, as a result of this layout distribution a development of the concept occurred: different typologies of "staying islands" have been defined, some are more private, others suitable for gathering and, some of them are "green". All of them can be reached following the River, the "River islands". The co-design session later conducted resulted useful to define in a more detailed way some aspects of these areas.

Phases and approach used for the concept development.  
Source: The Author



1



2



3

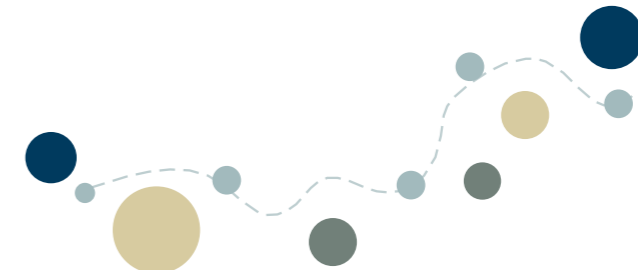
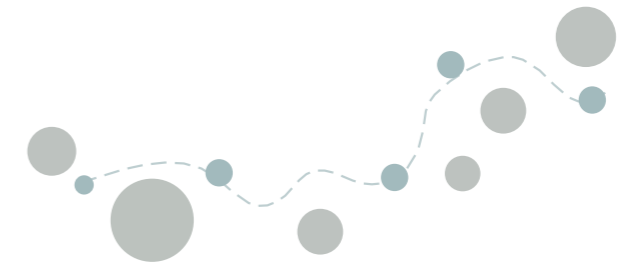
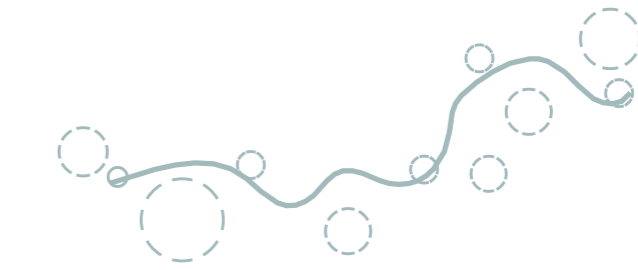


4

- Green islands
- Path along the water

- Private areas
- Gathering areas
- Spot showed in the pictures

New functions distribution based on the pre-existing layout  
Source: The Author



- Green islands
- River islands
- Private islands
- Gathering islands
- Path along the water

New functions distribution based on the pre-existing layout  
Source: The Author

## 5.2 CO-DESIGN

The co-design phase was meant to be in between the concept generation and the development and to be a qualitative rather than a quantitative collection of data, mainly due to the language limitations. It generally aimed to:

The actors of this workshop are the same involved in the field analysis and the future users of the project: the people that are used to spending their recreational time on the platform. For this reason, the location of the co-design session is the platform.

**Validate** the hypothesis made by the Author regarding the spatial layout

**Gain feedbacks** and more ideas about some selected aspects of the project

**Investigate** users' interest in the topic

### 5.2.1 Co-design tools

The workshop was meant to be divided into three steps, each represented by one or a group of touchpoints.

**Step 1:** The attention of people is caught by a boundary object. It consists of a blue circle on the floor with a label on which is a question "Did you know that in the walled city of Shanghai people used to move along the waterways?". Both the elements are related to the project and inspired by the concept.

Two were the main goals of this step:

1. Catch the attention of users trying to make them draw closer to the topic of water in the city of Shanghai.
2. **Prototype** the hypothesis of spreading some "water islands" along the path of the platform and see the reaction of people coming across this new element.

**Step 2:** Once the people stop by the blue shape, they are provided with the activity tools meant to gain feedback and more ideas. Considering the obstacle of the language and the variety of users, a physical booklet where each activity is explained both in Chinese and English, instead of a digital tool, was chosen to interview the users and be sure they could conduct the whole activity despite the impossibility of communicating with the Author.

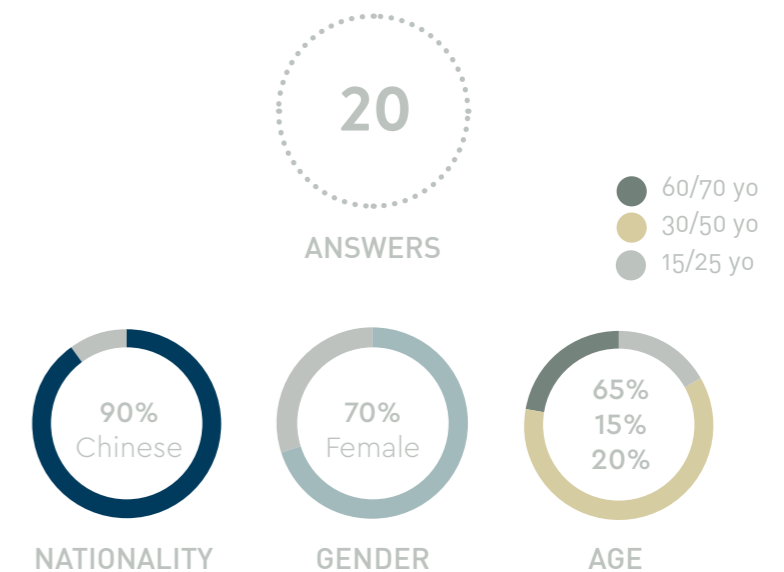
The booklet is composed of a cover page that introduces the project and reconnects people to the first question they came across. A brief explanation of the rules of the activity follows and then a series of multiple choice questions where people can choose their answers through some stickers. A pen is provided in case users express the willingness to add more ideas or write some comments. In order to take advantage of the positive effects that water has on people, and in particular the ability of stimulating creativity, the activity is placed in front of

the water, near the blue circle and people are provided with a sensorial support consisting of earphones to listen to the sound of the Huangpu River during the whole duration of the workshop. The soundtrack, created by the Author collecting different sounds recorded on site in different moments, aims to enhance their creativity, reconnect them to the water through the disconnection with the outside.

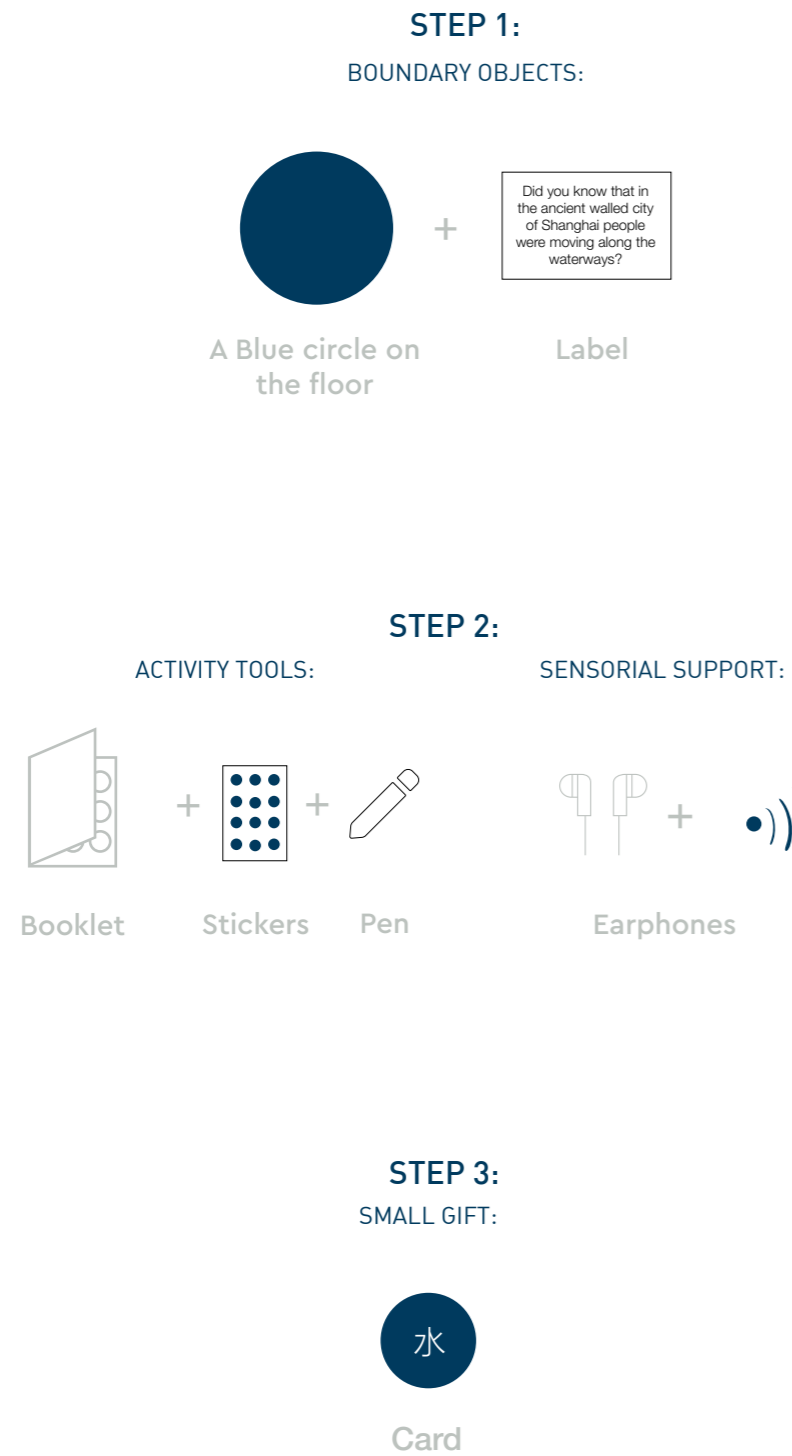
**Step 3:** Once the activity is ended, in the last page of the booklet, together with some general information about the Author, people will find a small gift, a card, blue circle shaped, containing a quote about the water. The aim is to keep the memory of the workshop done and, above all, make people reflect on the natural element, touching their emotional side and providing them suggestions for a reflection on the importance of it for us.

#### Questions

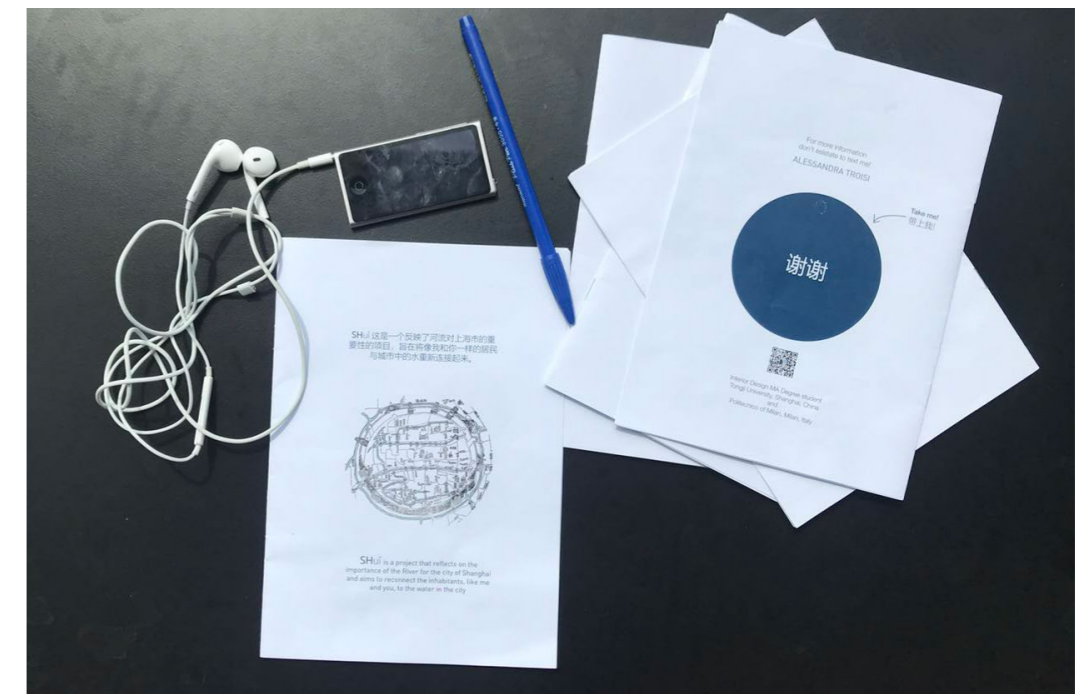
As already explained, the general aim of the questions asked was to have some feedback about some selected aspects of the concept. Looking at them in a deeper way, they can be divided into three sections. The first one, to break the ice about the topic and have a general overview of people's attitude to water, the second one, composed of questions two, three and four, is related to the design of the "staying islands" and aims to make people choose among some possible experiences of water hypothesized by the Author. The last question concerns the design of the "River islands", the goal being to understand which information about the Huangpu River people do not have and which they will be curious to know about so as to enhance the educational aspect of the platform.



Etinographic data about the users of the co-design workshop  
Source: The Author



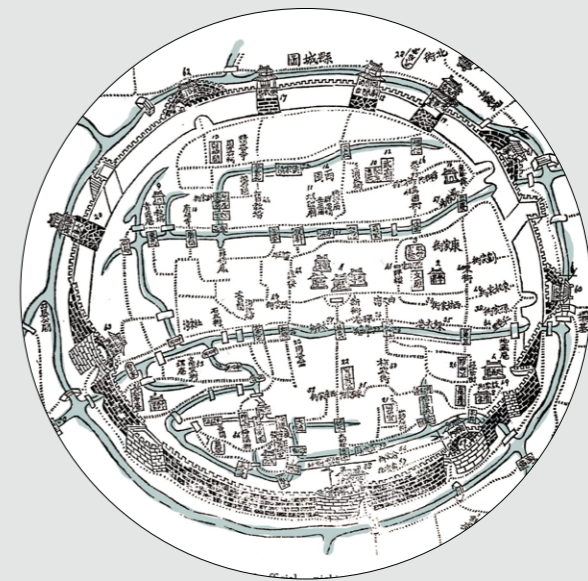
106.



107.

Figure 106, 107. Boundary objects and toolkit co-design workshop  
Source: The Author

SHuǐ 这是一个反映了河流对上海市的重要性的项目，旨在将像我和你一样的居民与城市中的水重新连接起来。



SHUǐ is a project that reflects on the importance of the River for the city of Shanghai and aims to reconnect the inhabitants, like me and you, to the water in the city

Let's start designing  
together the water !

让我们一起来设计水!

- 1** 戴上耳机和  
让水激发你的创造力  
Wear the earphones and  
let the water stimulate your  
*creativity*



- 2** 用圆点标出你的喜好!  
Stick the dots to indicate  
your preference!

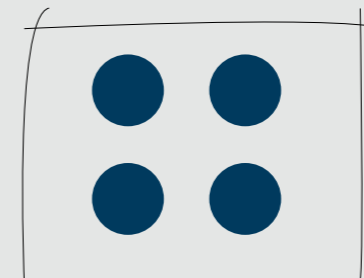
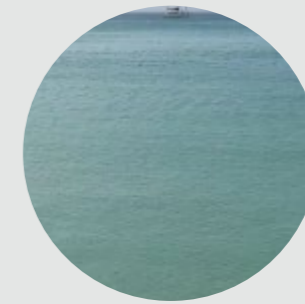
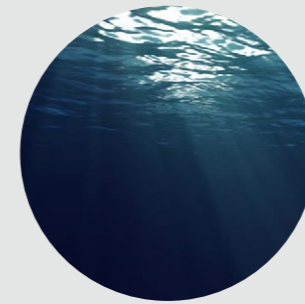
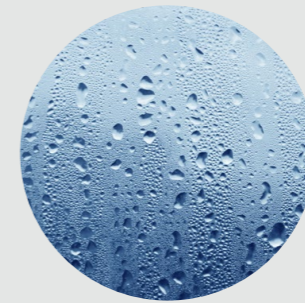
- 3** 请随意表达您的想法!  
Feel free to express your  
ideas!



- 4** 享受!  
ENJOY!

选择你的水...

Choose your water...

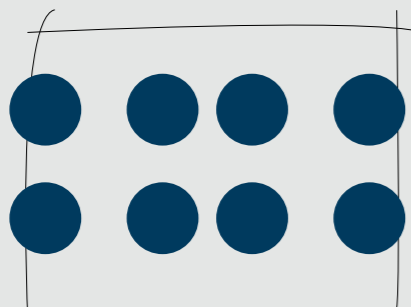


Stick the dots to indicate your  
preference!  
You can choose **only one**

用圆点标出你的喜好!  
您可以选择多个

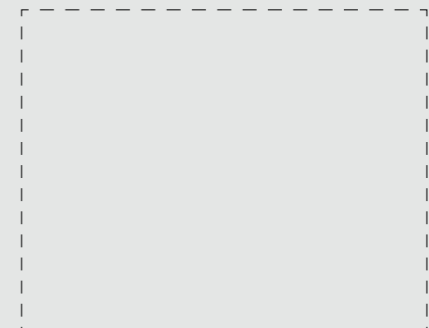
# 你想在河边找到这些水景中的哪一个?

Which one of these water features would you like to find along the riverfront?



Stick the dots to indicate your preference!  
You can choose **more than one**

用圆点标出你的喜好!  
您可以选择多个



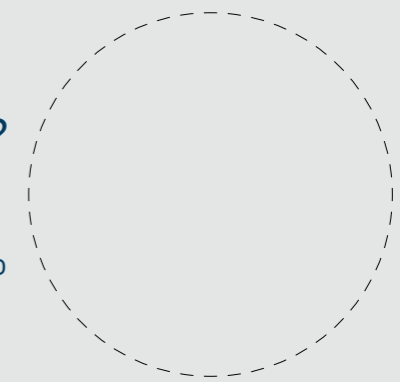
Feel free to write or draw your ideas!

自由地写或写你的想法



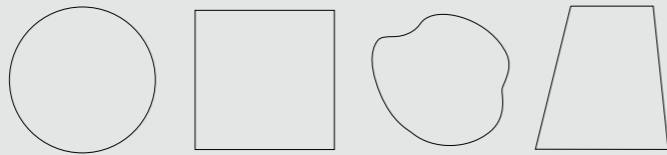
# 你最喜欢在河边做什么活动?

Which activity do you like most to do along the riverfront?

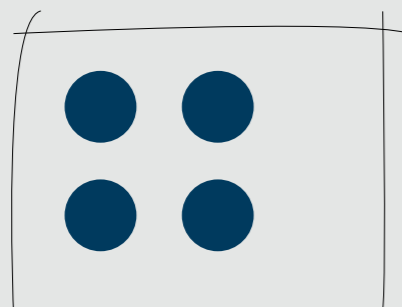


## 你会选择这些图形中的哪一个来装水?

Which of these shapes would you choose to hold water?



Others  
其他



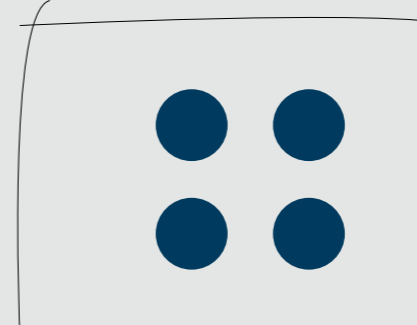
Stick the dots to indicate your preference!  
You can choose **more than one**

用圆点标出你的喜好!  
您可以选择多个

## 你想了解黄浦江的哪些信息?

Which of these information about the Huangpu River would you like to know more about?

- The tide  
潮
- Level of pollution  
污染程度
- The temperature  
温度
- The sound  
声音
- The history of the River  
河流的历史
- The River path  
河道
- Others  
其他



Stick the dots to indicate your preference!  
You can choose **more than one**

用圆点标出你的喜好!  
您可以选择多个



For more information  
don't hesitate to text me!  
ALESSANDRA TROISI

Take me!  
带上我!

谢谢

“ 沿着水面走。  
穿过它的表面。跳进去。  
钻进去。坐在里面。触摸水。  
听我说。触摸水。  
闭上眼睛，喝一大杯。在所有的形状、颜色和形  
状中，更加深深地爱上水。 (...) ”  
你需要水。  
水现在需要你。  
祝你喝水。  
Nichols, Wallace J.



Interior Design MA Degree student  
Tongji University, Shanghai, China  
and  
Politecnico of Milan, Milan, Italy



108.

Figure 108. User taking part in the co-design session  
Source: The Author



108.



110.



109.



111.

Figure 108, 109. Users taking part in the co-design session  
Source: The Author

Figure 110, 111. Users taking part in the co-design session  
Source: The Author

### 5.2.2 Co-design insights

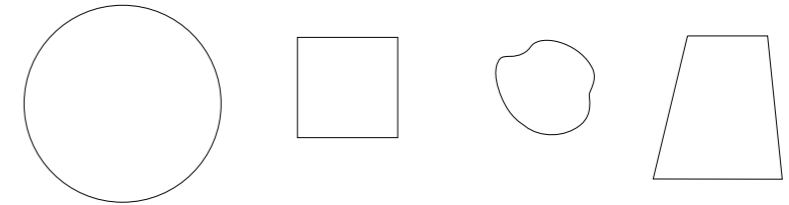
1 Choose your water



2 Which one of these water features would you like to find along the riverfront?



3 Which of these shapes would you choose to hold water?



4 Which of these information about the Huangpu River would you like to know more about?

The temperature 声音	<b>The tide</b> 潮
The sound 声音	<b>The River path</b> 河道
Level of pollution 污染程度	The history of the River 河流的历史

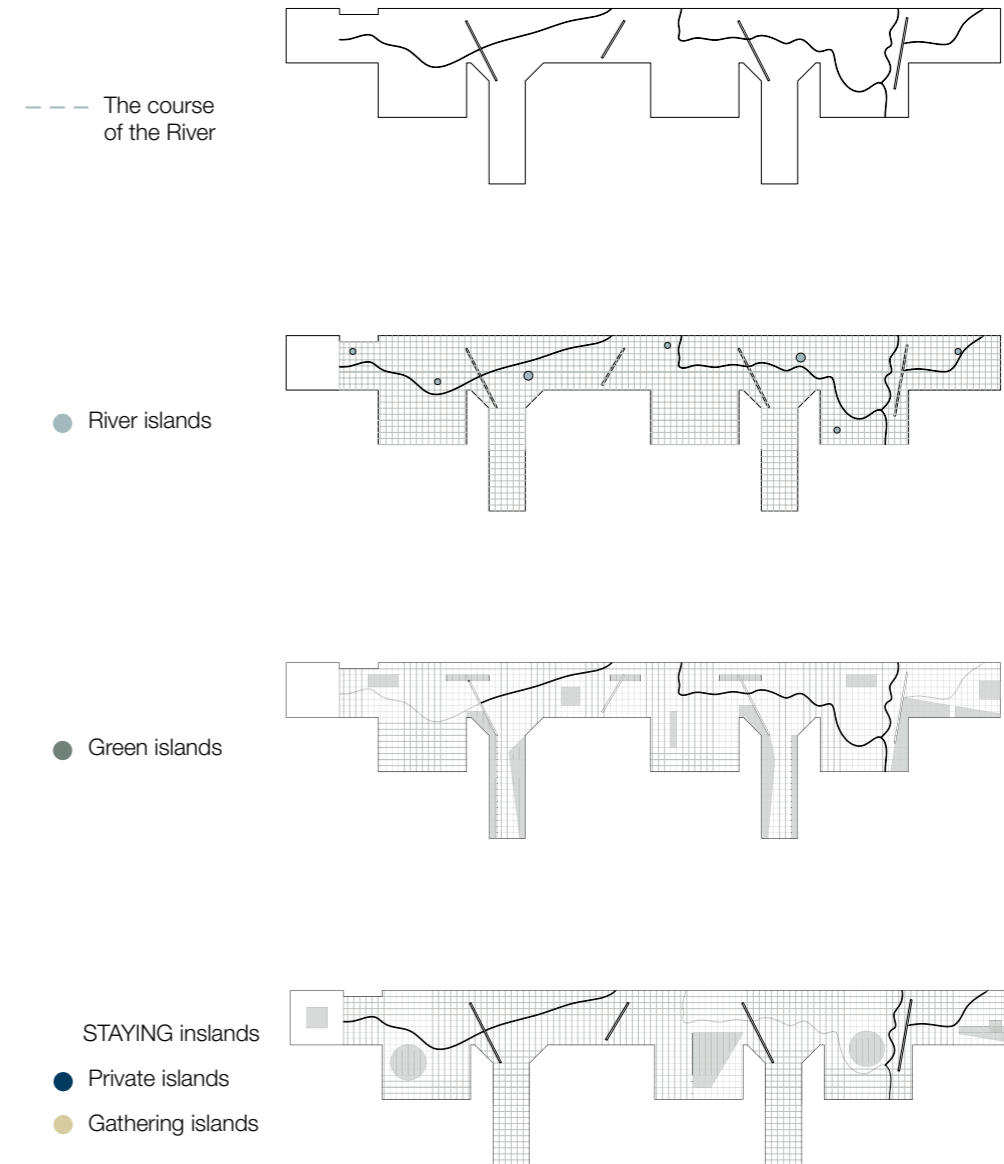
## 5.3 PROJECT DEVELOPMENT

The presence of a path along the water and the different water islands became part of the spatial layout that is composed by **four different layers**.

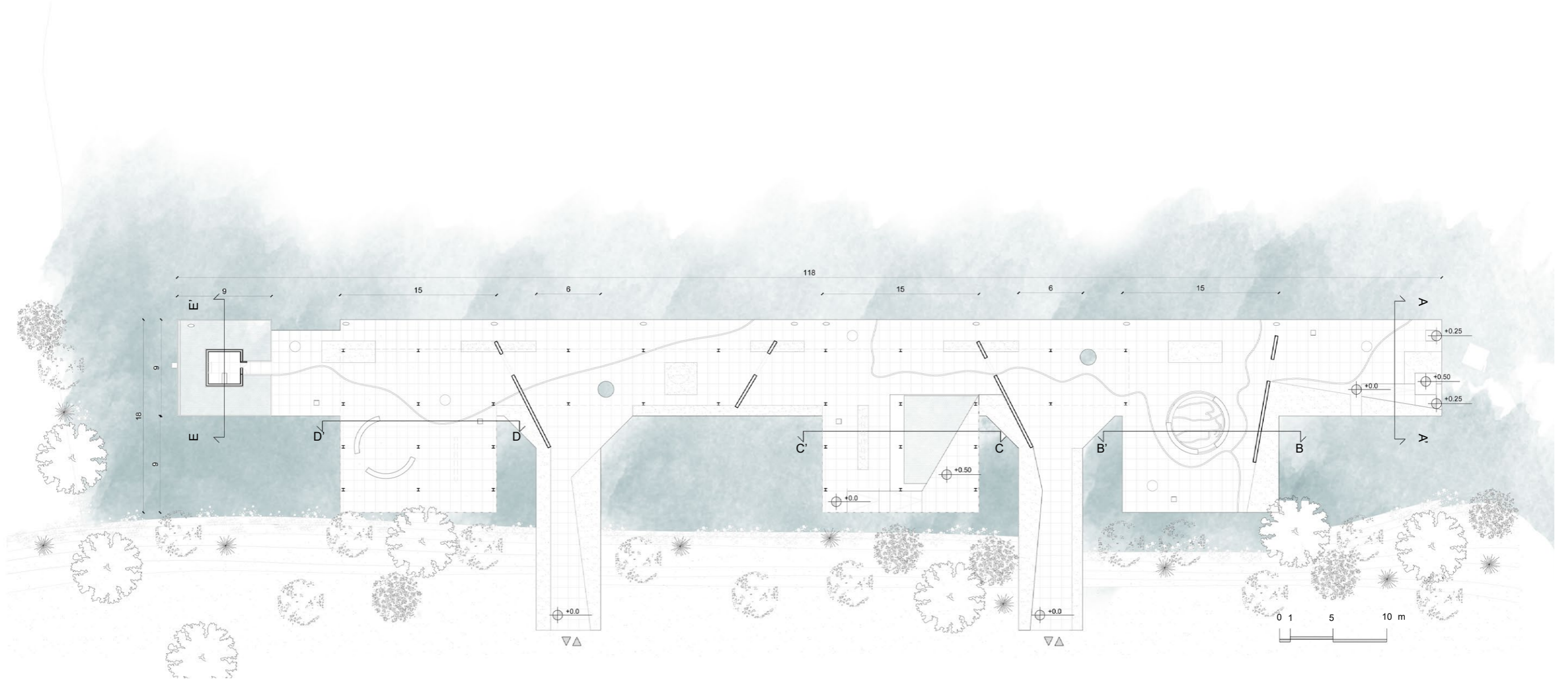
Behind each layer stays a reflection on a different way of designing water and how providing an experience of it. The design of each layer is the result of a selection of findings collected both during the field research and the desk research.

The fact that the final layout is the result of more elements represents a value for the project, demonstrating to be an interior urban design project rather than an urban design intervention that consider the space only in its entirety. In fact, The final layout reflects simultaneously on the big and the small scale enhancing the possibility of being reproduced and spread along the riverfront .

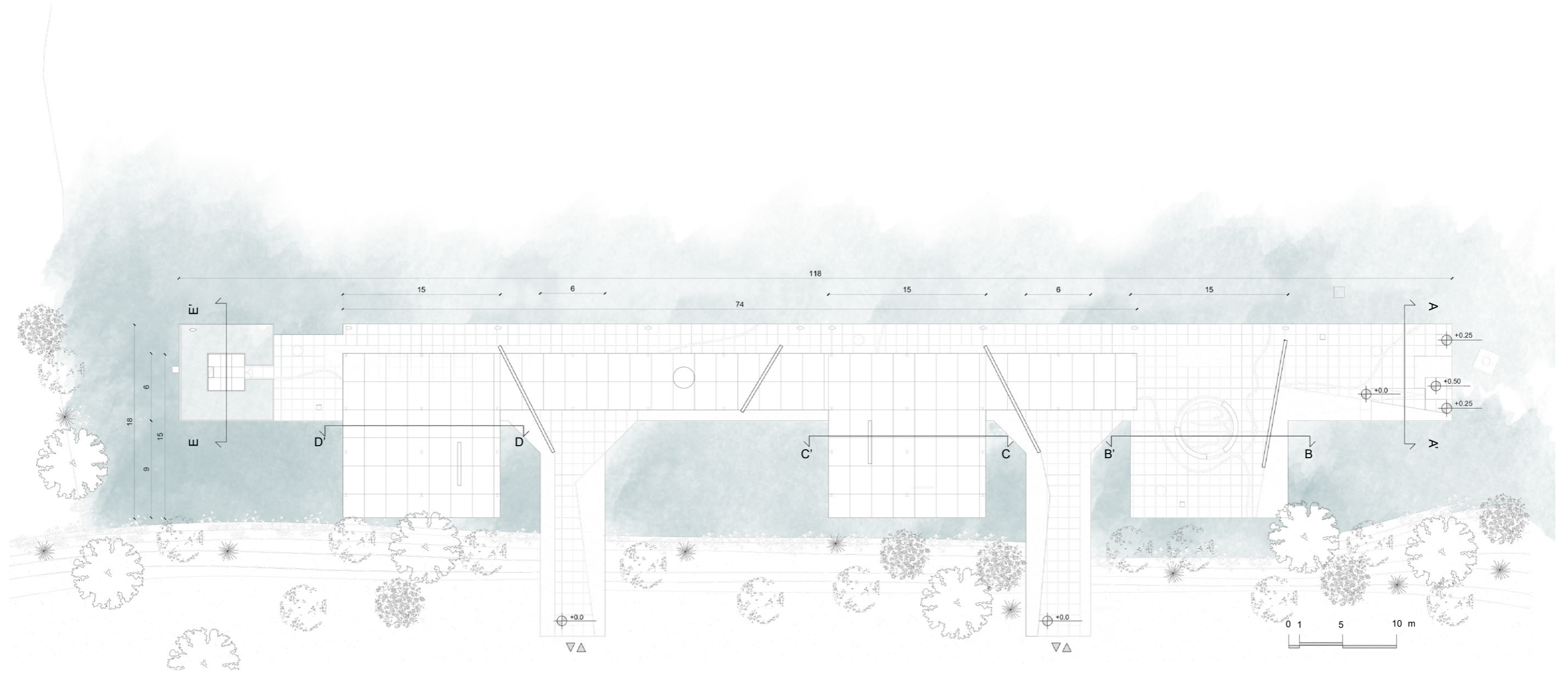
The position and the shape of the different layouts are the results of a match between the preexisting architecture and new elements. In general, the general approach to the pre-existing architecture consisted in eliminating the elements that represented an obstacle for the relation with water, reinterpreting or strengthening the ones that resulted crucial in some users' behaviours and keeping those that make the Lu di Platform a landmark for the park. When adding new objects, a study on how to integrate them with the pre-existing structures was made in terms of architectural components and also the materials. The shape of the platform together with the steel walls constituted a starting point to organise the division of the space. In particular, the location of the staying islands is really connected to the environment that surrounds the platform and to the dimensions of the different areas that today already exists on the platform.



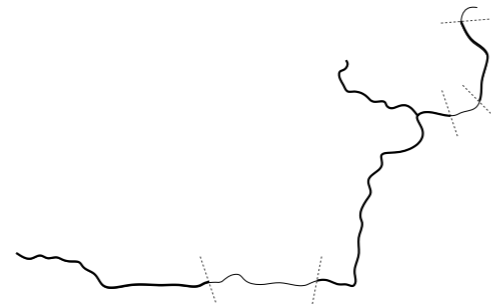
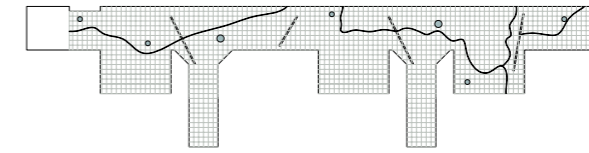
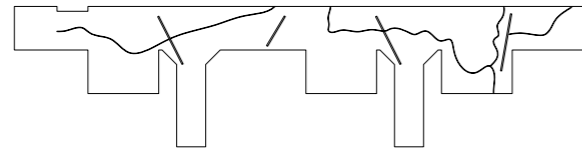
Layers  
Source: The Author



Plan h.120 m  
Source: The Author



Plan h 3.50 m  
Source: The Author



**The course of the River**

The dynamic path along the platform is inspired by the dynamism of the Huangpu River's course, from the Dianshan Lake to the China Sea, crossing both the countryside and the metropolis of Shanghai.

Among all the environments it meets, **Dianfeng, Songpu, Linjiang, Yangpu** and **Wusong** represent five key points of the course. They are meaningful because of their position, their environment and their role in the past and the present, especially in terms of **water pollution**. In fact, at the beginning of the 21st century they were used by the Shanghai Environmental Monitoring Center as **investigation sites** where to register the levels of pollutants in the water and understand the relation between them and environment of the area.

For this reason, according to the co-design session in which the users showed the curiosity in knowing more about the river course and the level of pollution, these five sites became key elements for designing the first layer of the space, the course of the River. The sections of the river course where these sites are located have been isolated, re-drawn and engraved on the floor of the platform so as to provide to people the possibility to discover the curves of the Huangpu River and follow it metaphorically. Looking at the layout from above each segment is connected with the real river under the platform, so the real and the metaphorical water of the river are connected creating both an **experiential** and **educational** contact with the course of the Huangpu River.

**DIANFENG**

The headstream of the Huangpu River. It was used as raw water supply for **drinking purposes** to the city.

**SONGPU**

Upriver outskirts site of **drinking water resources** for Shanghai City

**LINJIANG**

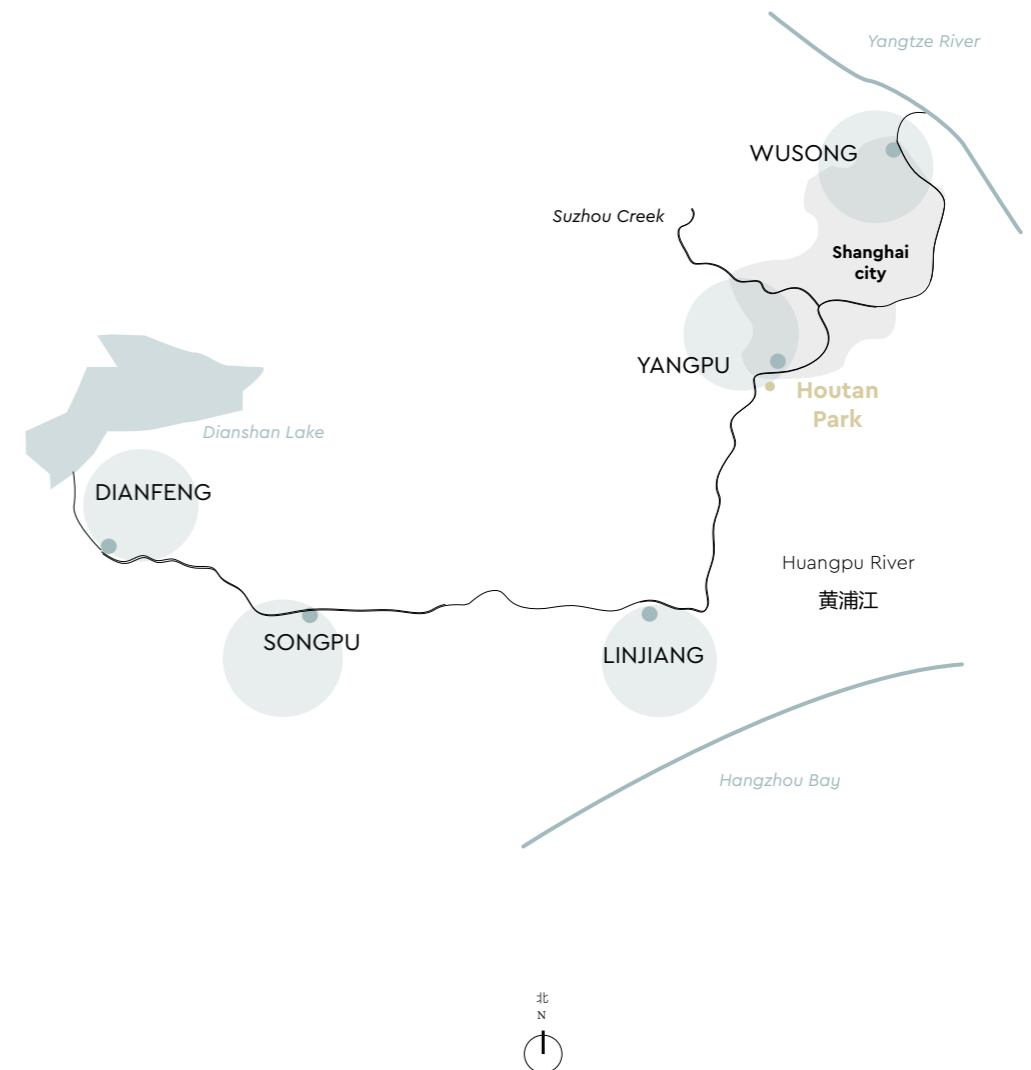
It is located near the famous Jinshan **petrochemical industry** area.

**YANGPU**

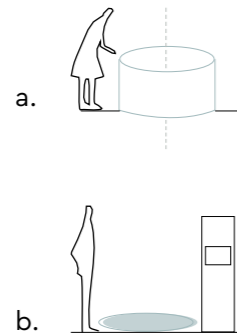
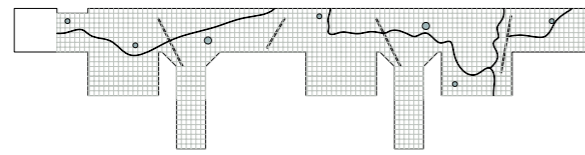
Near the **center of Shanghai City**, in the **old industrial base** of last century.

**WUSONG**

The **estuary** joint with the Yangtze River.



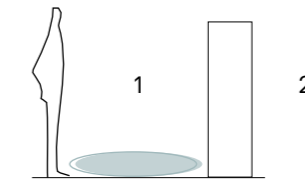
General view of the sampling locations in Huangpu River  
Source: The Author



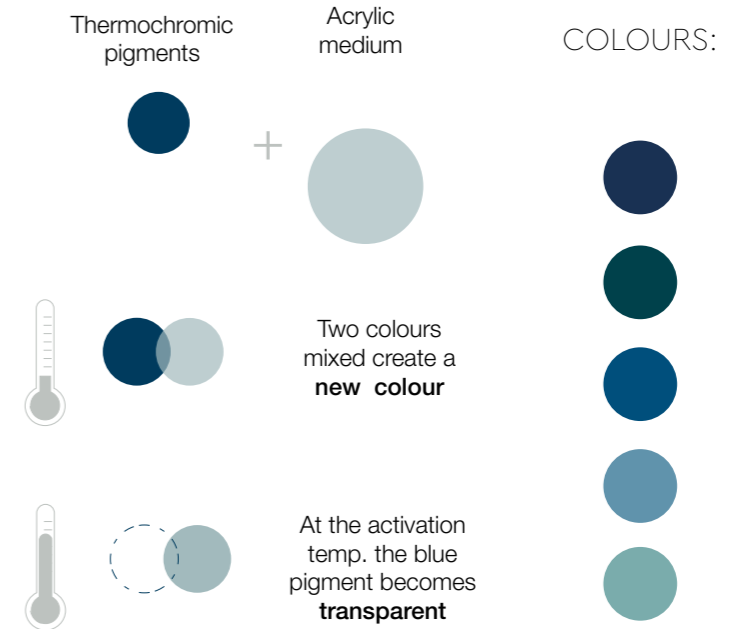
River islands

Following the River path there are some spots, the River islands, intended as brief stops during the dynamic walk along the platform. The purpose of these spots is **educational**: to make users **discover more** about the Huangpu River, in particular about the **tide (a)** and **water pollution (b)**. People can observe the level of water under their feet thanks to two holes through the deck. Simultaneously, they will find along the all path five rounded blue coloured shapes, one for each signivicative spot of the Huangpu River above mentioned. The circles are painted with thermochromic inks generating a temperature-sensitive materials that change color with heat. In this case, once the activation temperature is reached, the area will change colour from a colour to another, in a **reversible** way returning to the original color after cooling. The blue pigments are mixed with other acrylic shades of blue paint so as to guaranteeing both the permanent presence presence of a colour and always five different shades. The surfaces aim to be an eye catching way to incite people in find all the circles, find their own totem, stop by and get more information about that area of the Huangpu River and its level of pollution thanks to a brief text and a qrcode they can scan directly accessing to data obtained by the municipal governative department *Shanghai Enviornmental Monitoring Center (SEMC)*.

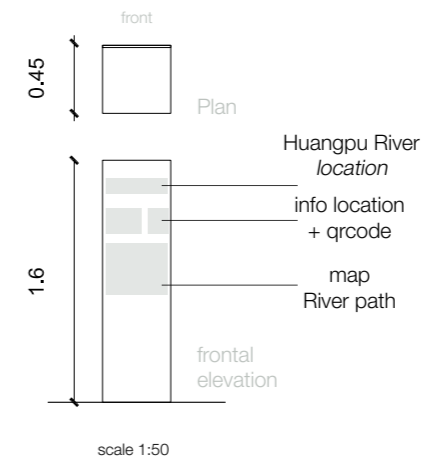
Both the elements are **always changing** according to the surrounding conditions contributing to make the the architecture alive.



1

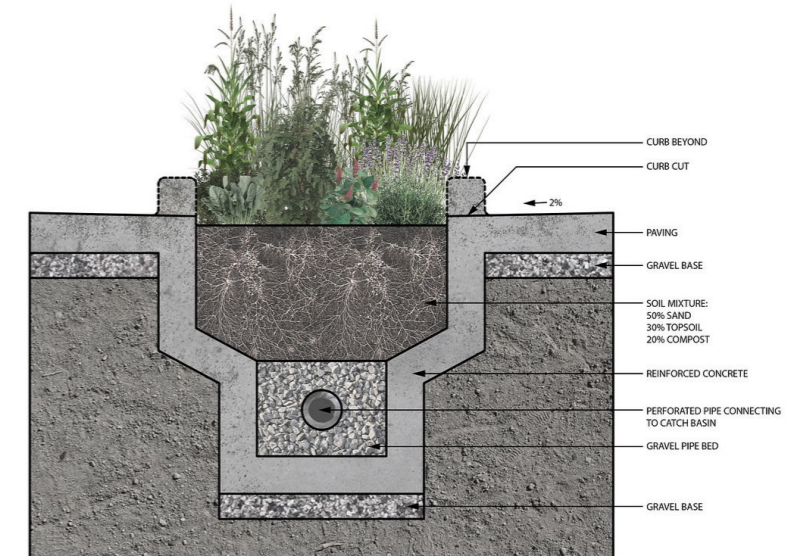
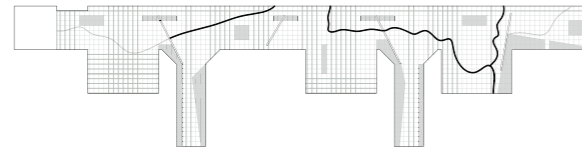


2

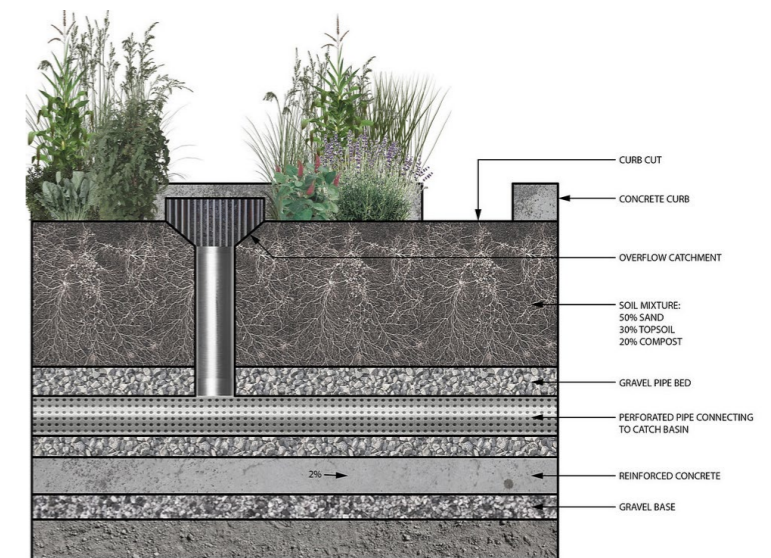


Design of the five water pollution River islands  
Source: The Author





112.



113.

**Green islands**

They have been designed following the principles of the **rain gardens**, a system that capture the stormwater and slow it down; thanks to this technology the stormwater runoff is reduced and stormwater quality is improved.

Rain gardens, as bioswales, tackle the issue of pollution in waterways due to urban runoff by absorbing 30% more stormwater into the ground than a conventional lawn and reduce 70% of surface water pollution that originates from stormwater runoff. They are vegetated with **native plants** that can withstand both heavy watering and drought and engineered with **gravelly soil**, so stormwater is absorbed quickly and deeply. A native plant is any plant that grows locally in an area: they are indigenous to an area and include plants that occur there naturally, have developed in the particular location, or existed for many years in there.

This technology is widely used in landscape design projects in *Sponge Cities* around China, rather urban projects based on water managements strategies.

**TECHNOLOGY:**

Capture stormwater  
Reduce runoff  
Improve water quality

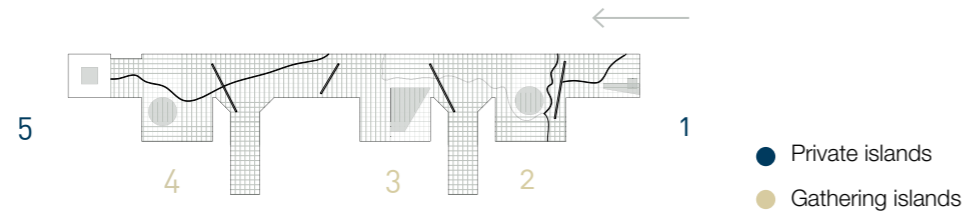
**+30%**  
stormwater absorbed

**-70%**  
surface water pollution

**GREEN:**

Native plants  
gravelly soil

Figure 112, 113. Bioswale cross and long section  
Source: www.symbioticcities.net



Staying islands

The staying islands are those spaces designed to make people stop for a longer time and stay on site, they area meant to host the main activities people already do on the platform involving the River, the rain and the water in general. Some of them are meant to be place for gathering, some others more private, but all of them face the river and reflect on water in different states and shapes providing a different **experience** of it, sometimes also **educational**.

The design of each space follows **four variables** resulted from the study conducted previously on the **restorative power of water**. The **presence of water**, the **experience** of it, in terms of the way in which it generates surprises and puts in front of people water in a different ways from the usual one, the physical **contact** and the **immersion**, intended as disconnection from the outside, define each space. Despite the path is totally free and so a there is not a defined way to move around them and all the users can freely decide where to stay, the positioning of each island is thought and designed. In the centre the maximum grade of presence and contact with water at the liquid state is reached and overall the experience is always high. The only value that increases gradually is the **immersion**, from right to left, from the point where the platform is more exposed to the city to the one where is most surrounded by nature. In both the highest and lowest point, the presence of the water is low but the experience high demonstrating the possibility of designing water not only holding it. The no constancy of the water and the environment around makes all the islands and the experience of them always changing even for the ones who are used to Lu di platform.

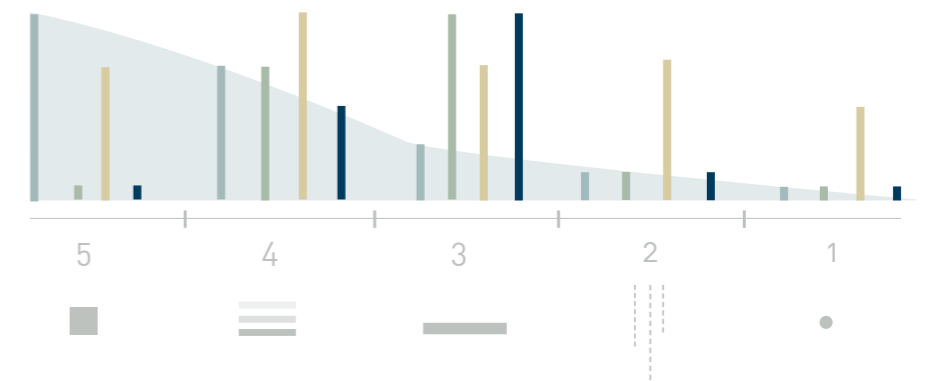
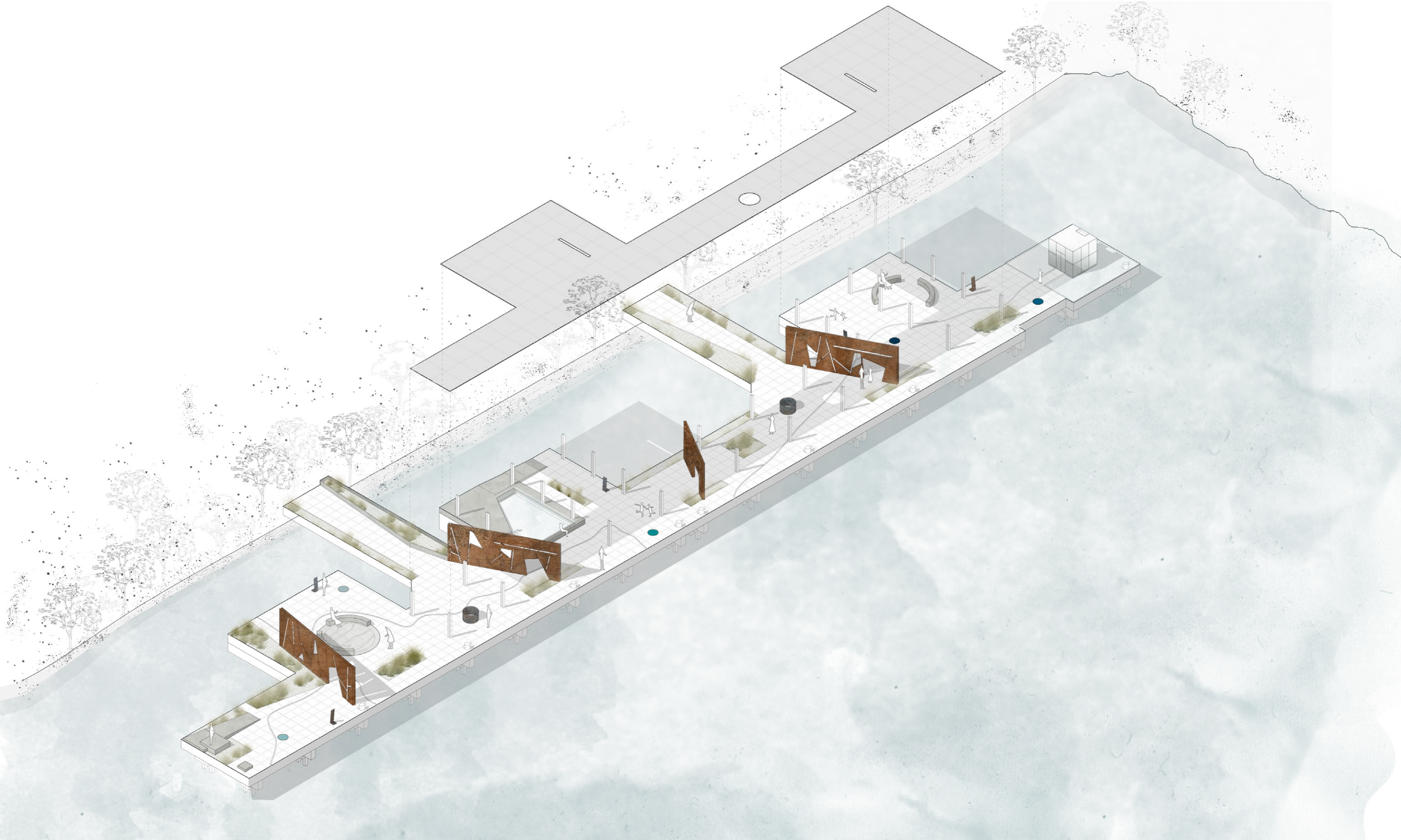
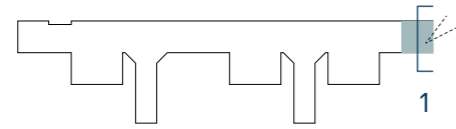
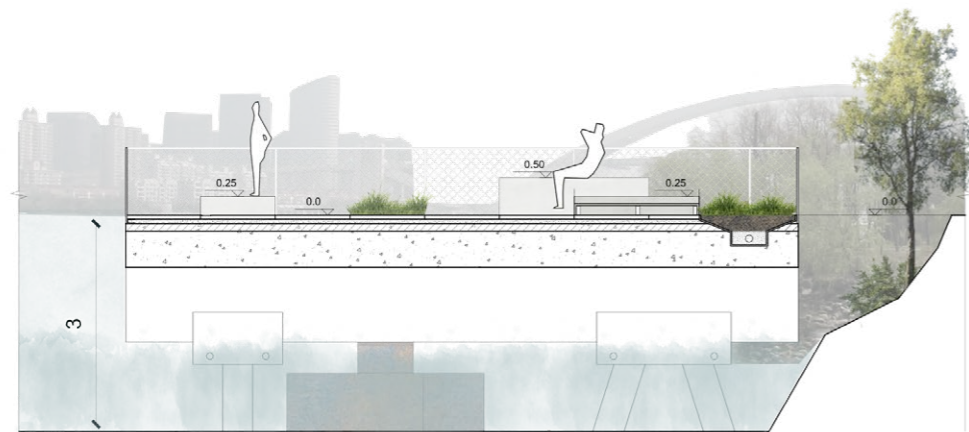


Diagram showing the relation between water and space in each island  
Source: The Author





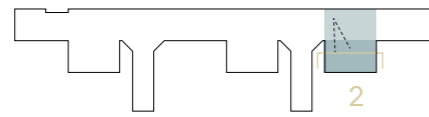
DRY ISLAND



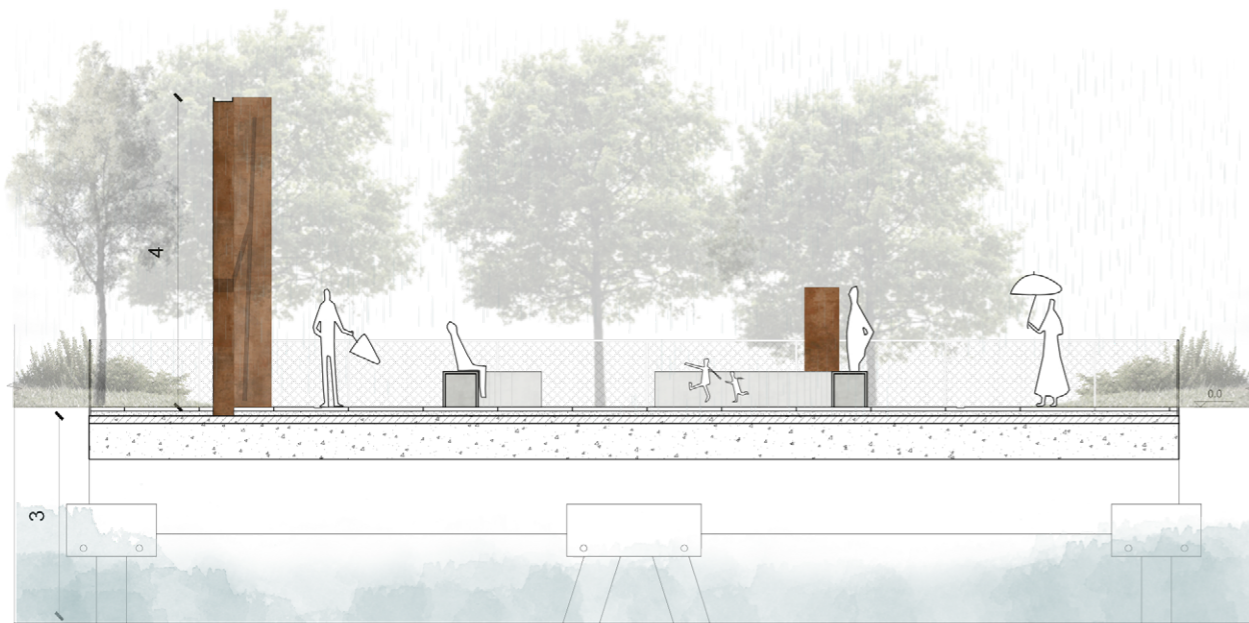
SECTION AA'



The Dry Island [1]: view from the raised base  
Source: The Author



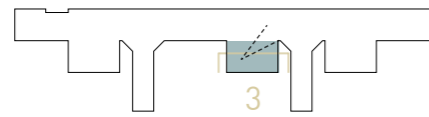
RAINY ISLAND



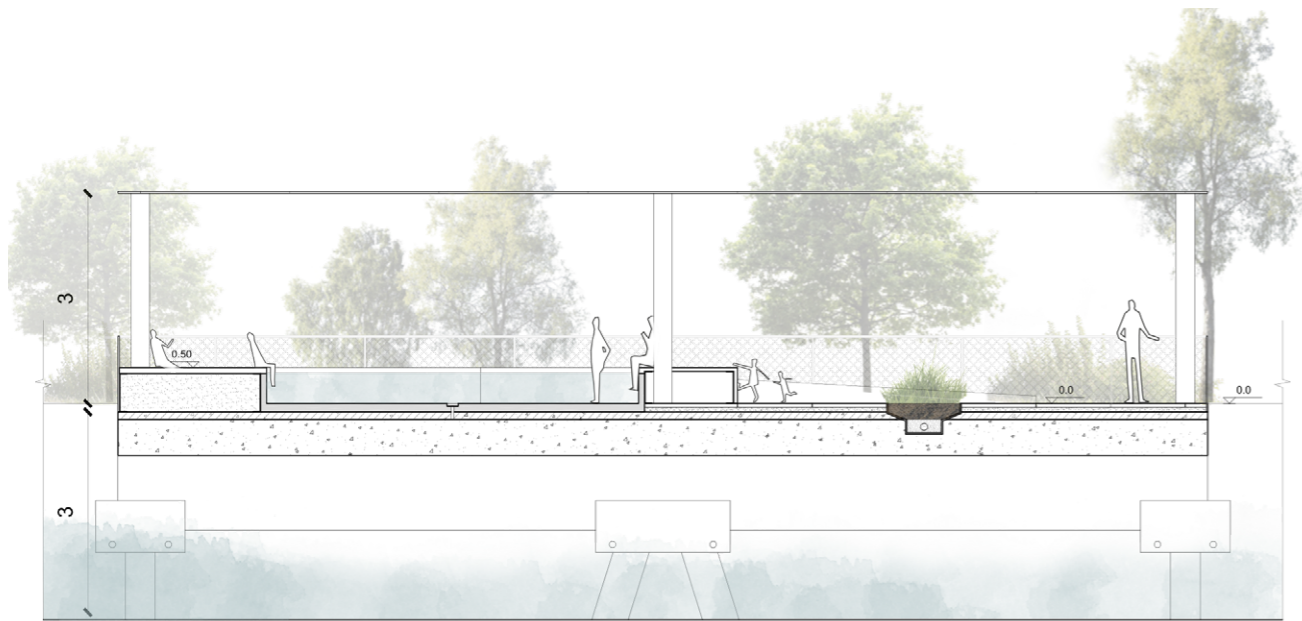
SECTION BB'



The Rainy island [2]: the space in a rainy day  
Source: The Author



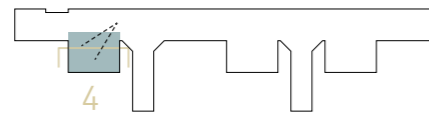
WET ISLAND



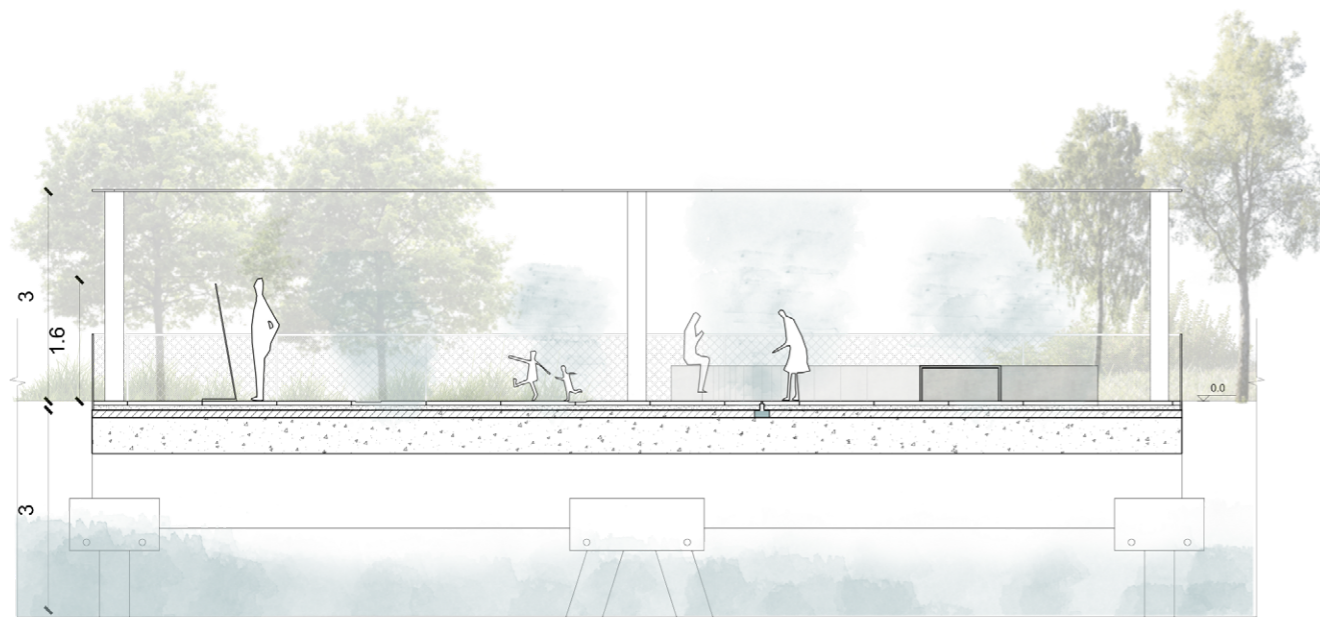
SECTION CC'



The Wet island [3]: foot pool view facing the Huangpu River  
Source: The Author



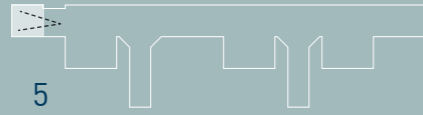
MISTY ISLAND



SECTION DD'



The Misty island [4]: general view of the space when the nebulizers are activated  
Source: The Author



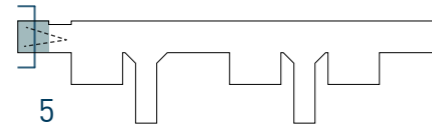
*"Immersion is a kind of  
escape or disconnection  
from the world outside  
the water."*

(Brown, 1997)

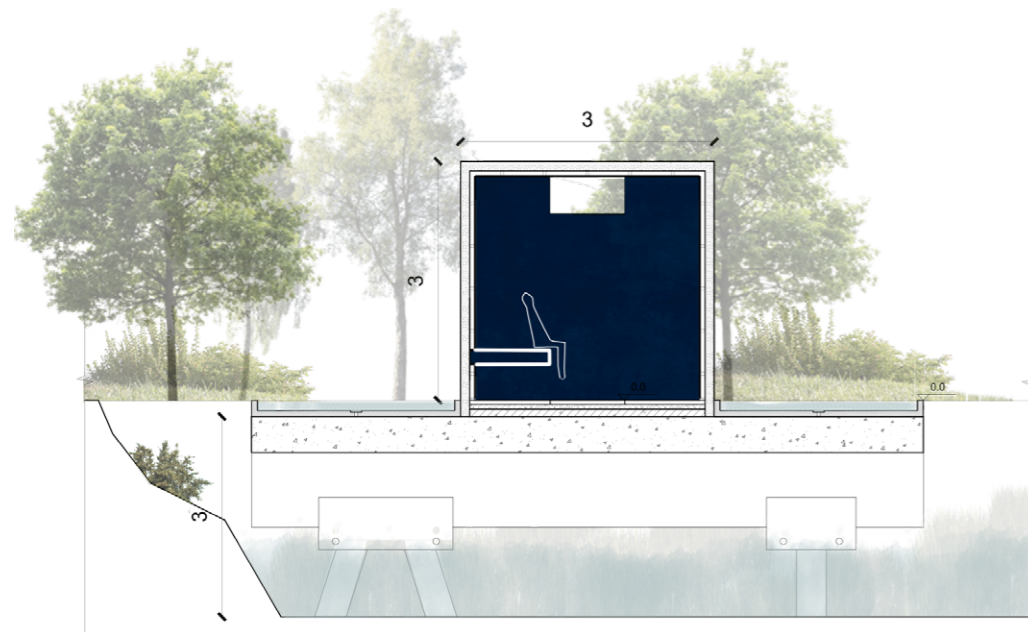


The Blue island [5]: Exterior view  
Source: The Author





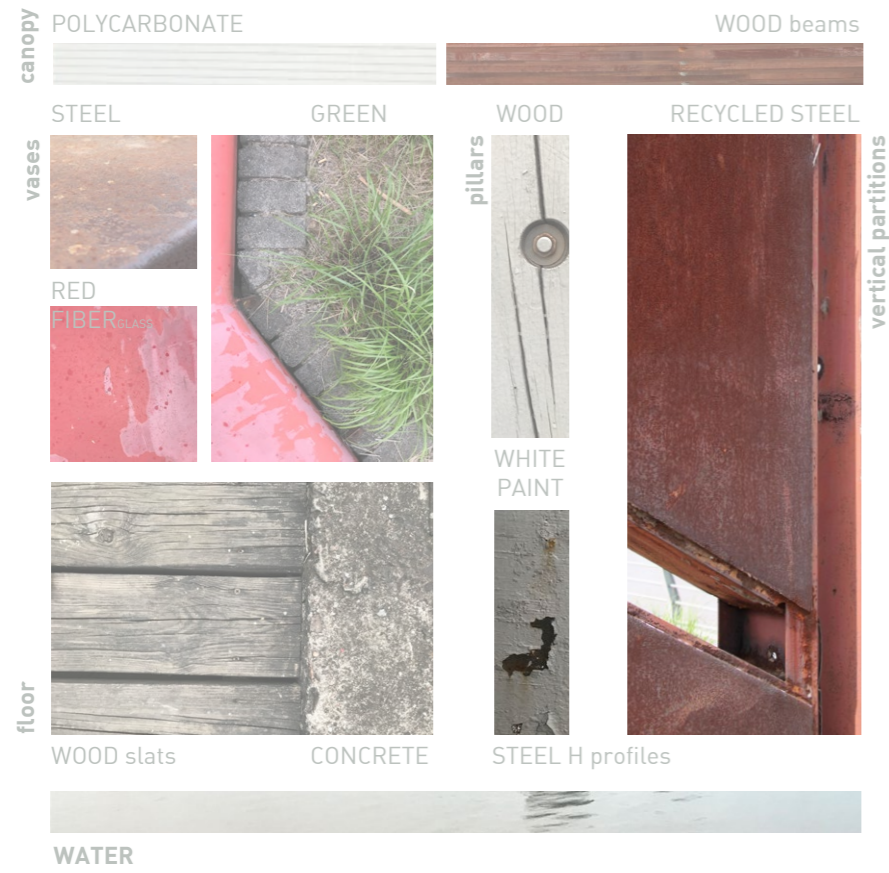
BLUE ISLAND



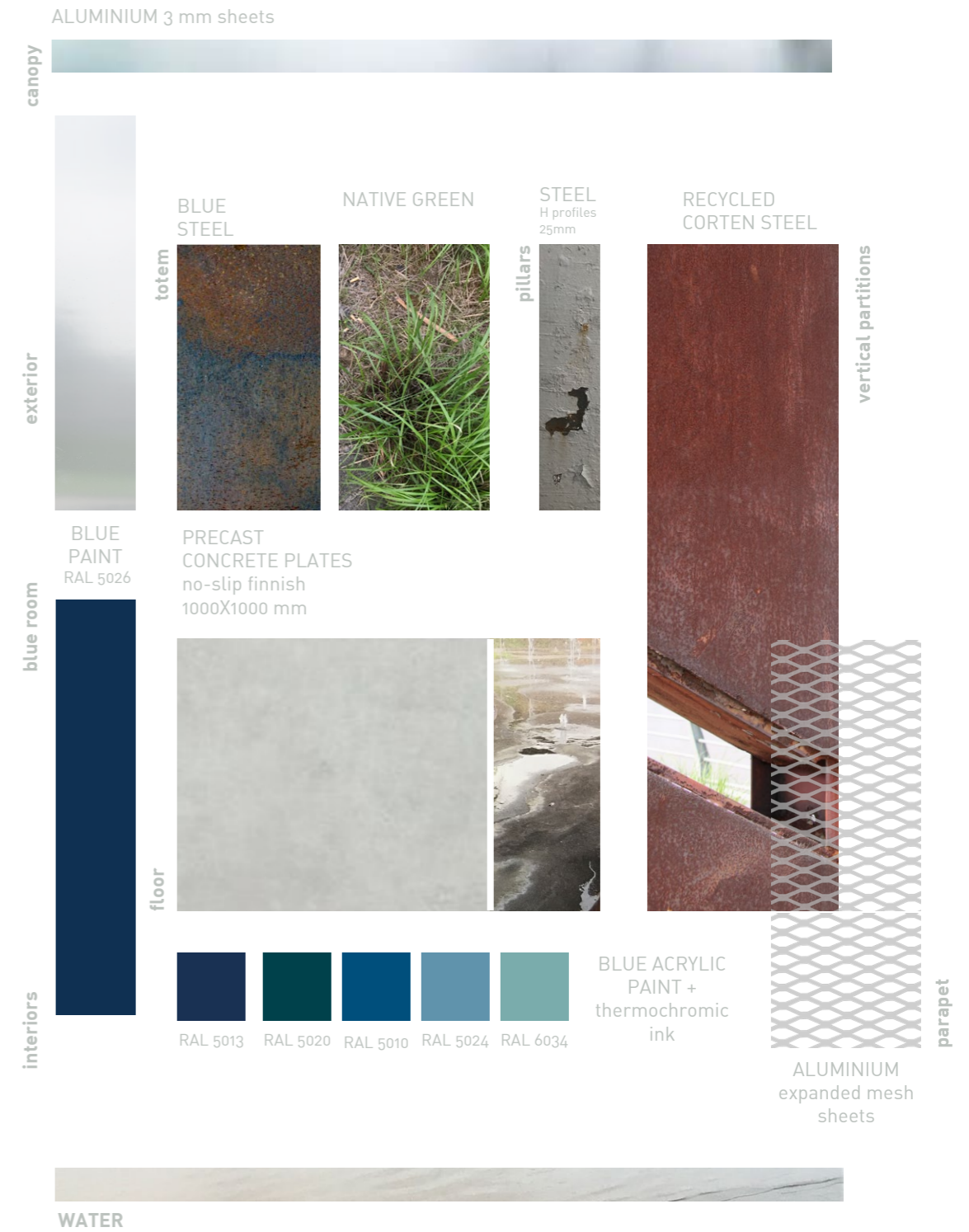
SECTION EE'



The Blue island [5]: Interior view  
Source: The Author



Material board: current materials on site  
Source: The Author



Material board: materials chosen for the project  
Source: The Author

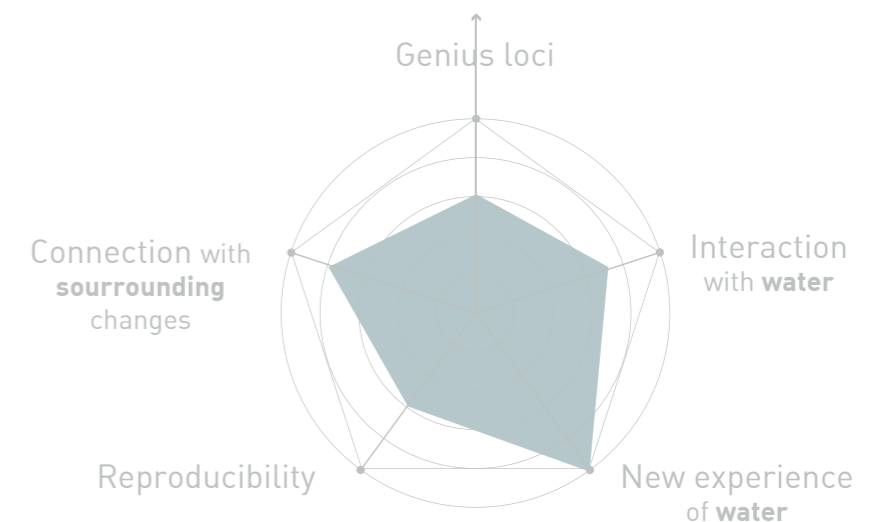
## 5.3 CONCLUSIONS

In conclusion, it can be argued that each of the islands designed is a small permanent installation that participates to the creation of a big "blue space", where different senses are involved as well as different typologies of contacts with water. For each one, one or more architectural objects are designed becoming physical touchpoints of the new relation between water and users. The overall result is a living architecture where the always changing water modifies the aspect and the experience on it.

Sound, touch, sight, smell and taste are all involved in the passage of people on the platform. They led to different grades of physical and metaphorical immersion and so a disconnection to the environment of the city contributing to reach a state of "Blue mind". The disconnection, facilitated by the original position of the site, is enhanced by addition of new water that lowers the noise pollution. The free path along different "islands" guarantees to the users both the possibility of staying or moving, to spend a duration of time in there that is brief, medium or long.

The possibility of being on it alone or with others thanks to the presence of some private and gathering areas follows what came out from the research: recreational activities nearby the water provide a reconnection not only with environment but also with self and the others.

However, looking at the overall evaluation of the project through the radial graphs designed for this study, it is clear that not all the goals established by the Author have been achieved yet totally, especially for what concerns the reproducibility. Overall, the value of this concept stands on the way in which architecture is considered: as a sum of small elements all connected by water and on the fact of approaching the space not from a landscape point of view but with an interior urban design approach. As a consequence, the single areas designed work all together but can also be considered separately as different ways of entering in contact with water exploring one or more aspects of it. For this reason, the reproducibility could be studied in terms of which of these islands could be designed for other parts of the riverfronts, or the city in general, becoming an effective, eye catching water touchpoint.



Radial graph showing the goals achieved in the project  
Source: The Author

## 6 CONCLUSIONS

In conclusion, the study investigates how the presence of water positively affects the human psyche and, in particular, how this happens when the artificial space interacts with the water environment. The research aims to understand how the physiological aspects could be applied in the architecture field, especially in all those cities where the water is a significant symbol of development, as Shanghai surely is.

The conducted historical and urban investigation about the city revealed the crucial role that water, and the Huangpu River in particular, has always been playing from the principle until now. Moreover, the following analysis of realised case studies points out how Shanghai is today facing a new phase through which several industrial areas along the waterfront are renovated in order to return the river to the city's inhabitants, enhancing their quality of life. Nevertheless, application of discoveries on the topic from other fields like medicine, psychology and neuroscience, is still missing in all the analysed design interventions. Additionally, Shanghai's water level and quality are clear reasons why today the contact with this element is not and cannot be imagined as direct. This is true especially when considering the studies about human inclination to clean water, which prove the importance of its clearness in order to reach positive state of mind.

The literature review confirms the value of water for restoration, its positive effects on human behaviours, how and with which intensity it affects human mood, especially in urban environments. Being on, in, around, or near water, as broadly argued by the experts, could calm our overloaded minds, becoming a valid support for the whole research's purpose: to design a publicly accessible space to reconnect inhabitants to the presence of the water in the city. Water in artificial environments attracts people providing a restorative stop where one may reach the "blue mind state", rather calm, peacefulness and happiness; a feeling similar to the one of the immersion, when we are totally disconnected from the exterior world. As a consequence, the "red mind", with all its stress caused by hyper-connected cities, is left outside. Hence, there is an invisible bond that connects water and recreation with the concept of disconnection and reconnection with self, others and the environ-

ment. Despite this, both the research about Shanghai's current urban condition and the cases collected present a lack of application of all this knowledge as part of any kind of interior design project.

Water is a living element and so always changing, never similar to the moment before. To involve water in the spatial design means to create a live architecture where people's senses are always taken in consideration and always in a different way. The final project designed for the Lu di Platform in the Houtan Park exactly represents the attempt to give the city of Shanghai a monument to the water where to discover and experience this fascinating element.

Lu di Platform, a former dock on Shanghai's East riverside, today a viewing platform within the Expo Park, is part of the industrial areas along the riverfront that today are sources of restoration as well as keepers of the memory of the city's old soul. The design intervention re-establishes a connection between Shanghai's inhabitants and the urban environment, in particular with water, through a contact with different typologies of this natural element that characterises the city, such as the rain and river.

It is an urban interior design project, publicly accessible, that reflects on water and all its potentialities and aims to improve and add value to those activities people already choose to do on the riverfront. The intervention is both a sensorial and educational experience since it involves the senses as well as add new knowledge about the water of the city. It is a "blue space", composed by different spots, where each permanent installation leads to reach a different grade of immersion, physical and metaphorical, despite the environment conditions such as rain as well as sound pollution.

Despite the fact of being a site-specific intervention the fact of having been developed through different steps makes easily possible to imagine it as readapted, even partially, in other places along the waterfront or, in the city in general, creating a network of blue spots spread in the urban system.

One of the limits of this study is represented by the language barrier, and the consequential impossibility for the Author to collect a broader number of informal conversations with the future users. Lack of knowledge of the Chinese language in some cases represented a difficulty to connect with peoples' emotional side and hence understand the feelings that move the users in spending their time near the water. These information could further had strengthen the insights already collected through many observation and informal conversation and a co-design session conducted by the Author.

Surely, possible interesting future implementations might be achieved through the organisation of co-creation activities in collaboration with psychologists and ethnographers who can guarantee a more specific collection of insights.

Overall, both the research and the project aim to investigate how architecture, in particular the urban interior design field, can be integrated in the study of water in relation to human behaviours and mind. They represent the starting point for a new urban scenario for Shanghai's waterfront that not only brings people nearer to the water but make them more aware of its value.

The hope is that this study could represents a first, significant step to rise Shanghai's inhabitants awareness of the great source that water is for their city and for all of us as human beings, wishing to all the city's dwellers to spend more time near this fascinating and always changing element and fall in love with it.

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