

**HOW CAN THE RE-DESIGN OF A RIVERSIDE SITE RECONCILE
AN OLD URBAN FABRIC AND NEW COMMUNITY?
THE ADAPTIVE REUSE OF URBAN RIVERSIDE SITE IN HONGKOU DISTRICT, CITY OF
SHANGHAI**

by

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for the degree of Master of Architecture

at

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DEDICATION

For my parents Manjun and Guangping Song, and for my husband Qi Wang.

TABLE OF CONTENTS

ABSTRACT	v
ACKNOWLEDGEMENTS.....	vi
CHAPTER 1: INTRODUCTION.....	1
The Story of Walking Experience in 2008.....	1
CHAPTER 2: BACKGROUND.....	3
2.1 The Story of the Site.....	3
2.2 The Story of the River & its Barriers.....	7
2.3 The Story of Traffic: Chaos on the Road.....	15
2.4 The Story of Public Space & Activities.....	18
2.5 Summary.....	25
CHAPTER 3: DESIGN.....	26
3.1 I Have a Dream.....	26
3.2 Design Concept.....	28
3.3 Design Strategies.....	29
3.3.1 Break up Barriers & Re-organize the Traffic Flow.....	29
3.3.2 Widen the Riverside & Shrink the Vertical Gap.....	32
3.3.3 Physical & Perceptual Connections.....	35
3.3.4 Other Public Spaces.....	40
3.3.5 Design the Path: Texture, Rhythm & Melody.....	46
3.3.6 Designing the Details.....	51
3.3.6.1 Stairs, Ramps & Outdoor Facilities.....	51
3.3.6.2 Paving Materials & Texture	53

3.4 Sustainability Strategies.....	54
3.4.1 Materials.....	54
3.4.1.1 Permeable Concrete Pavement.....	54
3.4.1.2 Drivable Grass®.....	55
3.4.2 Rain Water Collection.....	56
3.4.3 Plants & River Purification.....	56
CHAPTER 4: POLITICAL ENVIRONMENT.....	57
CHAPTER 5: CONCLUSION.....	59
REFERENCES.....	61

ABSTRACT

For hundreds of years, the riverside area of Shanghai was one of the city's most vibrant places, making it an important part of Shanghai's history. By following the story of the rivers, the life and culture of Shanghai's riverside neighbourhoods can be traced. While the river has always been important to the inhabitants of central Shanghai, it has become largely inaccessible during the last several decades. First, the booming manufacturing industries of the 20th century resulted in heavily polluted rivers. Second, physical barriers such as walls and roads were built, preventing access to the rivers. Both of these combine to create a landscape in which urban neighbourhoods are separated from the river as well as from each other. This thesis proposes ways in which a redesign of the riverside can strengthen the culture and community of neighbourhoods while also looking towards the present and future needs of residents and visitors.

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A large portion of my life has been spent in pursuit of finishing my Master of Architecture. The journey extends far beyond the two-year MArch program at Dalhousie University, and therefore, I believe that I have encountered many people along the way who have helped me reach this point in my life. I would like to try to thank at least some of them here.

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CHAPTER 1: INTRODUCTION

The Story of Walking Experience in 2008

In 2008 I was an intern at a design studio located in "Shanghai 1933", a slaughterhouse building in Shanghai's Hongkou district that has been recently re-purposed into a creative hub. Although my office in "Shanghai 1933" was only a twenty minute walk from the subway station, I would always take a deep breath and walk as fast as I could. The old neighbourhood is noisy and messy with many loud and intrusive lights and billboards. Walking through the area made me feel uncomfortable and a little distressed.

There are many obstacles for the pedestrian. I would have to walk around vendors on the cluttered sidewalks, watch overhead for hanging clothes and laundry, and heed and give way to motorcycles and cabs that would suddenly rip around corners and out of alleys. With all this chaos swirling around me I dreamed of having a quiet, clean and safe path so that I could rest my mind and enjoy my walk to work. I knew that the Shajing River meandered through this neighbourhood, but I could not see it because a terribly ugly concrete barrier blocked it from view. While I wanted to see the river water, I resigned myself to believe that perhaps the view and smell of the polluted river might actually make my walk even worse.

As I passed through the doors of the old slaughterhouse, all the chaos was left behind me. At lunch my co-workers would always order food to be delivered to the office because no one was willing to brave the vortex of disorder outside.

Four years have passed since I left Shanghai in 2009, but I still follow the events, and news stories of the communities along the Shajing River. While my experience in the area was not picturesque, I still like the area, and I would like to see it thrive. As an architect, I am constantly thinking about how I can improve the lives of the people who live, work and visit the riverfront neighbourhoods. Although local government planners have tried several strategies in the last few years to make improvements, they have not been very effective, and I think the issues deserve more attention.

By using both theoretical and case studies, I want to propose a new development method for this urban riverfront area based on respect for process orientation, interdisciplinary conditions (such as pollution control, environmental management, urban planning), and provision of multifunctional public spaces. This will be done by redesigning the landscape with a multi-faceted traffic system to connect people to the water and to each other. By using the opportunities provided by the landscape, the addition of infrastructure will aim to bridge the gap between the valuable water area and the community, and ultimately convert the existing lost space into elegant and well used urban public space.

CHAPTER 2: BACKGROUND

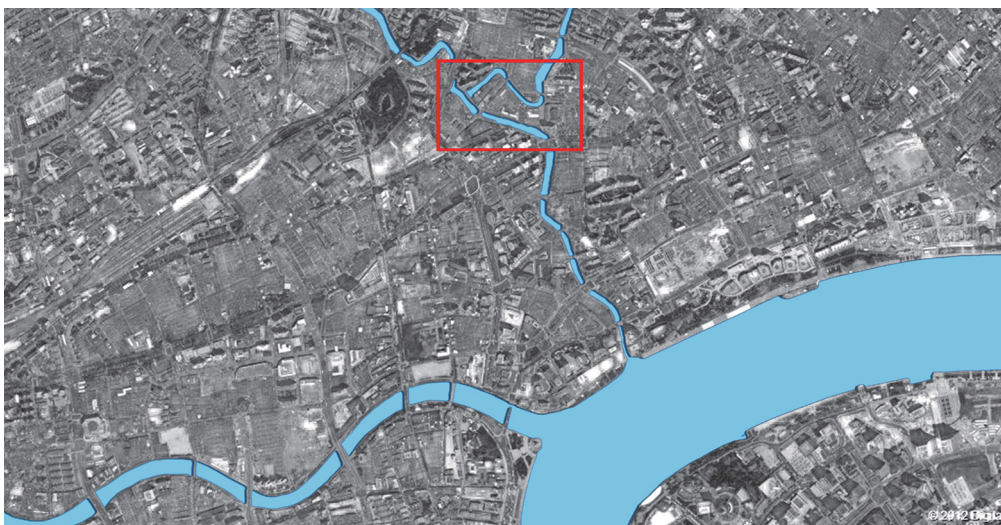
2.1 The Story of the Site



Map of Shanghai, base map from Bing, 2013

Map of Hongkou District, base map from Bing, 2013

The site is located in the Hongkou district, at the edge of downtown Shanghai. It was a historical concession area which was occupied by Britain, France and Japan successively. Businessmen from these countries built factories and warehouses along the river, which made the river a busy inner harbour. It developed a unique and characteristic form of residential community called “Shikumen”, which is a combination of traditional Chinese dwellings and western townhouses. The fish bone structure of laneways provided clean views for British policeman to monitor and control the tenants (Shtong 2014).



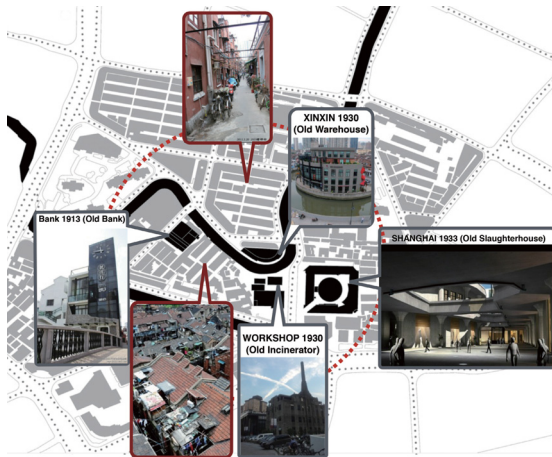
Map of site surrounding by Shajing River, base map from Bing, 2013

Unfortunately, this prosperous area became a battlefield in World War II. Factories closed and the original residents scattered. Entire sections of the site were destroyed by Japanese gunfire and bombs, some traces of which can still be seen today. From 1945-1948, during the Chinese Civil War, groups of refugees entered and camped in this area. Bit by bit, the refugees built shelters and houses, but the area always remained very crowded: even large families would often share a single room. After the founding of the People's Republic of China, the local government reopened the factories and repaired the residential community, but it was powerless to address the overcrowding. The district became one of the poorest and most population-dense areas in Shanghai (Shtong 2014).



Old neighbourhood on site, photograph by Hu Xuefeng, 2010

The old neighbourhood surrounding the Shajing River in the Hongkou district has gained recent attention because several industrial buildings have been repurposed to help turn it into a new creative hub. Fashion shops and design studios have been set up in the old slaughterhouses and warehouses. More and more visitors, vehicles and programs have joined this high-density area, causing a lot of conflict among the different user groups. For example, visitors and users of these re-born buildings complain about the poor and dirty environment, complex traffic conditions and inadequate facilities. Meanwhile, the local community is dissatisfied with the lack of benefits accruing from the fashion hub. Because of all the new users, the amount of public space available to district residents has been markedly reduced. User groups—locals and visitors alike—want solutions. As Ken Greenberg says, "They require some appealing common ground shared by the people who live, work and shop in and visit the area" (Greenberg 2012, 209).



The old neighbourhood and the adaptive reuse of industrial buildings



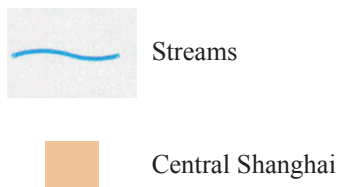
View from site to the central heart of Shanghai

However, in a site where land is at a premium and densities are high, where can we find the "common ground" needed for public recreation? Might the valuable riverfront area be re-opened for public benefit? Can the re-design of a riverside site reconcile an old urban fabric and new community needs at the same time as benefitting and serving all user groups?

I believe the answer is yes.

2.2 The Story of the River & its Barriers

Situated on the delta of the Changjiang River, where it meets the East China Sea, Shanghai has a lot of streams flowing into it. The city was founded as a water town, devoted to trade. The Huangpu River, a tributary of the Changjiang River, bisects Shanghai and feeds the city's many canals.



Streams in Shanghai, base map from Bing, 2013

Chinese people have had a long history of living with rivers: houses were built along the rivers, daily transportation routes relied on river water, food sources were replenished by the rivers, and daily activities such as washing, playing and fishing all involved the river water. Riverside areas were usually the most vibrant spaces in Chinese cities (Hu 2006, 22).



Xitang, a water village nearby Shanghai



Water transportation

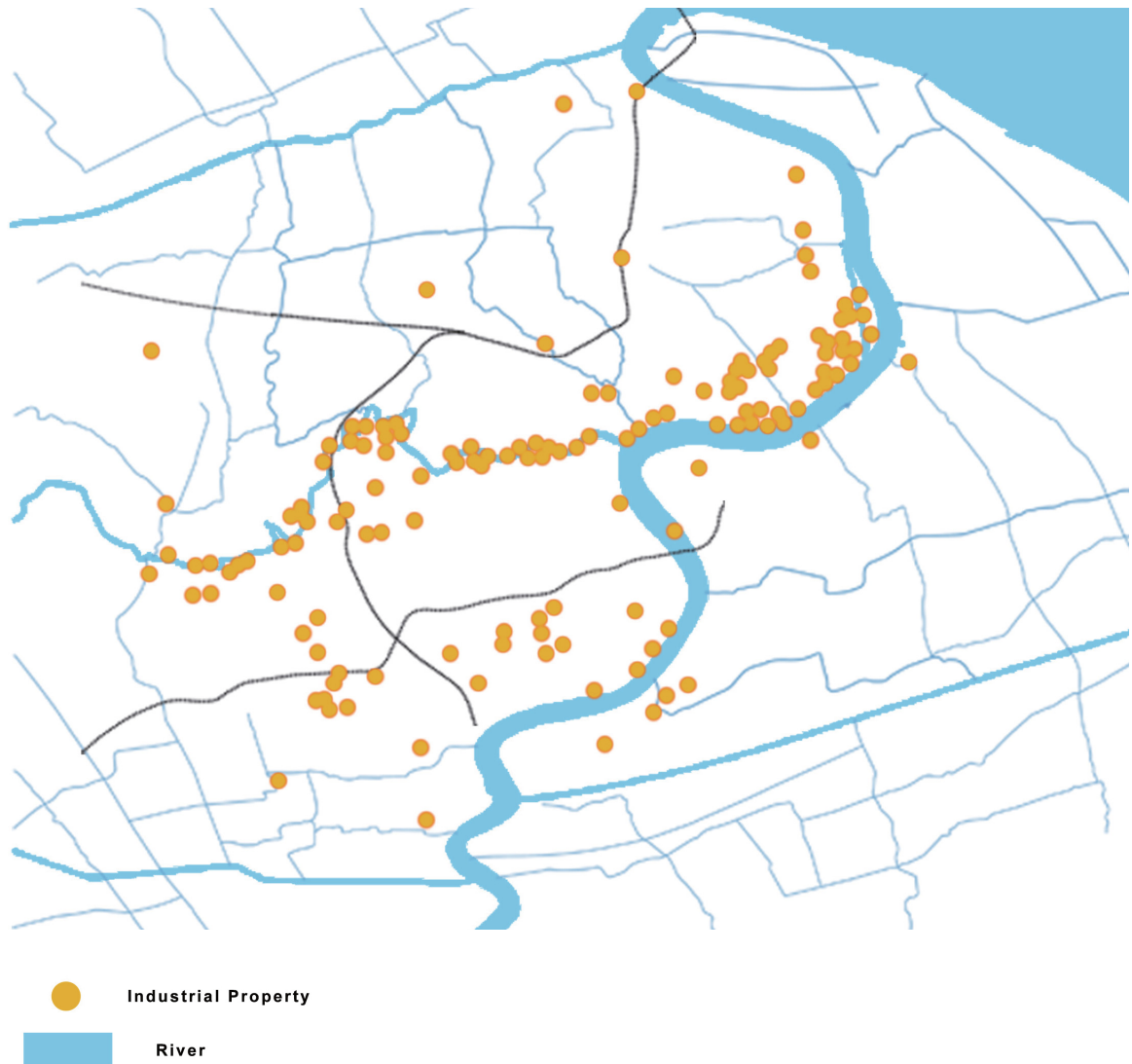


Open river side and footbridge



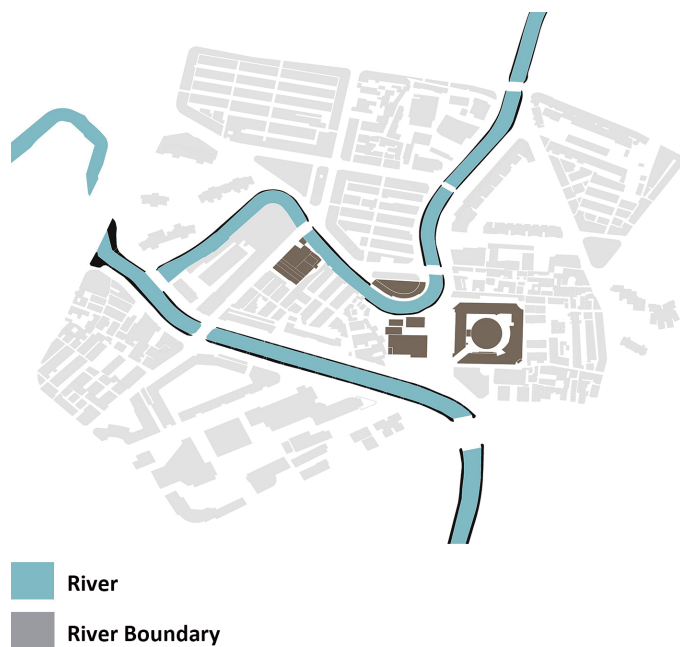
Washing in the river

As noted earlier, businessmen took advantage of the water transportation network and built factories and warehouses along the rivers. These early industries brought economic development to the city, but they also polluted the rivers (Hu 2006, 19).

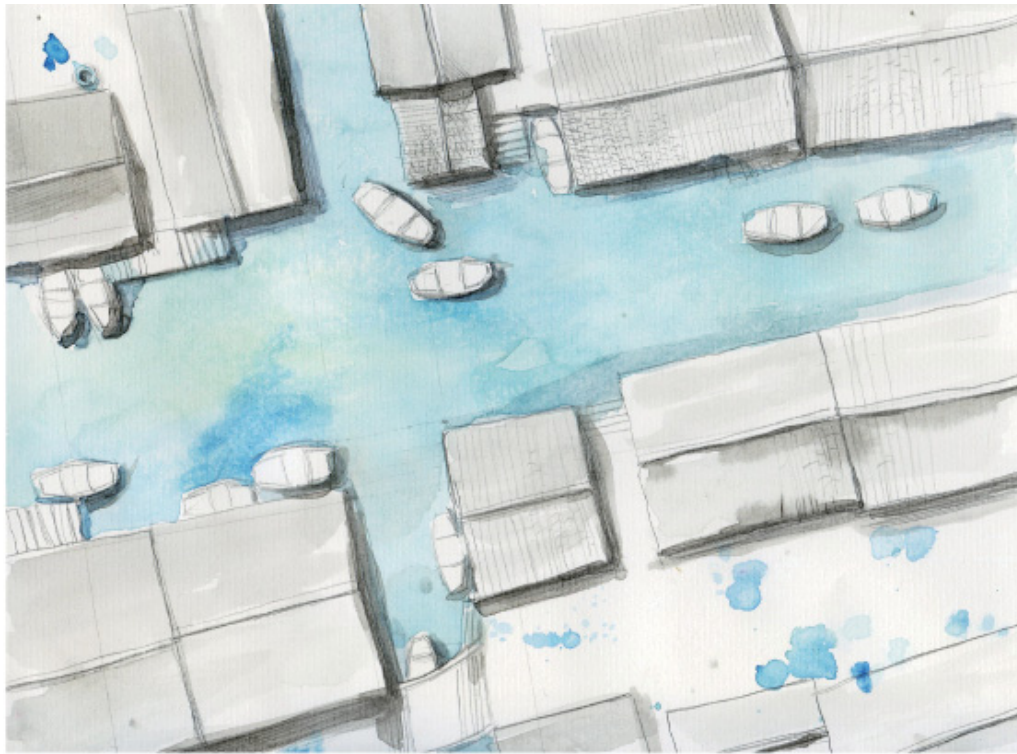


Industrial property along streams, base map from Bing, 2013

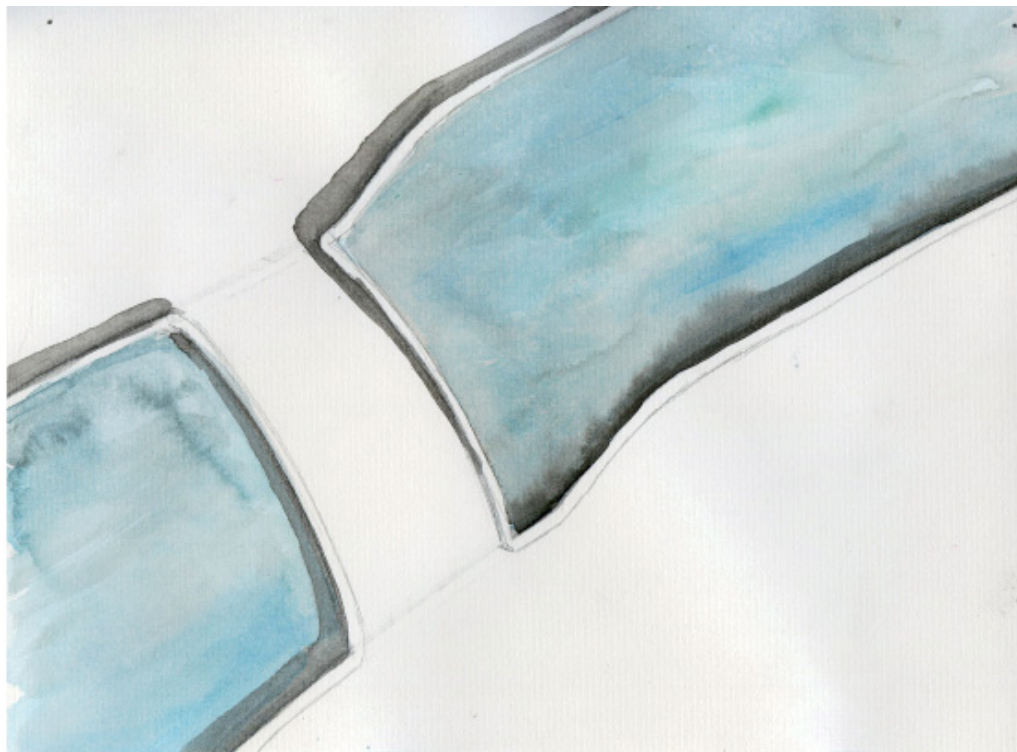
Although the old factories have not been polluting for many years, the industrial waste and sewage discharged in earlier times has not been eliminated, and therefore the area remains polluted. With garbage and sludge deposits, the water levels rose every year. Moreover, flood discharge was obstructed by the overgrowth of algae in the river. During rainy seasons, the rapidly rising water would breach the banks of the river and flood the community. Because of this, concrete retaining walls were built to block the water from flowing into the city. Since the root problem—the polluted water—was not addressed, the water levels simply continued to rise. In order to keep up with the rising water, the concrete barriers grew also taller and taller (Shtong 2014). These retaining walls have cut off perceptual and physical access to the river. Infact, the river is completely contained in what could be described as impenetrable, life—deficient, fish tanks.



River and barriers, base map from Shanghai Measuring and Drawing Institute, 2013



Traditional relationship between water and urban fabric: lots of contact



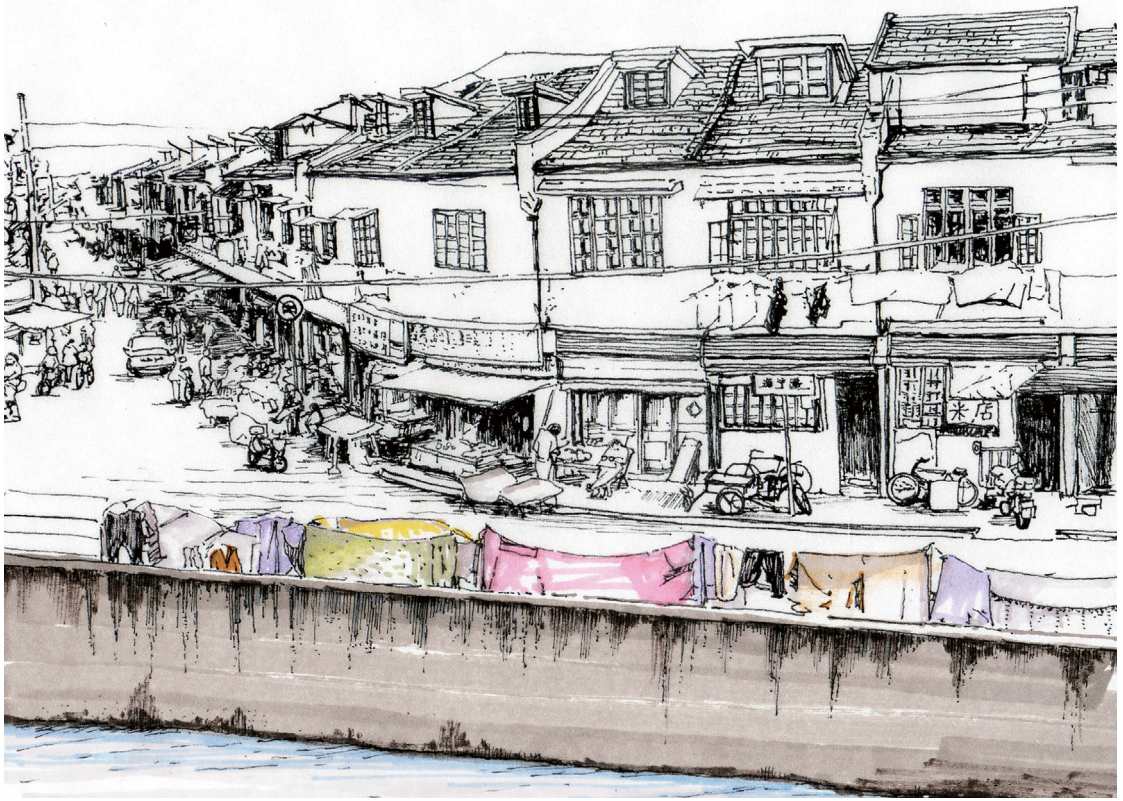
The relationship today: simplified + separated

In the last decade, to meet growing public demand for better living and natural environments, measures have been taken to treat the polluted rivers. Although the rivers largely remain polluted, regeneration efforts have achieved remarkable results. Garbage and sludge deposits have been cleaned and algae populations and growth rates have been reduced. The riverbed has receded, and flood discharge has improved. With sluices in upstream and downstream, the rainy seasons do not pose a threat anymore because the river level does not rise too rapidly (Zhu 2012). Therefore, the concrete retaining walls are no longer required. At best, they serve to ensure that people do not fall into the water. At worst, they continue to disconnect people to the river. All of these changes have set the stage for the opportunity to redesign the riverside landscape.

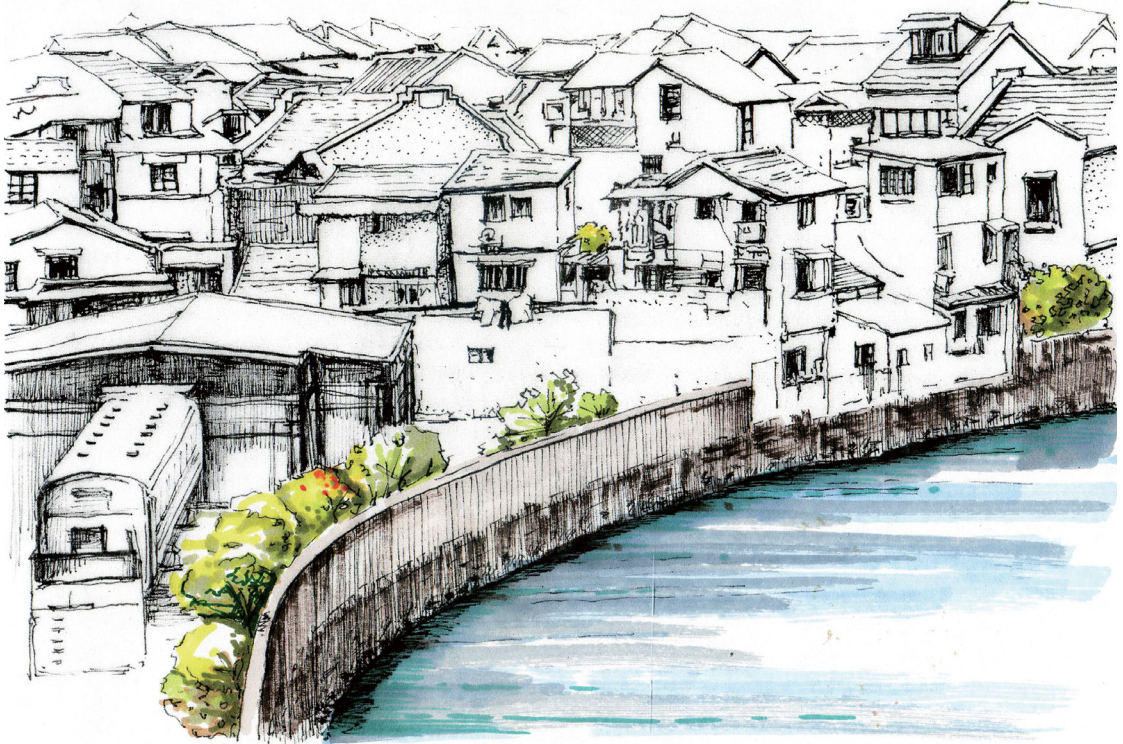
Although the concrete barriers are functionally no longer required, they remain an inextricable part of the urban fabric, as though frozen in space and time. Not only does this artificial concrete landscape separate the neighbourhood from the river, reducing the ability of people to experience water, but it also transforms the riverside into an ugly and unfriendly space. Any pedestrians unfortunate enough to find themselves along the concrete walls are squeezed by automobile-filled arteries. The area along the concrete barrier is a no-man's land where people drop trash, dry laundry and park motor bikes. The riverside has become a messy, dirty, unsafe, and dead part of the city. It is a riverside without a river, and it can only be described as lost space.



Presently, concrete barriers separate the river from the city



Drying laundry along the barriers



Drawing of barriers and neighbourhood

With increasing public demand for quality living environments, riverside community problems have attracted more and more attention. Local and government planners have applied various improvement strategies. For example, they have tiled expensive marble veneer on the concrete barriers to make them look more attractive; they have planted bushes and trees in an effort to block people from drying personal laundry along the walls; and they have posted rules to stop people from littering. Obviously, these simple and crude cosmetic solutions cannot fundamentally solve the community's problems. On the contrary, some of these shortsighted measures have, in fact, exacerbated the physical and perceptual gaps between the river and the city.



Marble veneer has been added



Planting along the barriers

2.3 The Story of Traffic: Chaos on the Road

Historically, people would walk from place to place or use water carriage transport in these riverside communities. The streets and riverbanks worked together to create a vibrant and lively social stage for local residents and visitors: children would play in the streets, neighbours would chat and laugh under trees, housewives would bargain with vendors in the market, and seniors would practice Tai Chi along the river.



Chaos on the road

However, since the beginning of the 21st century, with the advent of economic development and automotive universality, cars and their roads have taken over the riverfront. Canals have been replaced as the primary transportation network, and as such, have lost their original use. In the meantime, urban planners have forgotten that the canals, while primarily transportation infrastructure, also provided many other social and cultural benefits to communities, and to pedestrians in particular. Unfortunately, the major client of contemporary urban planning is no longer the pedestrian, but the automobile (Jacobs 1960, 7).

As has occurred in many western metropolises, Shanghai planners located vehicle roads along the city's streams and rivers. When the most valuable waterfront space is designated for fast-paced transportation, the public loses access to the river. The wall of car congestion, noise and exhaust pollution creates another physical barrier to the river—one that is arguably just as disruptive as the river's concrete retaining walls.



Roads and parking, base map from Shanghai Measuring and Drawing Institute, 2013



Traffic condition in front of the building "Shanghai 1933"

The widened lanes and high-speed vehicles have not only further disconnected residents from the river water, but they have also increased hazards for pedestrians and annexed their public space. For example, in the high-density neighbourhoods of the Hongkou district, sidewalks were narrowed to make more room for vehicles, making them too cramped to meet the basic needs of pedestrians. The noise levels reach such high decibel levels that it is difficult for people to have any form of conversation. The traffic sounds also drown out any of the interesting and pleasant background noises that are common to public spaces: singing birds, laughing children, and even the sound of the breeze (Gehl 2011, 206).

While there were always streets along the waterfront, the streets of today function very differently, and they have marginalized the public realm. Roger Trancik describes it perfectly:

Streets, no longer essential urban spaces for pedestrian use, function as the fastest automobile link, regardless of social cost.... The artery replaced the avenue and the street lost its social meaning as a multipurpose space.... [And therefore,] the modern city dweller is forced to create a social life on personal, controllable territory instead of engaging in a communal existence centered around the street. (Trancik 1986, 6)

In the case of the Hongkou district, the social interaction of neighborhoods is largely restricted to the lanes of the residential blocks.

2.4 The Story of Public Space & Activities

In recent decades, the phrase "public green space per capita" has become popular in China, especially in extremely high-density cities like Shanghai. Because local governments and mass media constantly advocate the increasing amount of it (The Central People's Government of the People's Republic of China 2012). Therefore, the public is also interested in this urban metric, and is concerned with its growth.

However, people are also confused by it: although the amount of public green space per capita has doubled and redoubled in recent years, living conditions have not significantly improved.





Public green space per capita

Part of the problem is terminology. There are two kinds of public space in Shanghai: "public green space" and "public open space". The former includes forests and landscapes along the highway and areas at the edge of city. On the other hand, "public open space" includes urban squares, pocket gardens and other community-based spaces. This differentiation is not clearly understood by the public, and therefore, it can be difficult for people to reconcile the "public green space" results in city reports with their understanding of public space in their neighbourhoods, which is more closely related to "public open space"(Huang 2011, 10).

In an old neighbourhood, "public open space" can play the role of a lounge area and a transition space. On the one hand, it acts as a communication forum for local residents. On the other, it attracts visitors to the neighbourhood and helps to keep them from venturing into the more private areas of the community. In Shanghai's old neighbourhoods, where there is a lack of public space, the narrow lane-ways between houses must serve as a public living room. As a result, almost all life-activities take place in lane-ways, and the residents' personal space shrinks.



-  Green Space for Specific User Groups
-  Public Green Space

"Public green space" and "public open space"

The high population densities of the neighbourhood mean that interior living spaces are often not large enough to host activities such as laundering and cooking. As such, many private activities must also be accommodated by the space in the lane-ways. Therefore, the lane-ways host a hodgepodge of private and public activities. Since the lanes are only three to four meters wide, the space is very cramped, and activities must compete for adequate space. Some lane-way activities are listed below:

walking, cycling, parking, dog-walking, dancing, exercising, stretching, sunbathing, washing, cleaning, laundering and drying, cooking, eating, chatting, resting, reading, gardening, removing and storing garbage, recycling, motor-bike repair, shoe repair, sewing, hairdressing, telephoning, smoking, playing mah-jong, playing cards, playing chess, children's play, and finally, bargaining, selling and buying at news, fruit, and vegetable stands.

Jan Gehl, in his book *Life Between Buildings: Using Urban Space*, classifies all the outdoor activities into three different types: necessary activities, optional activities and social activities (12).

After reviewing the types of activities that occur in the lanes, it is clear that all three categories of activities occur together in the same space at the same time (Chen, 2007). For example, friends and neighbours chat with one another while they cook and wash clothes. In this way, necessary activities and social activities are intertwined in daily life. Sometimes this can lead to stronger relationships with neighbours and can create a greater sense of community. However, it can also lead to arguments and bitterness among neighbours because of the lack of space and conflicting activities. Conflicting activities are not only irritating, but they can also be dangerous. For example, it is unsafe for children to be playing in the same space as an adult who is repairing and testing motor bikes.



"Public open space" in residential lane-way



"Public open space" in residential lane-way



Senior practising Tai Chi in lane-way, photograph by the Economic Daily



Child playing in lane-way, photograph by the Economic Daily



Bathing in lane-way, photography by 360DC

Breaking down the lane-way activities into the three categories reveals some problems.

Necessary activities :

daily work activities such as doing laundry, cooking, cleaning, packaging garbage etc.

Optional activities :

daily life activities such as resting in the shade, exercising, reading the newspaper etc.

Social activities :

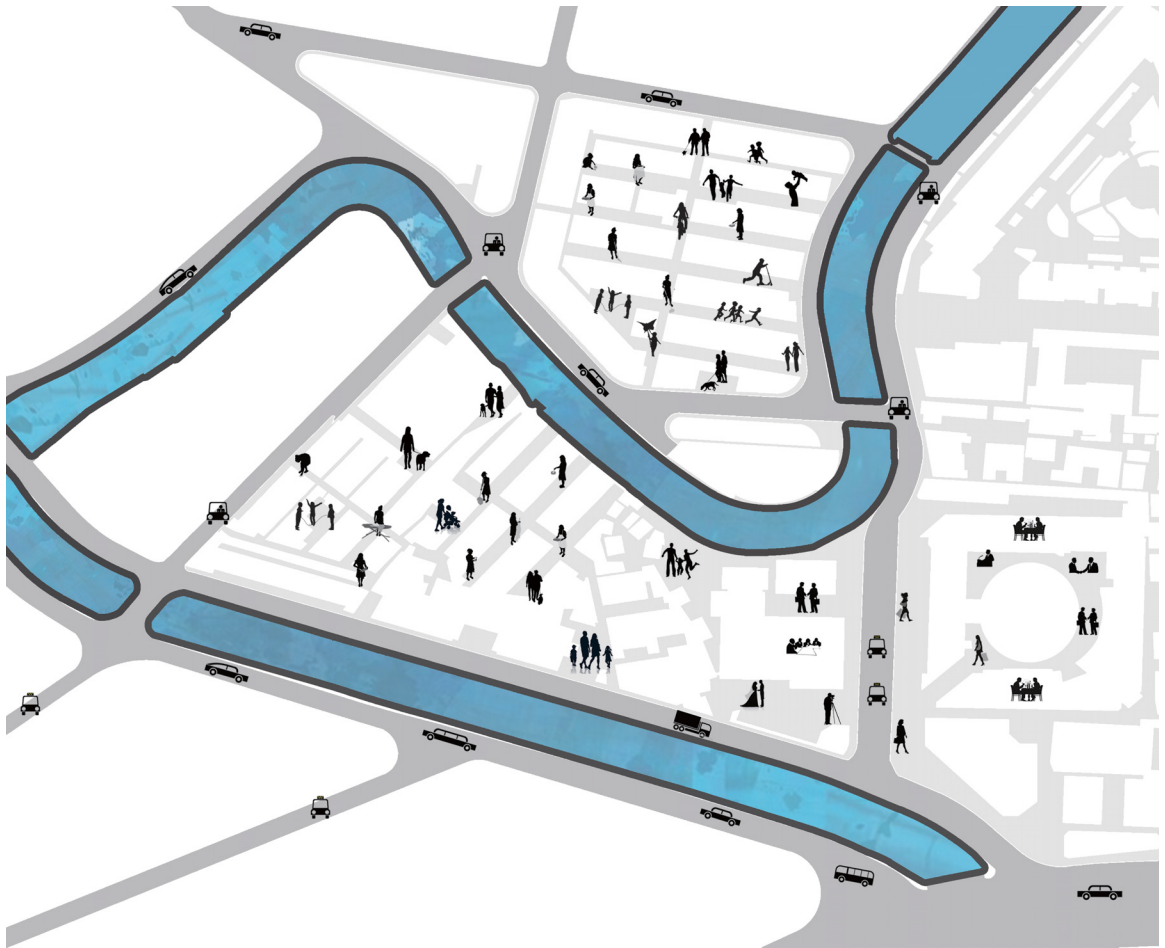
daily engaging activities such as chatting, children playing games, playing chess and cards, vendor transactions etc.



Li-Nong lane-way, photograph by Marc Riboud



Li-Nong lane-way, photograph by Marc Riboud



Activities on site

If we look closely at the outdoor activities mapped on the site, we can find that some optional activities and social activities can, and should, be brought back to the streets and public realm. These activities require more room than can be accommodated by the residential lane-ways. These activities also need public space to meet the needs of both residents and visitors.

2.5 Summary

After reviewing the background stories of the site, river, roads and public activities, it is not difficult to conclude that the neighbourhood needs more public space. Reclaiming the riverfront offers a great opportunity to not only provide public space, but to also physically and visually reconnect people to the river and its water.



Activities in the residential lane-ways

CHAPTER 3: DESIGN

3.1 I Have a Dream

I believe that everyone who lives, works or visits Hongkou has their own idea of what the neighbourhood could be. My dream is of a restored and vibrant waterfront. A place with comfortable pedestrian walkways that are unimpeded by vehicles, and lined with creative and diverse street shops. I would like to see old family workshops, having been hidden away in the laneways for three decades, return to the streets with renewed vigor.

With this new landscape, I would not feel as though the subway were the only viable transportation option. I would feel comfortable walking or renting a bicycle or boat to reach all the interesting areas of the city. I believe that others would feel and do the same. As more and more people choose green transportation methods, exhaust and noise pollution would decrease, leading to a greater quality of life for everyone.

I want to spend more time in this old neighbourhood. I dream of winters where I can watch passersby through my window whilst cupping a hot chocolate in my hands. I dream of summers where I can walk along the riverbank and enjoy the fresh breeze from the river as it sweeps away the city's sultry evening heat.

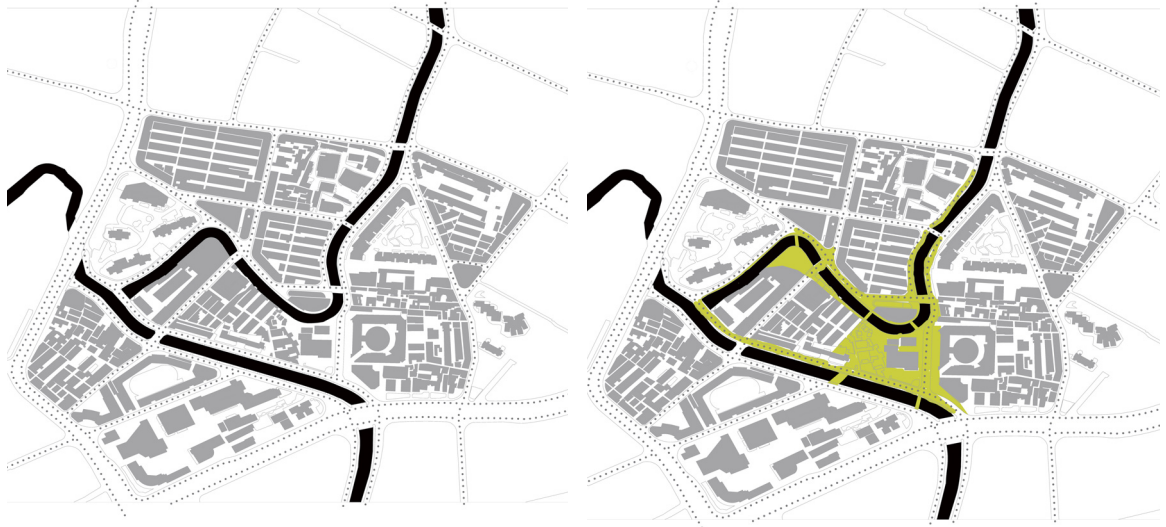


A scene from my dreams: fountain leading to "Shanghai 1933"

I do not want this just for myself, but for everyone. I would like everyone in this historic neighbourhood to enjoy life and take pleasure in their surroundings. On an ideal evening I envision children playing with a fountain in a square, friends and neighbours chatting in doorways and on steps, and seniors playing chess by the water as the sun slips beyond the horizon.

3.2 Design Concept

This thesis will redesign the urban riverfront of the Hongkou District in order to connect people back to the water and to each other. The functional landscape will serve as a recreation and social area to serve local residents. It will also support and enhance the current civic attractions—the market and creative hub—that draw visitors from across Shanghai with the addition of complementary public spaces—a market square, historical square, riverfront square and public pool. All public space and infrastructure design efforts are done in the pursuit of recovering the lost space between the water and the community. These efforts include not only the design of the physical space, but the economic and environmental sustainability of the project.



Existing

Proposed

Riverside site plan

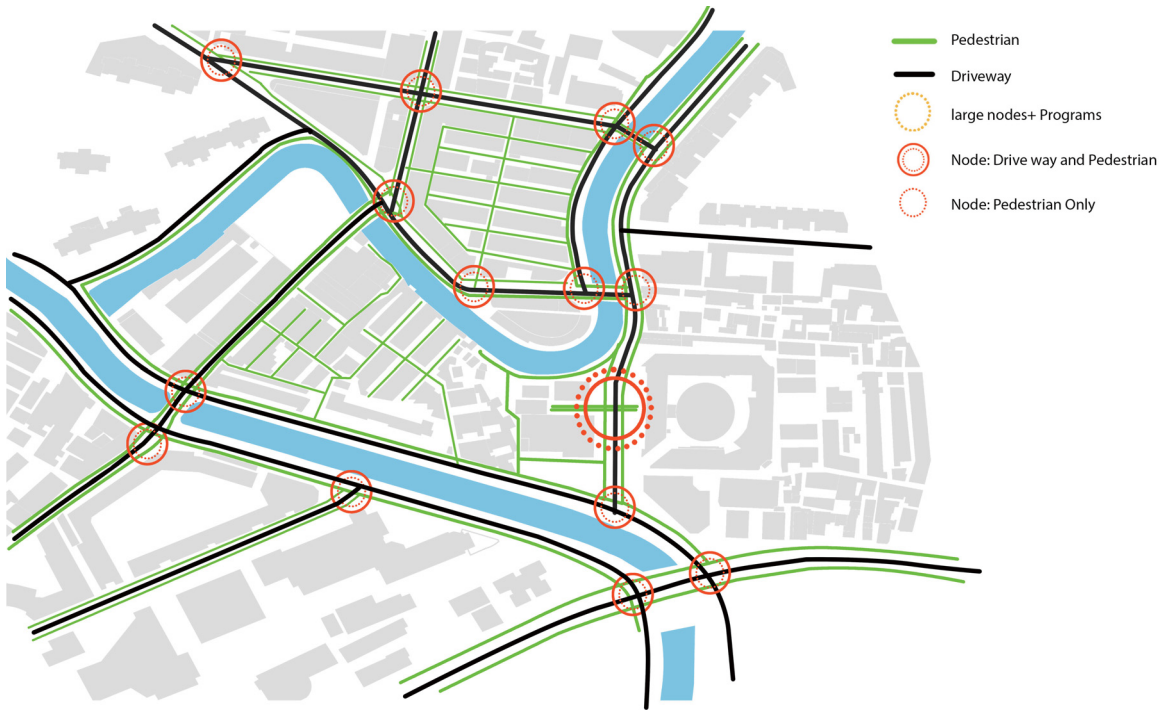
3.3 Design Strategies

3.3.1 Break up Barriers & Re-organize the Traffic Flow

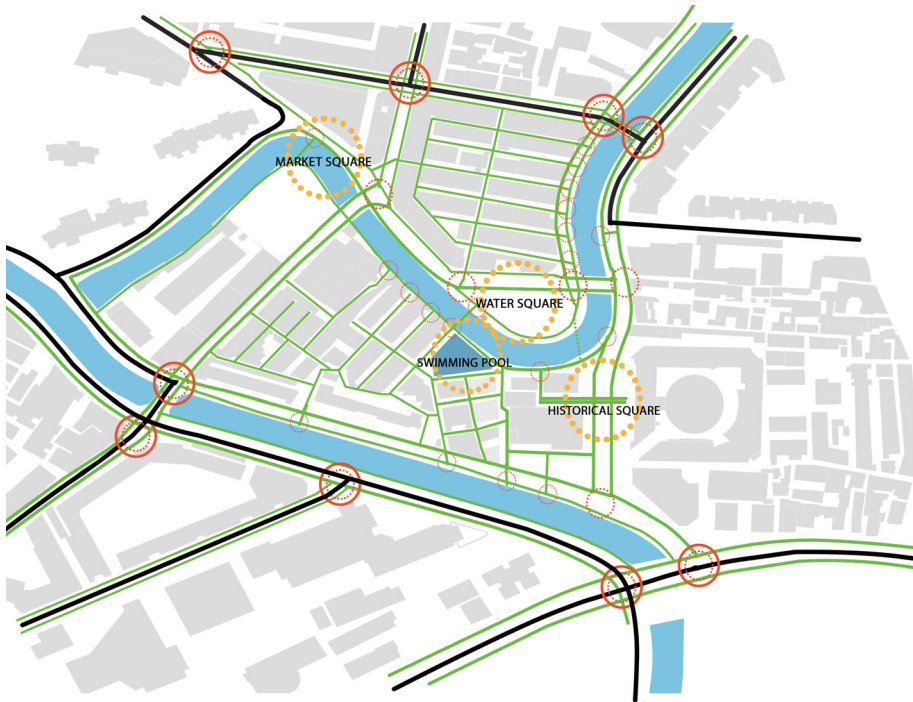
As previously detailed, there are two main barriers to the waterfront: concrete retaining walls and busy vehicular streets. Since there is no longer a need for the concrete retaining walls, they can be dismantled. The second barrier, the vehicular streets, is more complicated because traffic cannot simply be banished from existence. It must be re-organized.

The primary goal of re-designing the traffic flow in the neighbourhood is to re-establish the pedestrian routes as they have been for centuries. This done can be done by reducing the space dedicated to automobile traffic and restricting it to one side of the river. The riverside may then become a comfortable zone enjoyed by pedestrians and cyclists. Such low-speed transportation methods contribute to a good community environment, since they enable more visual connection and activities. As Roger Trancik says, "The farther away from the doors the cars are parked, the more will happen in the area in question, because slow traffic means lively cities" (Trancik 1986, 99). More important than vehicular movement and storage are urban streets and squares that become social spaces once again (Trancik 1986, 20).

The re-organization of traffic flow should not take effect immediately, as it would cause a lot of havoc. While the vehicular streets will eventually be restricted to one side of the river, this change should occur in stages. Although vehicular use will transition over time, the riverfront will not have to be redesigned for each transitional phase. Since there are buildings along the riverfront that must be serviced by emergency vehicles, the design must accommodate the use of motor vehicles, regardless of the existence of other vehicular traffic. Therefore, vehicular traffic along the riverfront will be phased by changes to traffic bylaws and public transit initiatives rather than by physical design changes.



Existing



Proposed

Traffic (movement) analysis

Phase 1:

The impact of the street on the riverfront will be reduced partly by reducing the width of the streets and partly by reducing the permitted vehicular speeds on the streets. A similar situation is found in the Woonerf areas of Holland, where the streets are primarily designed for pedestrians, but automobiles are still permitted to drive at low speeds through the area. As Jan Gehl describes it, "Cars are guests in the pedestrians' domain"(Gehl 2011, 135).

Phase 2:

Automobile use will be further reduced by restricting the time of day that they will be permitted to use the streets. For example, during the early morning, afternoon, evenings and nights, the riverfront will be designated as public space. However, during morning and afternoon rush hours, the streets can be shared by vehicles, albeit at slow speeds.

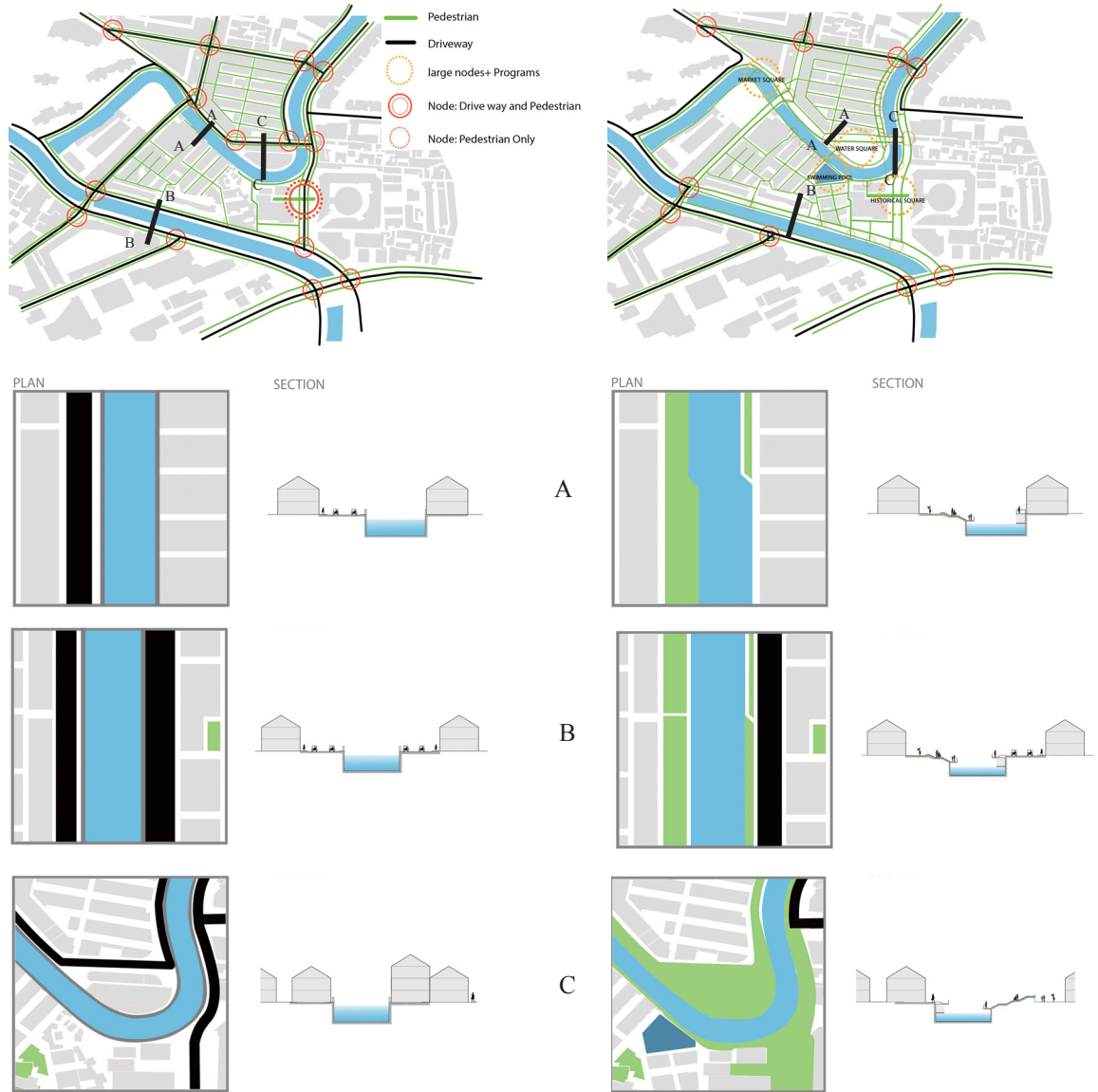
At the same time, public transportation networks and facilities in the neighbourhoods should be improved. Although the subway is accessible by a twenty-minute walk from anywhere in the neighbourhood, there should be more choice available to commuters such as mini buses, rentable bicycles, shuttle-boats, among others. As more public transportation infrastructure and options are developed, more people will be willing and able to use it, reducing the need for private automobile use, and ultimately reducing street chaos (Gehl 2011, 134).

Phase 3

Private automobile use will be completely removed from the street. As in Venice and some other European cities, car use will be restricted to the areas surrounding the riverside neighbourhood, and the riverside can be used exclusively as outdoor public space (Gehl, 2011, 135).

3.3.2 Widen the Riverside & Shrink the Vertical Gap

By removing four streets from the river's edge, the liberated space can be repurposed to accommodate new landscapes, infrastructures and programs. The amount of "public open space" and green space will increase using this strategy, and the quality of life in the neighborhood will be greatly improved.



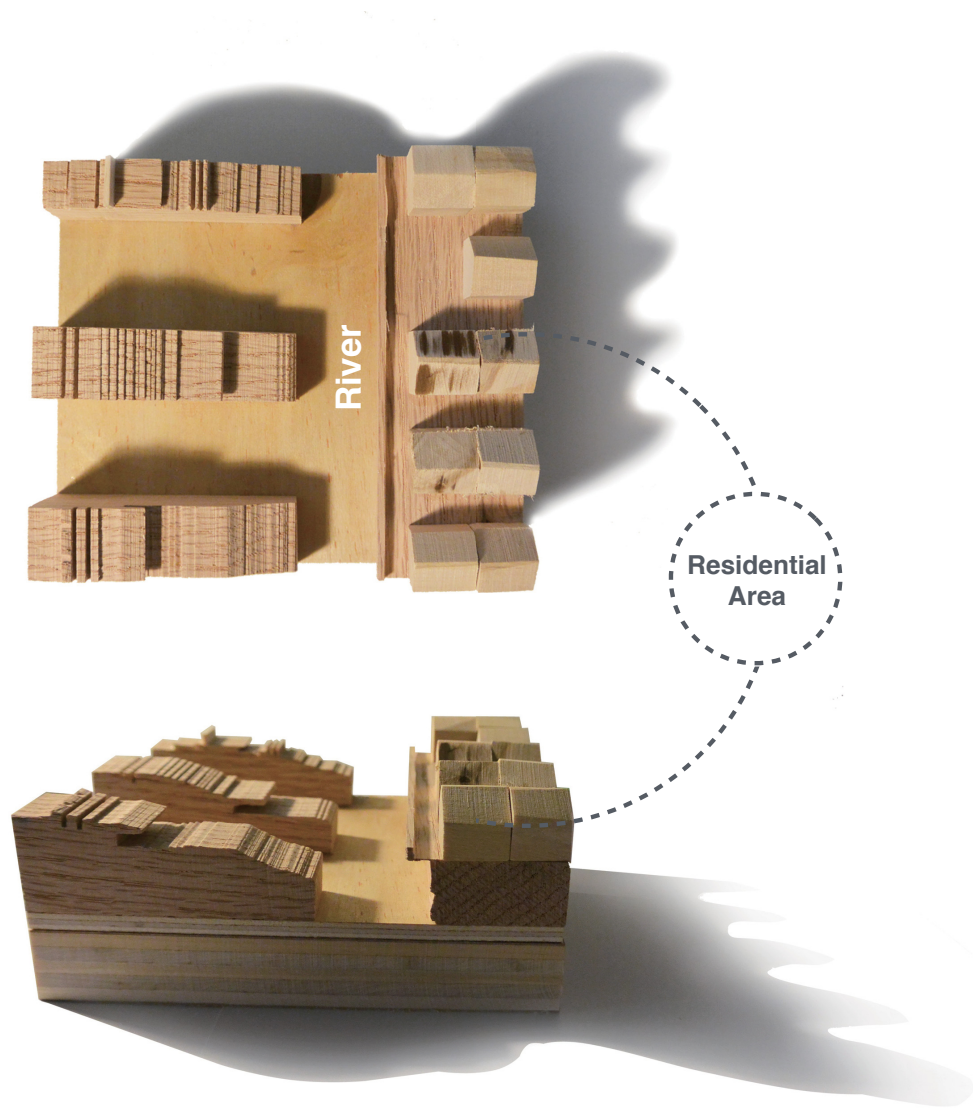
Reorganization of riverside space

Beyond repairing the space beside the river, there is also the challenge of repairing the vertical space between the land and the water.



Different sectional strategies

This series of sections explores in greater detail the possible strategies of addressing the riverside space: accessing the water and creating interaction between both sides of the river. Taking the seasonal water level changes into account, the sectional design provides multiple levels of public space for people to access the water throughout the year.

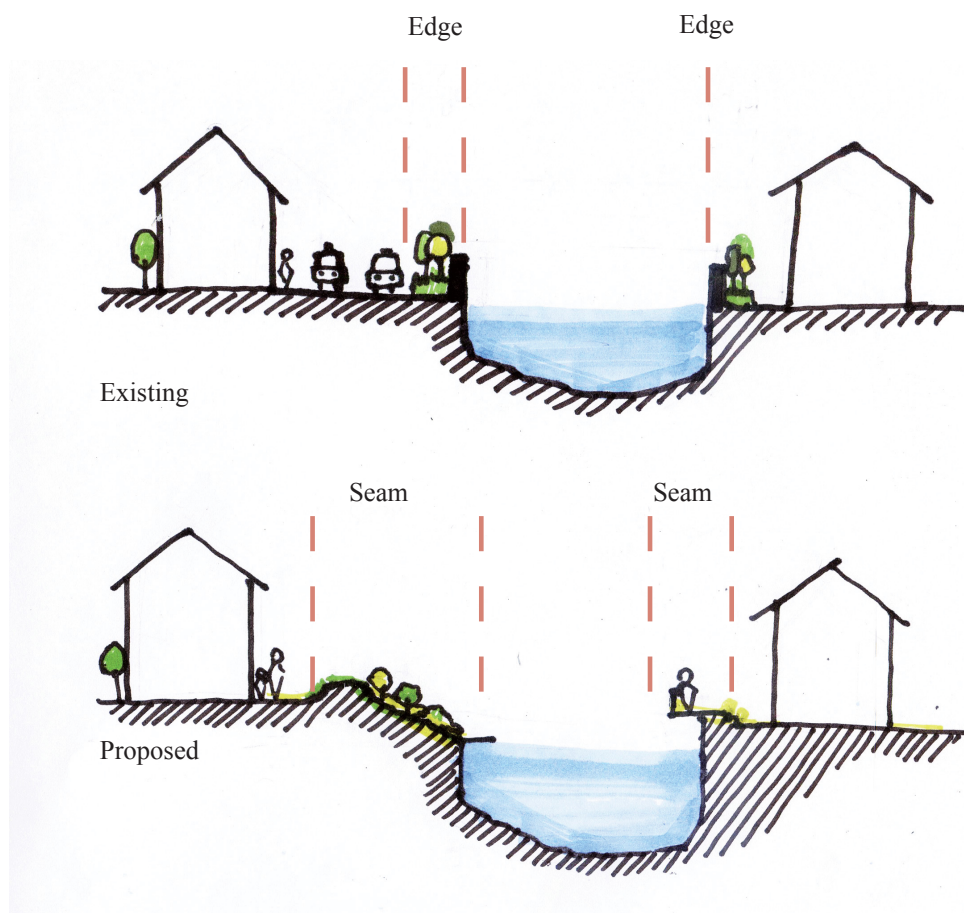


Section model: This small model study demonstrates how the various sectional strategies can create good conversations with the static riverside.

3.3.3 Physical & Perceptual Connections

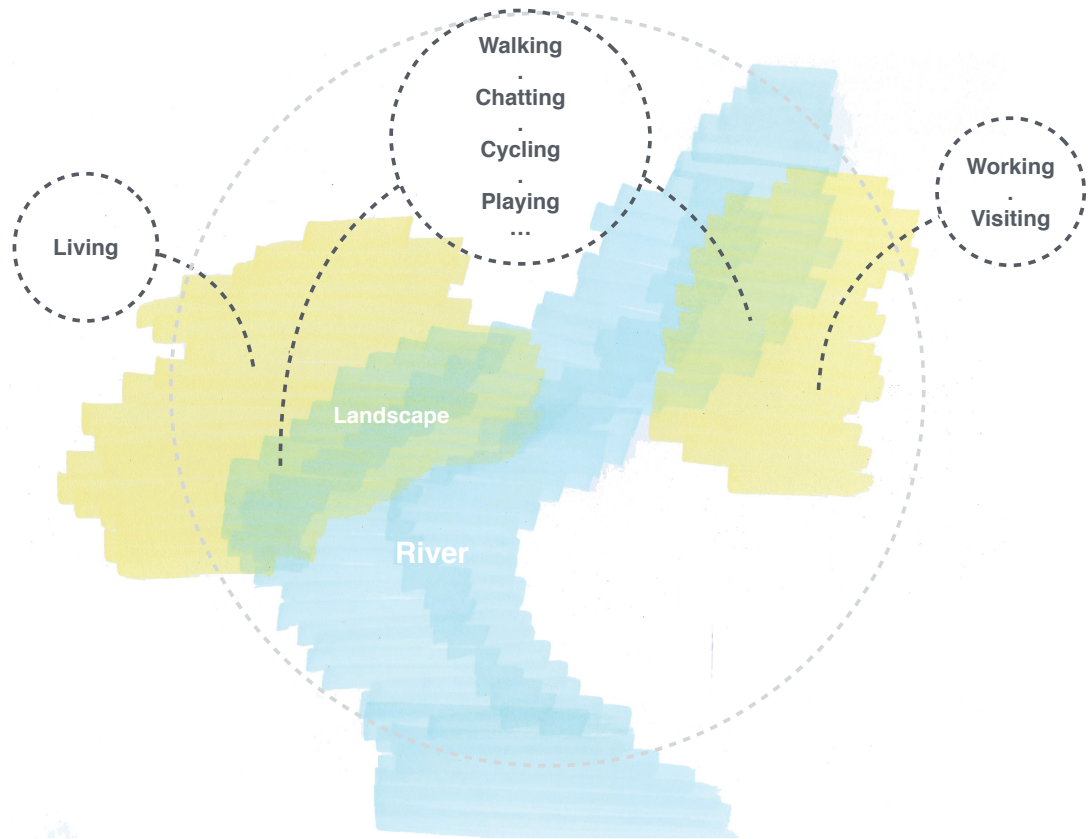
After expanding the riverside space horizontally, shrinking the land-water gap vertically, reducing traffic flows and removing the concrete retaining wall, the river edges will no longer be perceptually isolated from one another.

In fact, the river no longer has a strictly defined water's edge. Between the land and water, there now exists a new type of space. This riverside space stitches the land and the water together. Kevin Lynch describes this space as a seam rather than an edge (or barrier) because it allows motion to penetrate through it (65). Thus, the riverside area becomes a physical and perceptual connection space between the urban fabric and the river, a transition space between the artificial and natural.



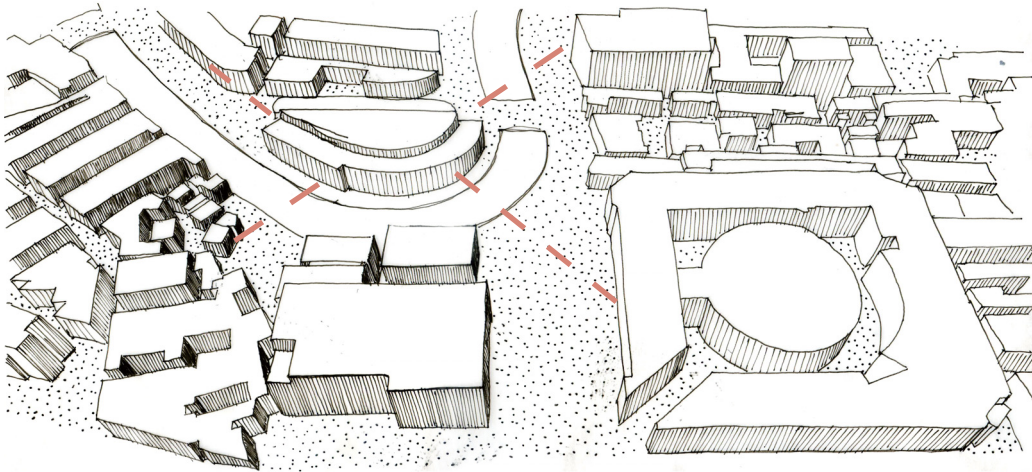
Edge versus seam

Jane Jacobs notes that Lynch was speaking of visual and esthetic problems concerning edges, but she also points out that the "same principle, exactly, applies to many functional problems caused by borders" (Jacobs 1961, 267). In this case, the riverside can also be read as a place of many interacting programs. When different public spaces are sewn together by seams instead of being delineated and separated by edges, perceptual and physical barriers are further broken: an environment that encourages cultural and social interactions emerges.

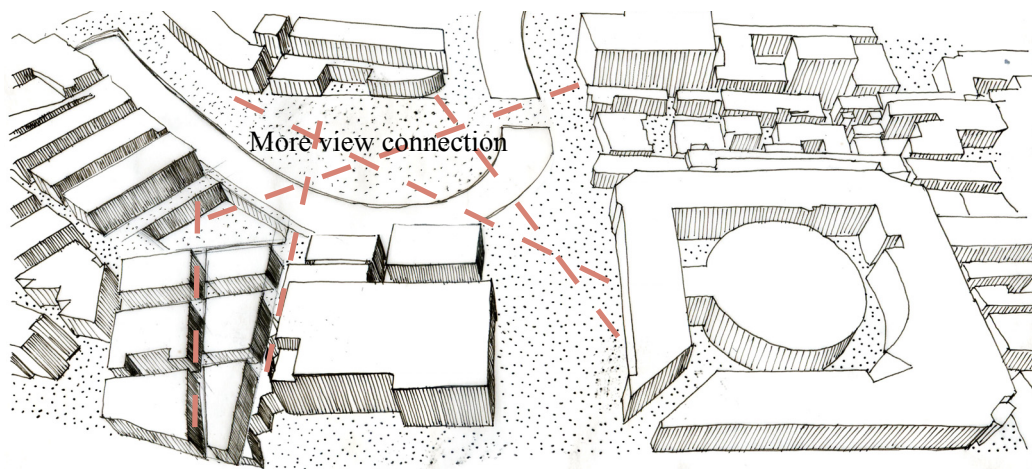


Interaction of programs

By looking at the original figure-ground plan, it can be seen that the old warehouse blocks the view to the river. This valuable space could be used much more strategically as a large open public square. This golden site could serve many different users incorporating several programs: a docking area, a stage with grand staircase seating, and an information centre with public facilities (i.e. restrooms). With a public swimming pool on the other side of the river, a greater degree of perceptual connection and a greater variety of interactive activities can take place, thereby encouraging even more diversity and social exchange. Through his own research, Jan Gehl has concluded that "Being able to see what is going on in public spaces also can be an element of invitation" (Gehl 2011, 135).

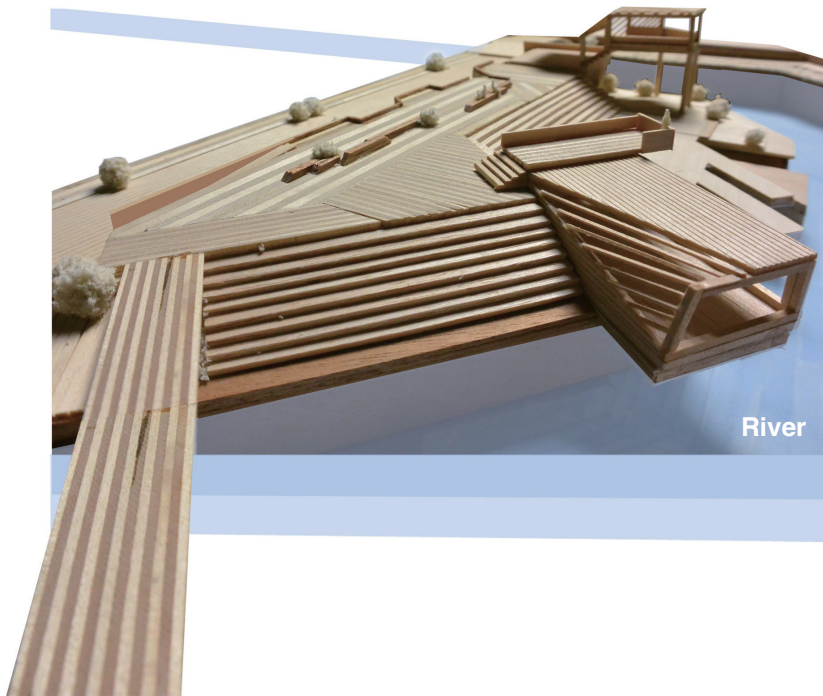
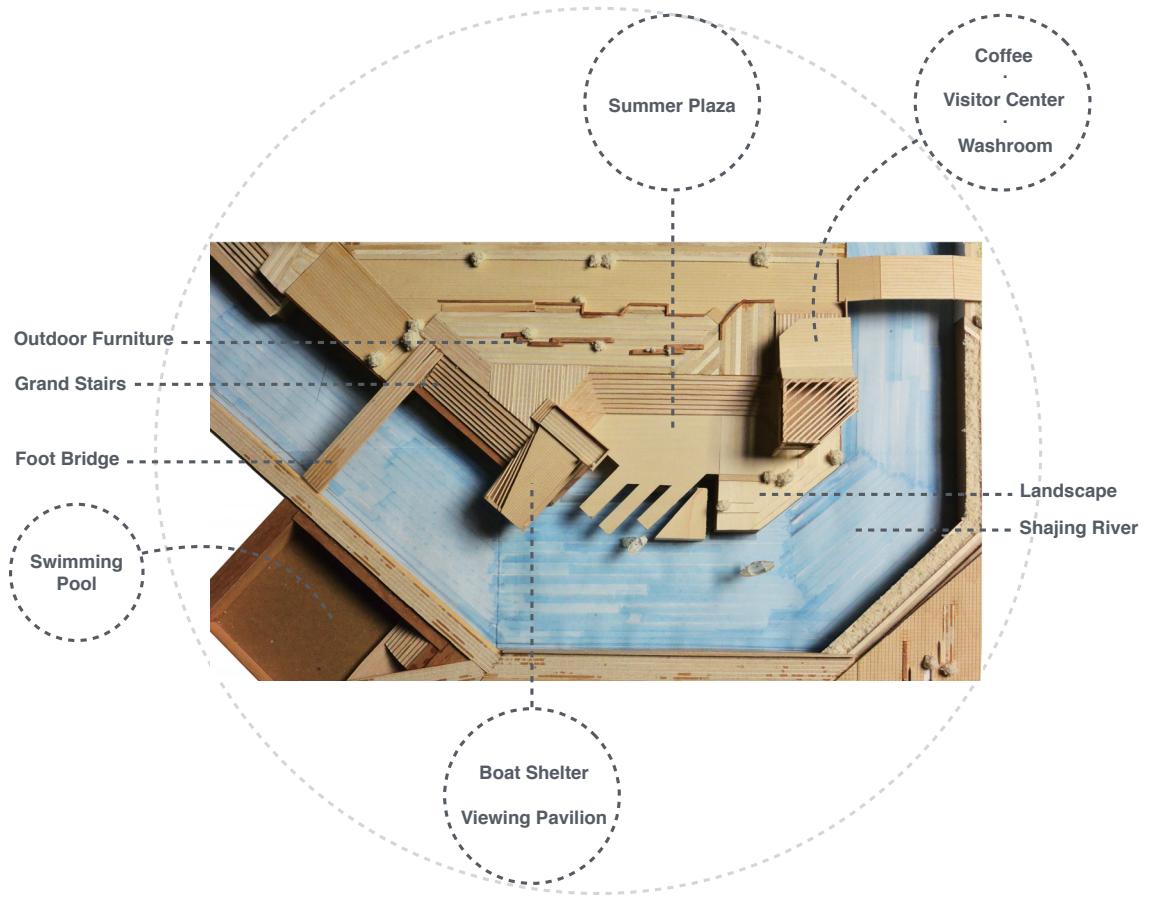


Existing

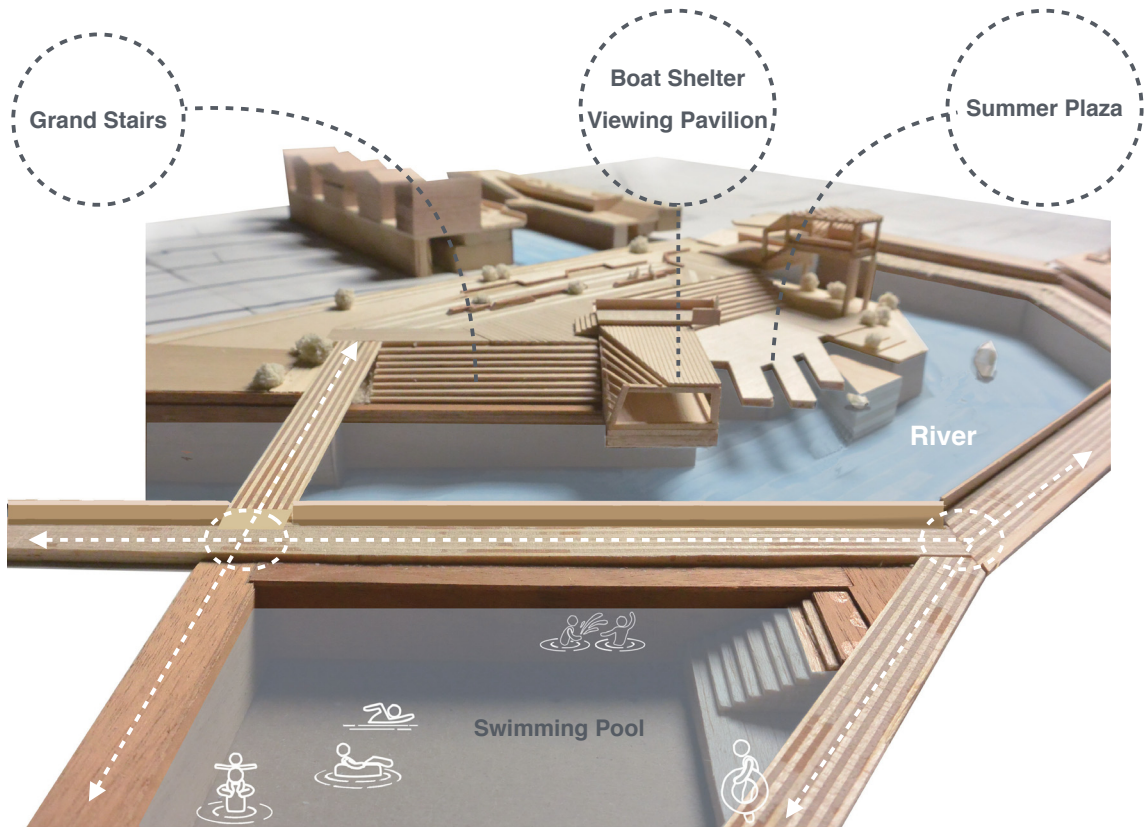
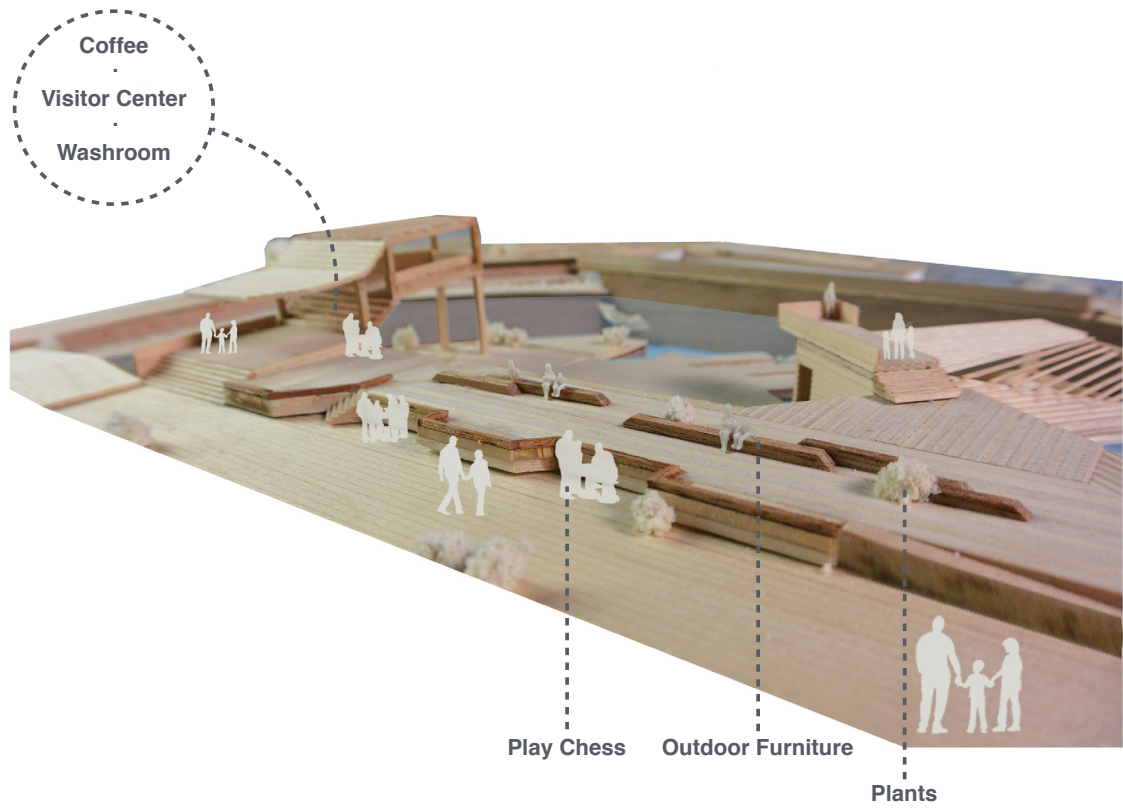


Proposed

Figure-ground relationship



Design of water square



Design of water square

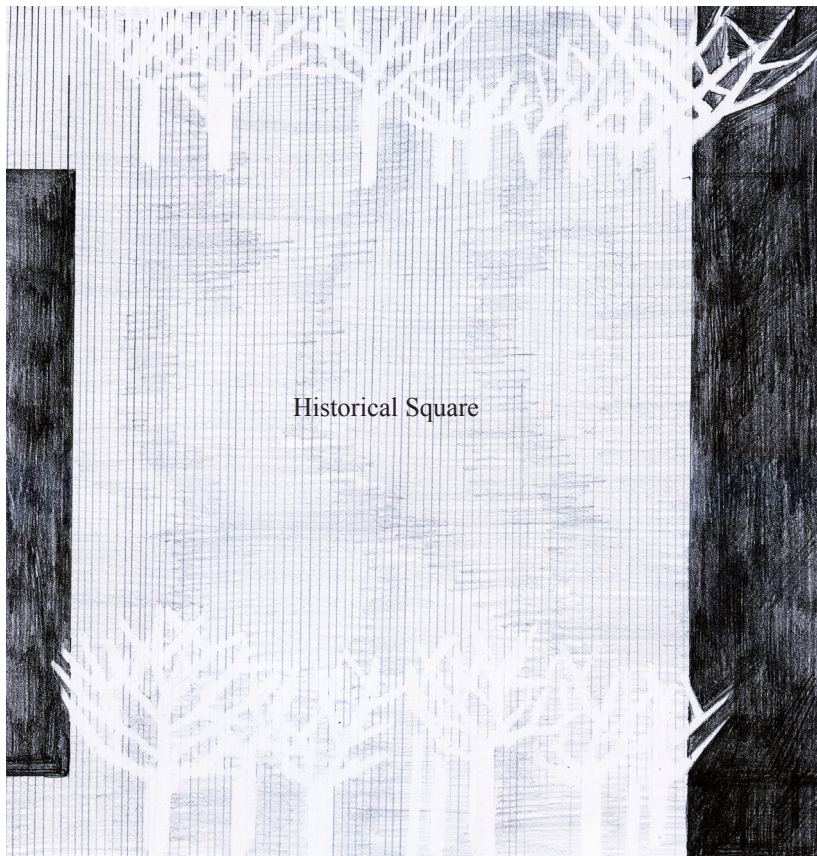
3.3.4 Other Public Spaces

Surrounded by old industrial buildings with historical facades, the space in front of "Shanghai 1933" (the district's old slaughterhouse), is currently occupied by a vehicular road. The traffic situation is already complex, and as the number of visitors rises, the more the situation deteriorates. Currently, residents use the empty space around the road as public space when traffic is light, most notably in the early mornings and during the evenings. While residents endure with what they have, this space, although large, is not properly equipped to be a safe public space. With the traffic re-organization addressed earlier, this space will be converted to a full-time public square. Given the context of "Shanghai 1933" and the industrial buildings, it would be perfectly suited as a historical square for gathering residents and attracting visitors. The creation of this square will add much needed public space while also preserving and showcasing the historical memory of the neighbourhood.



Existing condition in front of the "Shanghai 1933", photograph by Evan Chakroff

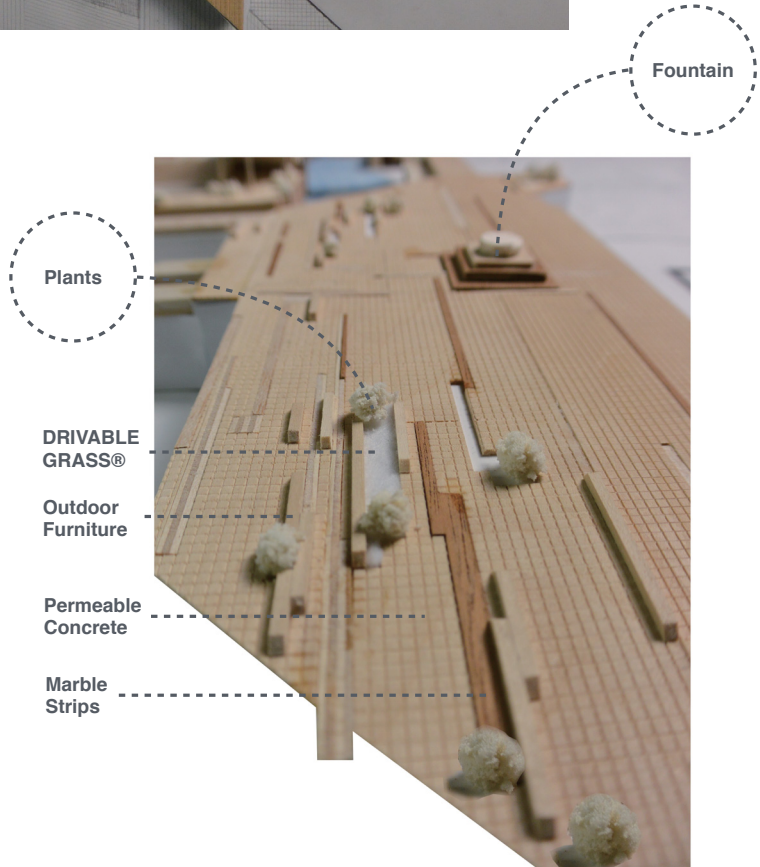
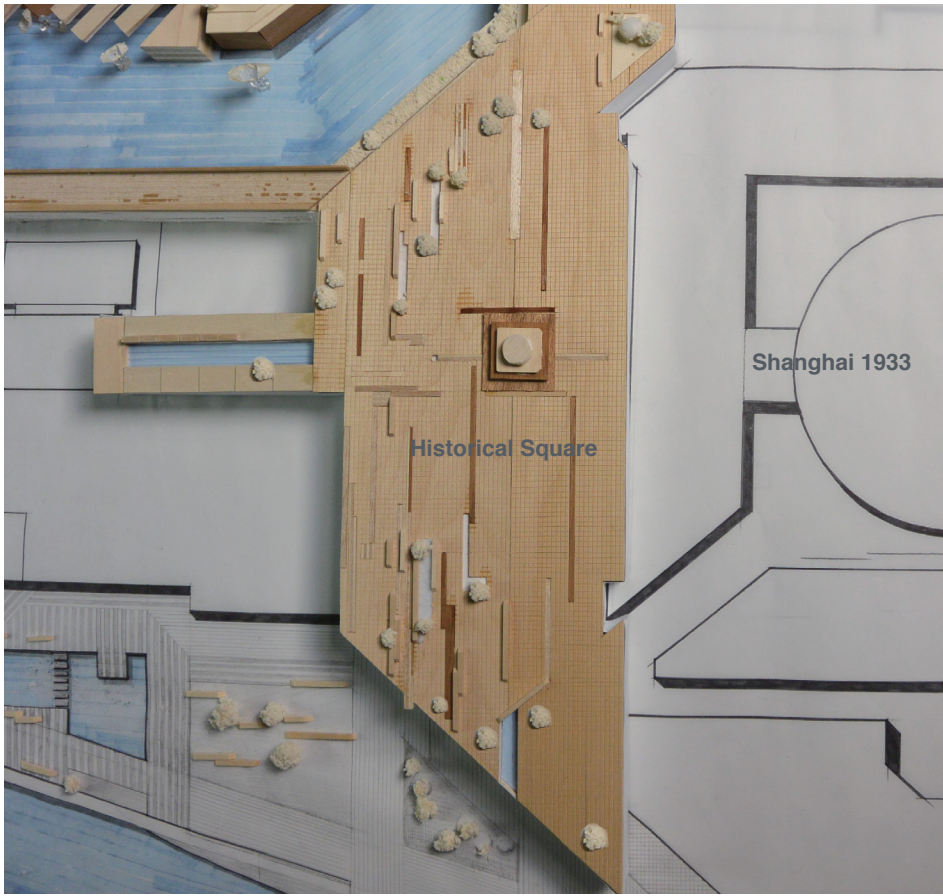
The designed plan shows that trees and bushes will be planted at the north and south ends of the historical square to help enclose the space and make it feel more comfortable and intimate. This square would then become a semi-enclosed space with solid buildings flanking the east and west sides, and leafy greens providing open, but protected, entrances. Along with the addition of green space, there will also be water features, and outdoor seating built into the landscape to enhance the usability and attractiveness of the space.



Solid and void: prospect and refuge

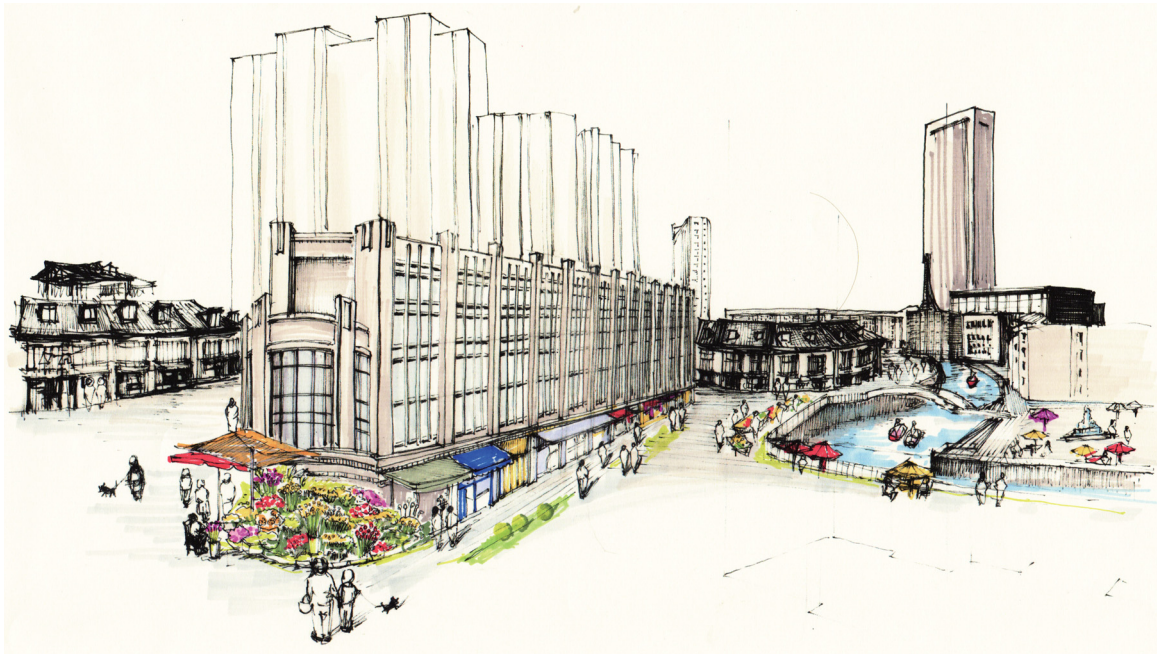


A scene from my dreams: Historical Square in front of "Shanghai 1933"

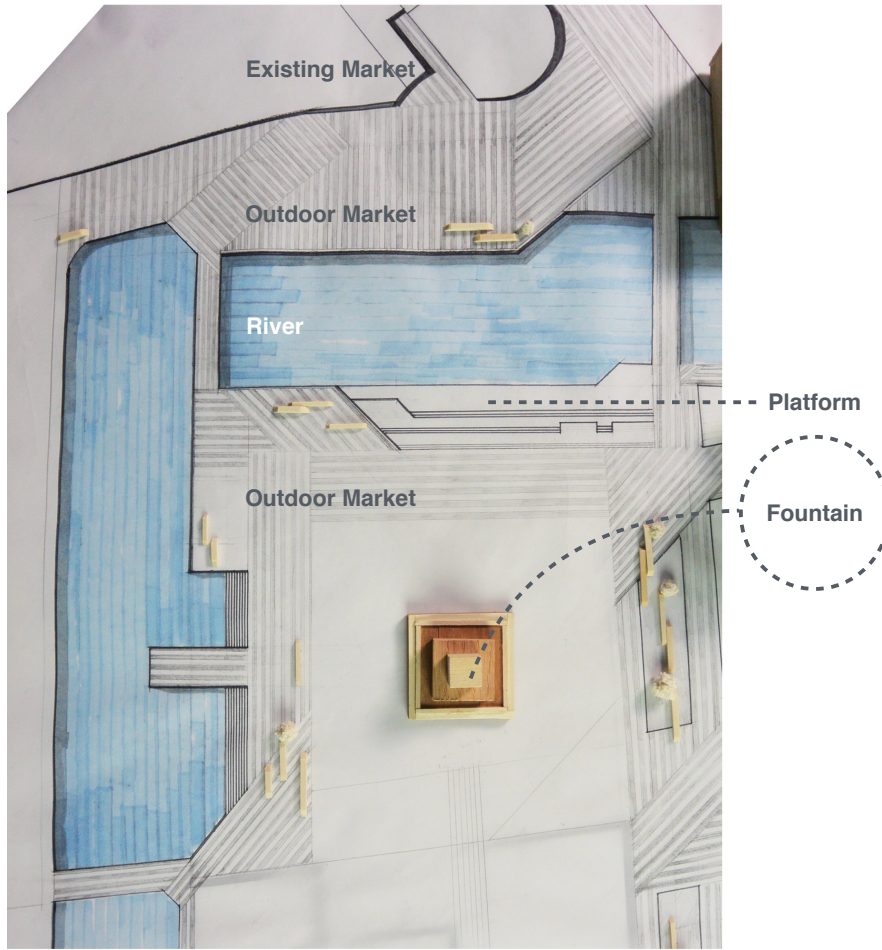


Design of historical square

Another square will be added between the river and the existing market to further support the activities of the market and enhance its connection to the water. This new market square will not only benefit the businesses within the market, but it will also help to bring more economic activity to the commercial stores located on the ground floor level of the surrounding residential buildings. With more space and added facilities to showcase services and products, family workshops that are hidden in the lane-ways could re-open to a more visible and public selling forum, giving them a larger and more captive consumer audience. This market square will help to create real jobs for local residents and ultimately repair and enhance the inner ecosystem of the neighbourhood.



A scene from my dreams: Market Square



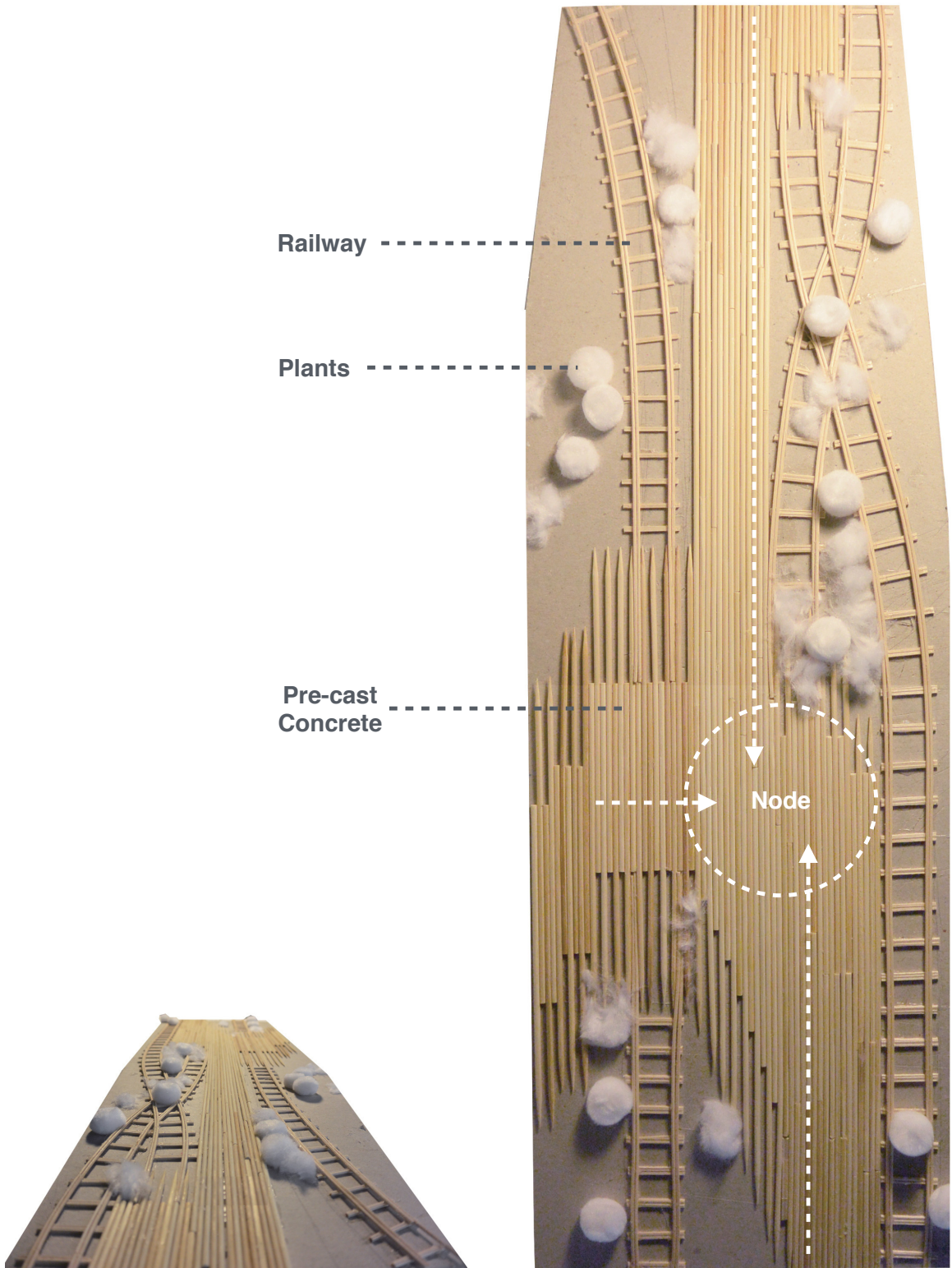
Design of market square

3.3.5 Design the Path: Texture, Rhythm & Melody

In his renowned book, *The Image of the City*, Kevin Lynch describes paths as having directional qualities (66). The different textures of ground surface can strengthen or weaken one's sense of direction and further affect people's moving activities. The HighLine project in New York City, designed by James Corner Field Operations and Diller Scofidio + Renfro, between 2004 to 2009, is a good case study of texture and behaviour. The strip pre-cast concrete paving and the sense of continuity created by the railway have strong directional qualities which encourage patrons to move forward. The materials and the direction of paver textures change when drawing close to a node area that is designed for staying and sitting.



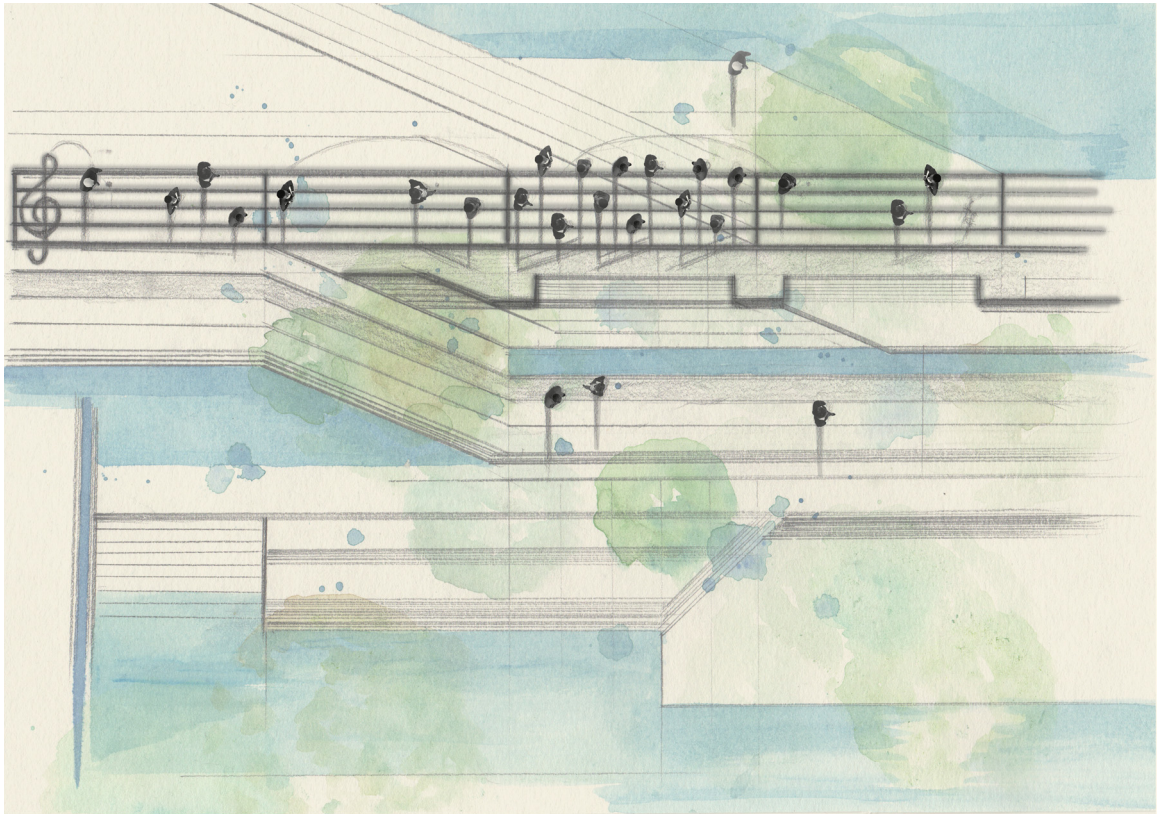
Texture and material changes in HighLine project, photograph by Partyearth, 2013



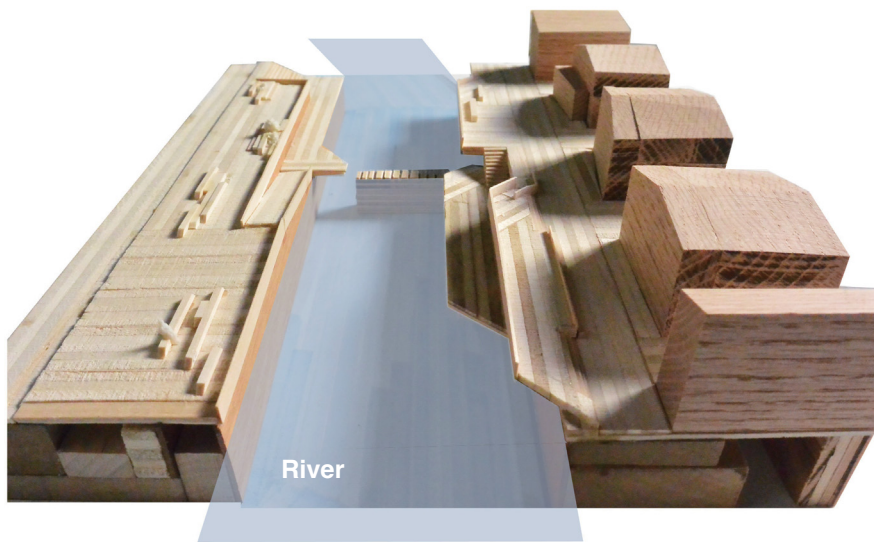
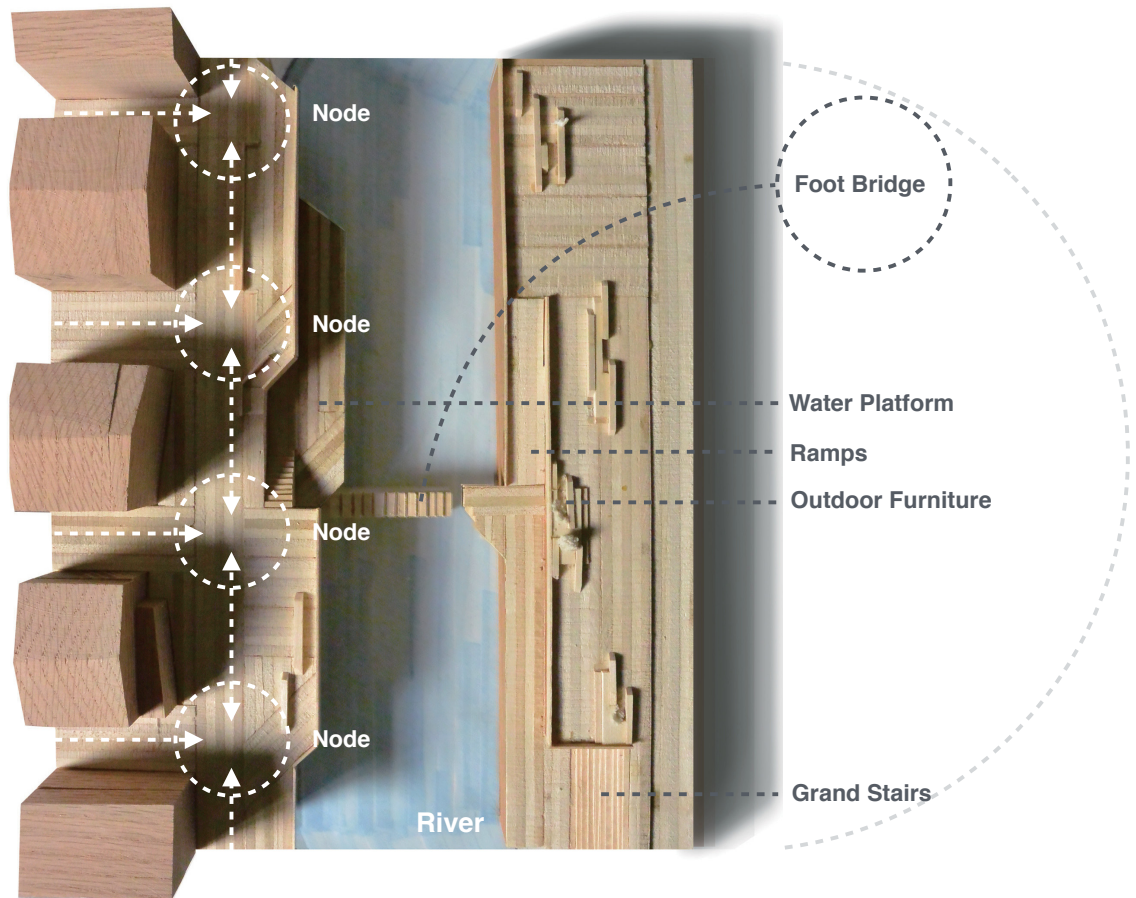
Model of HighLine project, New York City

Just as paths have directional qualities, movement—walking in particular—has rhythmic qualities. Therefore, the design and texture of the path and pavers can work together to help direct people. If the long pathway is imagined as a musical staff, the small nodal points off the main path will work as bars to break the pedestrian’s walk into rhythmic measures. Perhaps the most interesting thing is that people who are sitting, walking or standing along the path become the musical notes on the staff. The small nodes can also be imagined as breaks in the pedestrian’s walk, providing space for people to stop, rest, and linger.

The rhythm provided by the pathway can be enhanced by the rich elevation of architecture along the paths and streets. With these combined, a walking activity can easily transform from one of Jan Gehl’s “necessary activities” to one of his “optional activities” (Gehl 2011, 4).

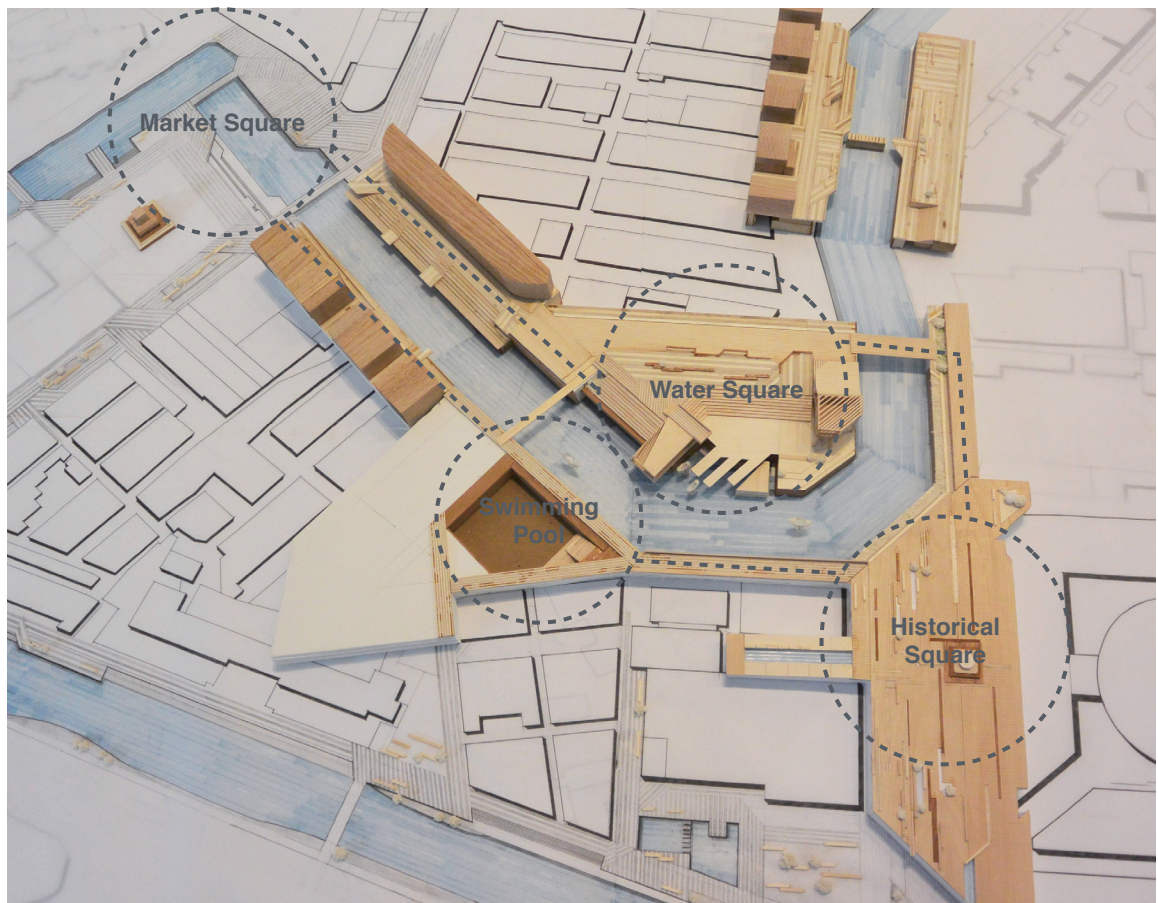


Drawing of rhythm

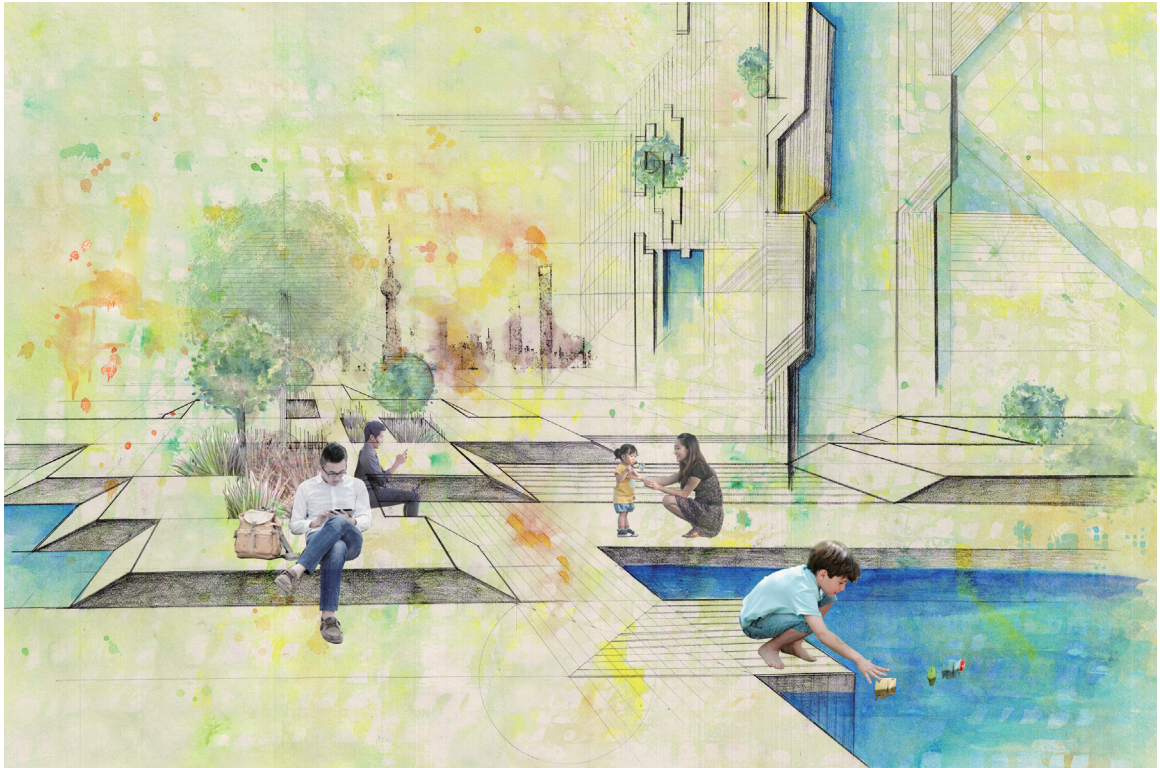


Design of rhythm

The music analogy can also be applied to the larger plan of the pathways. Lynch writes that the organization of a path or a set of paths can be melodic: "The events and characteristics along the path—landmarks, space changes, dynamic sensations—might be organized as a melodic line, perceived and imagined as a form which is experienced over a substantial time interval" (Lynch 1961, 99). In this case, the squares then become the major notes in the district and the little events along the path, between the squares, become the minor ones. All are connected melodically by the pedestrian path, and are thus very well connected to each other and the landscape.



Program connections



Drawing of the design language

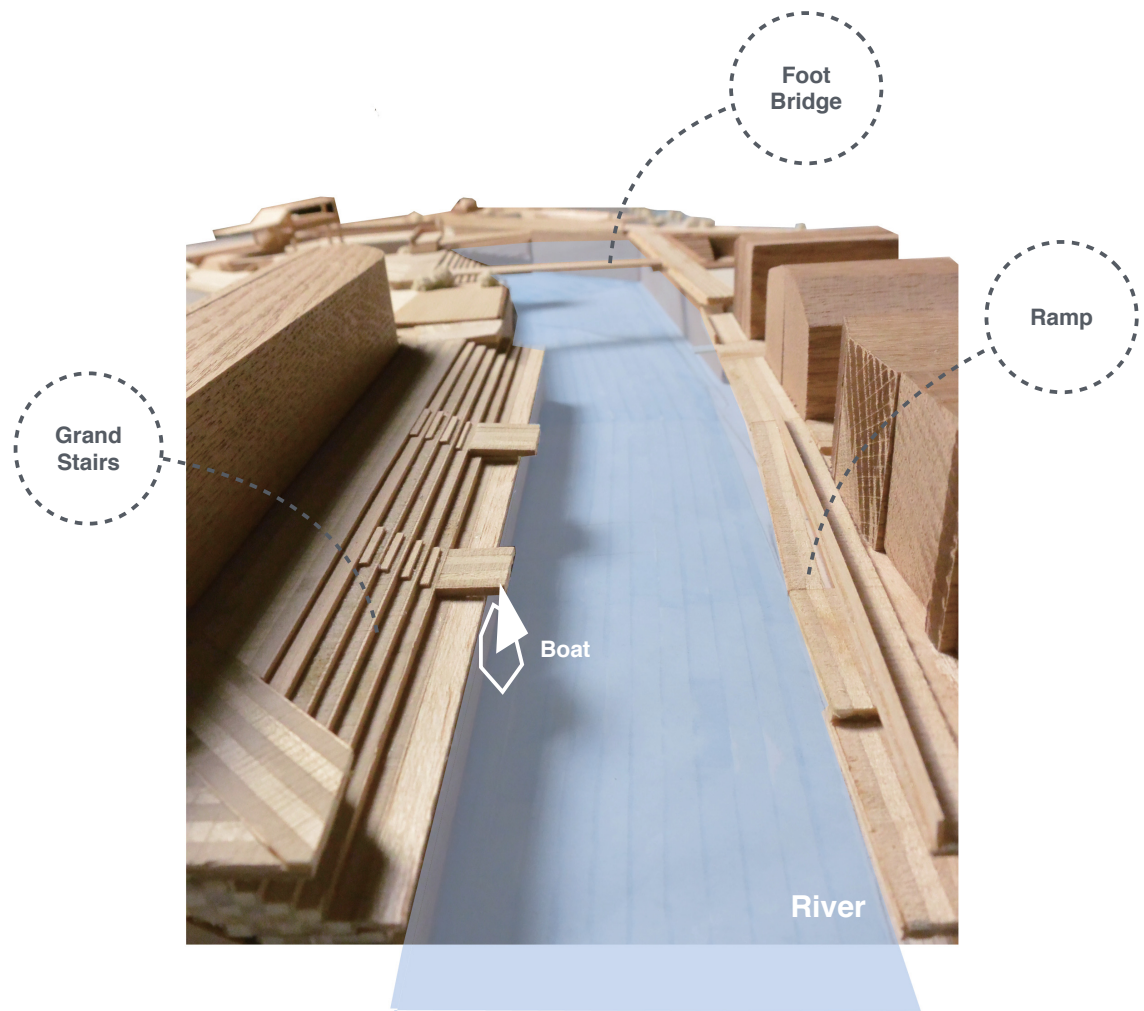
3.3.6 Designing the Details

3.3.6.1 Stairs, Ramps & Outdoor Facilities

The public spaces should provide comfortable outdoor facilities for people's staying and sitting because "lengthy stays outdoors mean lively cities" (Gehl 2011, 91) and "the design of places for sitting and standing, and their relative location, can have a direct influence on the opportunities for conversation" (Gehl 2011, 210).

In order to meet the needs of people in repose, this design will provide outdoor benches and many places to sit. The layout of this seating will be optimized to allow for a variety of activities while also ensuring that those who use the benches can sit face-to-face, back-to-back, in intimate pairs, or in bigger social groups. The grand staircase and the sitting landscapes will provide secondary seating to help keep more people in the area for longer periods of time.

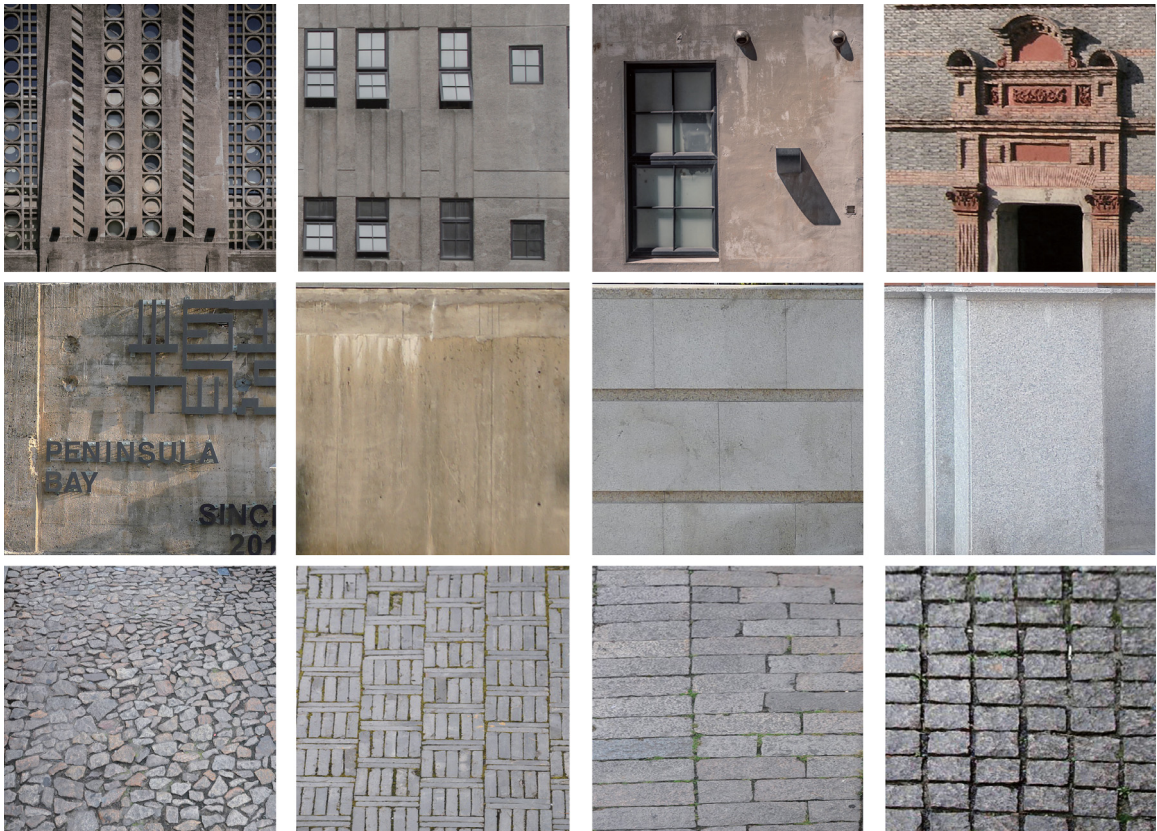
In his research on public spaces in Sydney, Australia, Jan Gehl found that people prefer using ramps to stairs when travelling from one level to the next (Gehl 2011, 180). Therefore, this is design will provide different ramps throughout the project to ensure that people are comfortable moving from one space to another. Other outdoor facilities such as lighting and water fountains would be considered as well.



Design of stairs, ramps & outdoor facilities

3.3.6.2 Paving Materials & Texture

Pedestrians are sensitive to pavement surface conditions. People do not enjoy walking on wet and slippery pavement (Gehl 2011, 167). In old Shanghai neighbourhoods, stone paving was used because it would quickly drain rainwater away from the surface into the little cracks between the stones. This design will reuse some of these materials and form new textures and patterns with them. However, most of the paving will be made of precast permeable concrete panels and Drivable Grass® in order to economize on material and labour costs. The precast concrete permeable pavers will alternate with granite pavers, ground-cover patches and concrete prisms to help with directional and textural design of the pathways.



Historical facade and the texture of pavement

3.4 Sustainability Strategies

3.4.1 Materials

3.4.1.1 Permeable Concrete Pavement

Permeable pavement is a new material that can be used instead of traditional impervious pavement. It allows for filtration, storage, and infiltration of runoff. Because of this, storm water can drain through the pavement and into a stone reservoir where it can then filter into the underlying soil or be temporarily stored (Virginia Stormwater BMP Clearinghouse, 2014).

With traditional pavements, rainwater is directed and flowed into sewers. While this may not be typically problematic for many projects, it can be very problematic in Shanghai. With heavy storm water, sewers may not be able to accommodate all the rain water that is drained into them. Since Shanghai has had sewage drainage problems in the past, it is important to minimize the amount of water drainage into its sewers. Moreover, having water drain into the soil can help recharge the soil and balance the soil's ecosystem.

Therefore, permeable pavement will be used on the pedestrian roads and in the public squares of this design in order to reduce the amount of surface rain water. The ability to drain water without the use of sewers is especially important during Shanghai's rainy season. It also makes walking on the pavement much safer because the pathway will not be as slippery as it might otherwise be.

Permeable pavers can be installed by hand, but they can be designed to be mechanically installed in segments to reduce labour costs. The pavers come in a variety of colours and sizes, so the design can be tailored to the needs of the individual projects. These are great advantages for the pathways and squares in this design: typical design segments can be installed quickly and inexpensively, while more intricate portions of the design can be finely tuned and installed by hand.

3.4.1.2 Drivable Grass®

For the green sections of the design, Drivable Grass® will be used. Like the permeable pavers, Drivable Grass® pavers also come in a diverse range of colours and sizes. They are also similar to permeable pavers in that they are economical and environmentally friendly. Because each plate is made with holes for root penetration, they are very permeable and can further help to eliminate storm water runoff while recharging the underlying soils. They will be used in the squares, pocket parks and the riverfront pathways. Because of the versatility of the product, people can walk and sit on them, but emergency vehicles can also drive over them, making them ideal for this project (Archdaily 2014).

The use of these materials is an important investment in this design to ensure that the community's sustainable development goals as well as esthetic design goals are met at the same time.

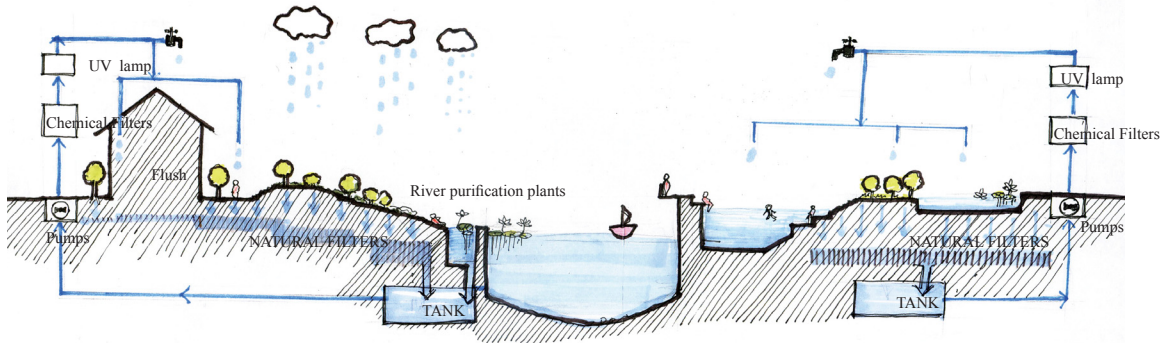


Drivable Grass® permeable pavers have many infill options including sand, rocks, ground cover, sod, stone, artificial turf and grass. Photograph by Jan Jansson, 2014

3.4.2 Rain water collection

Shanghai is a humid subtropical climate, with two rainy seasons: one from April to June, and another from August to September. During these months there is significant rainfall, and therefore, there exists a great opportunity to collect rainwater and reuse it.

For instance, rainwater can be collected from surrounding building rooftops to be redirected to reservoirs. Similar reservoirs can collect and store the water drained through the permeable pavers and Drivable Grass® pavers. The water can then be filtered and sediment can be allowed to settle. Some of the water can be used to recharge the underlying soil, as noted above, but some of it can be used for running toilets, filling ponds and cooling and heating nearby buildings.



Eco-system diagram

3.4.3 Plants & River Purification

While the landscaping along the river and the plant vegetation in the water adds greatly to the esthetic appeal of the environment, these plants also produce water filtration and ecosystem conservation benefits. By using plants and other aquatic organisms, carbon dioxide is absorbed from the atmosphere and oxygen is released. Overall, river water is improved (Rockwood 2012).

CHAPTER 4: POLITICAL ENVIRONMENT

In China, all land is state-owned, and therefore, the sale and use of land is strictly controlled by the government. Developers propose land uses and projects, but throughout the process of land development, the government maintains the dominant position and has veto power over all decisions. It is therefore the government's responsibility to ensure that rivers and riversides—important public resources—are designed, managed and upgraded properly (Sofang 2012).

Since private developers cannot make direct profits from redesigning the riverside to public space, they are highly unlikely to initiate a project such as this without government incentive. It therefore falls to the city to pursue this public good. The city of Shanghai has already shown interest in the re-development of this Hongkou neighbourhood, and it has already spent money in an effort to improve the area: as noted earlier, the city paid for expensive marble tiles to reface the concrete barriers. These efforts have been in vain, but at least these efforts show that the city acknowledges there is a problem.

The city can either initiate its own plan to redesign this riverfront, or it can mandate would-be developers to incorporate it into any development proposals that are slated for the same neighbourhood.

The designed proposed in this thesis is but one solution to this riverfront challenge. However, some lessons can be learned from this thesis and can be applied to the redesign of any urban riverfront in the pursuit of quality, equitable public space.

1. Riverside renewals and redevelopments in Shanghai often relate directly to the adaptive-reuse of old industrial areas and buildings along its rivers. These projects are often done independently of each other which can cause major problems. As in the case of this neighbourhood, the re-developments did not consider public space, the variety of

users or the connections between places. The government should continue to encourage developers to invest in the redevelopment of historic buildings with special tax policies, but more importantly, as the dominant player in the industry, it should take the responsibility of coordinating developer efforts. Doing this will help to avoid fragmented investment, contribute to the continuity of the community, and will benefit the highest number of people. Plans need to be long-term (Hu 2006, 41).

2. Any development plans must make full use of the riverside space. As a public resource, the river is an outstanding element in the shaping of cities, neighbourhood personalities and public spaces. To really take advantage of what the river has to offer, it demands greater public access. Therefore, any new development or re-development of sites that are gifted with a river should design the development around the river. Regardless of what is planned for the riversides of these sites, public space should be prioritized over private residences, businesses, industries and traffic. Otherwise, the river, which is a public resource, will be exploited by only a private few (Yang 2007, 6).

3. Projects need to be designed from a multidisciplinary perspective. The redesign of urban riversides cannot be limited to a broad band of green lawn along the river. The design must be integrated with community space-needs, social and cultural values, economic activity, infrastructural demands, historic circumstances, and ecological requirements and improvements. A one-dimensional perspective of the physical space will not procure a design that will work for either residents or visitors. It will only lead to a failed project or more costly re-designs in the future. By the same token, copying designs from other riverside projects must be avoided. Each site will have different needs and design challenges: copying is cheap today, but expensive tomorrow (Prominski 2012, 14).

CHAPTER 5: CONCLUSION

Through the re-design of a riverside community in Shanghai, residents and visitors have been reconnected with the river water by way of much-needed public space. The community and its culture are supported and enhanced by this riverfront public space. The design works to reconcile traffic, user group and land-use conflicts while also improving the esthetic and ecological condition of the site. However, this is but one solution among many to the challenges of this neighbourhood.

The design solution proposed in this thesis would undoubtedly foster economic opportunity, improve the quality of life, and ultimately boost land values, all of which would benefit residents—at least temporarily. The real success of a proposal such as this can only be measured over time. It is only after a long-term view that different solutions can be truly graded against one another (Yang 2007, 6).

The long-term perspective presents some issues to be considered. The current residents of this riverside neighbourhood are in a low-income bracket. Once the area becomes more desirable, many of these people will be forced out of the neighbourhood as it becomes more popular and rents increase. We must ask what measures can be taken to protect the interests of lower-income groups. Can these issues be challenged by architecture?

The neighbourhood might also enjoy so much visitor popularity that it loses its community roots and transforms into a tourist business zone, as did the Xintiandi and Tianzifang districts of Shanghai. In these cases, the original residents were pushed out of their homes by commercial businesses: the residential lane-ways that were once full of residential life have been replaced by shops and restaurants to meet the tourist demand. In these cases can we say that the renewal has been successful?

The original intent of this thesis, similar to nearly all thesis projects, was to improve people's lives. It is certain that people's lives will be improved by a redevelopment of the riverside, but it is not certain whose lives' will be improved. In the end, this design proposal answers the question asked of it, but questions and solutions beget more questions. The next question is whether or not we can design solutions that improve people's lives in perpetuity, and what that might look like.

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