

Up and Down Coexisting with Flood

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Last but not least, I must express my very profound gratitude to my parents, to my friends, and my classmates for providing me with unfailing support and continuous encouragement, even in the most difficult moments. I cannot grow up well without them. Thank you very much.

東海大學建築系碩士班
建築碩士學位論文

“上” “下” 之間，與水共生
Up And Down, Coexisting With Flood

研究生：關普陽(Guan, Pu-Yang)

經審查及口試合格特此證明

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中 華 民 國 1 0 8 年 6 月

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Main Design



Up and Down Coexisting with Flood

Main Design
M.Arch II, Program C(Spring, 2019)
Advisor: Simon Shu

As climate conditions become more and more extreme, Donggang fishing port is facing the challenge of flooding. What's worse, some lands would be flooded daily in 2050. Faced with this global issue, people are responding in different ways, including floating buildings, elevating buildings, raising floodgates, and so on.

As an old town, Donggang loaded people to the memory of life. Large-scale construction is difficult to implement and passive evacuation is the last choice. Donggang is unable to cope with future flood disasters under the current conditions.

The design wants to seek ways to cope with flood actively through the reuse of cargo containers which wants to subvert the traditional way of thinking and responding to flood. It's necessary to keep the urban public space alive even during flooding. At the same time, people's activities can continue in another appropriate and interesting way. I am glad to see that people can coexist with flood, which can show the extraordinary charm of Donggang.

SITE LOCATION



Taiwan



Donggang, Pingtung



View of site



Site

CURRENT SITUATION

"Excellent **scooter** repair skills
whether on land or water"
Old repairer said with pride
Under the porch
Space for them to perform



In front of **Stationery Store**
Awning overhangs
Ground been **elevated**
To protect books well
Children soaked themselves in
reading comic books
In tight spaces



Seafood is a local specialty
Tourists taste the delicacy
Praising the **fishermen**
who are making a living by the sea



In spare time
On the **banks** of the river
Fishing and chatting
About more and more **rain**
More and more serious **flooding**



The **bridge** is the only way for students
to **go home**
They have to **weave through**
Motorcycles and cars
Very carefully

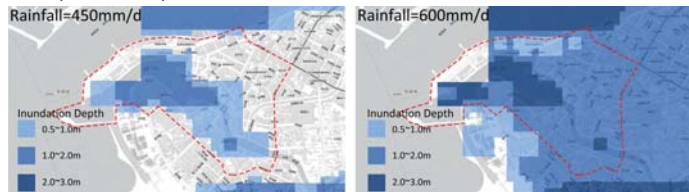
In the square of temple
People **gather together**
Feeling the festive **atmosphere**
A common memory for all



Locked **boat** to the shore
Father's laughter mingled with the **smell of fish**
Until the next fishing trip
His children don't have to **look afar** with worry again

FLOOD ANALYSIS

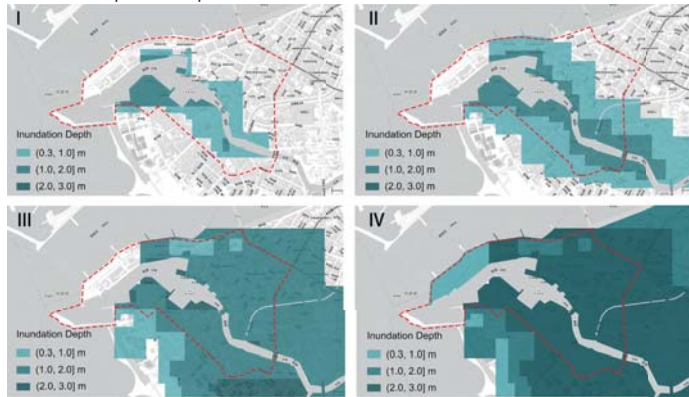
Flood potential maps



Sea level maps



Flood development maps



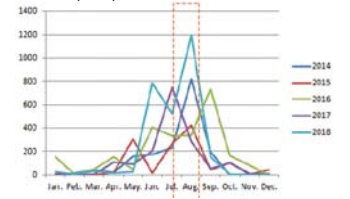
7

PRESUPPOSITIONS

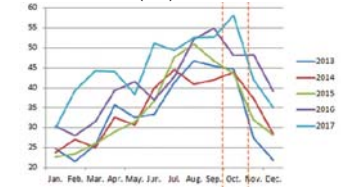
Historical flood maps



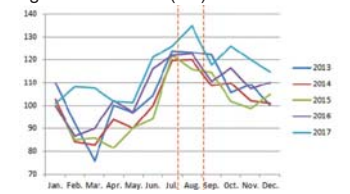
Rainfall(mm)



Mean tide level(cm)



Highest water level(cm)



Based on the analysis of the existing data, we can predict the flooding situation of Donggang in the future simply.

Normal situation
(HW≤0.3m)
Time:January~Early June,
Late October~December

Flood rising and receding stages
(0.3m<HW≤1m)
Time:Mid to Late June,
Mid to Late October

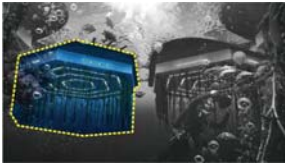
Flood stabilization period
(1m<HW≤3m, 2m is most common)
Time:July to September

Extreme environment
(HW > 3m,The water level is still rising)
Time:Very rare and unpredictable

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CASE STUDY

Countermeasure A: Floating Oceanix City/BIG



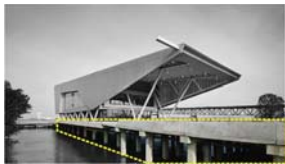
The first sustainable and self-sustained floating community Oceanix City is designed as a human made ecosystem channeling circular flows of energy, water, food and waste. The disadvantage is that the amount of the project is huge. It needs to be developed in a new area, which is difficult to implement in insufficient marine space stock.

Countermeasure B: Lifting Lifting house/England



Lifting houses are usually the same as ordinary buildings, but when floods are approaching, houses can be lifted five feet above the ground by a huge jack in a few minutes to avoid flooding. The whole house needs special design from material to structure, which is difficult to operate for the old house.

Countermeasure C: Elevated The Water Institute/Perkins+Will



Perched 35 feet above the Mississippi River, on the site of Baton Rouge's historical city dock, sits the new headquarters for The Water Institute of the Gulf. Elevated structures are suitable for flood-prone areas, but the foundation should be stable, so it is not suitable for construction in seismic active areas.

Countermeasure D: Floodgate Floodgate/Kaohsiung city



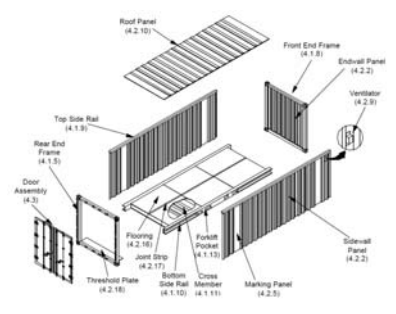
Flood gates are installed in shops along the streets of Kaohsiung City. When the rainy season comes, the gates fail to prevent commodities from being soaked by rainwater. It will affect normal life, and the method is very passive.

STRATEGY

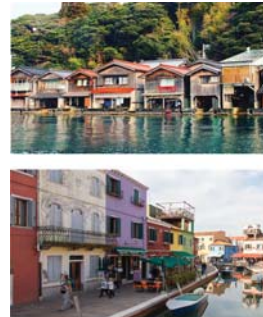
Abandoned Cargo Container



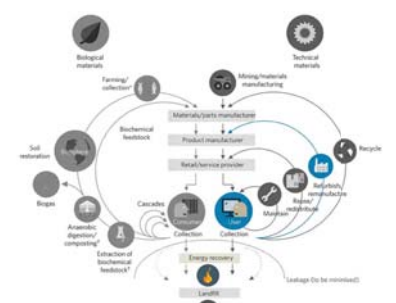
Structure of Container



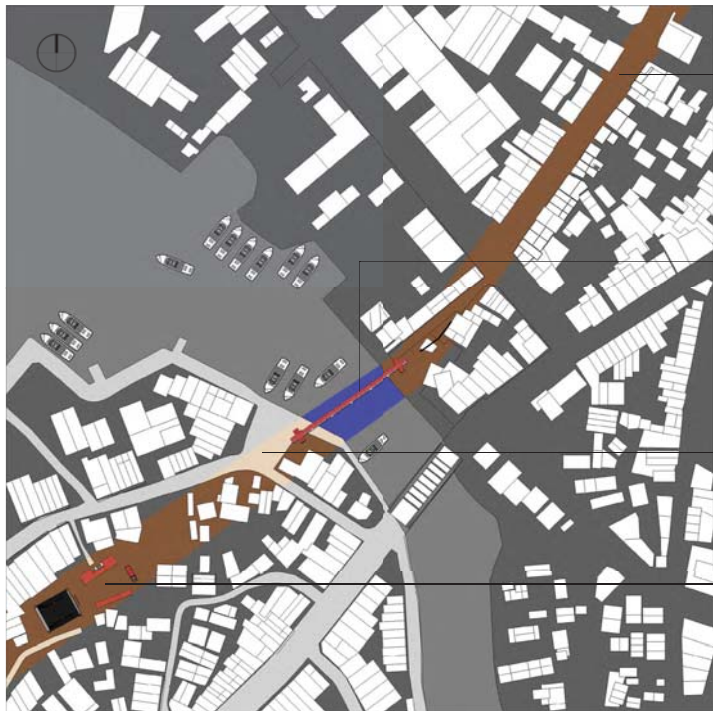
Consciously Adjustment



Circular Economy



General Plan 1:1200 Hw=0.0m



Street space
 A ramble after rainfall
 Street car to drive to
 Pedestrians hurry to and fro
 Height of awning changes
 Corresponds to the passage of time



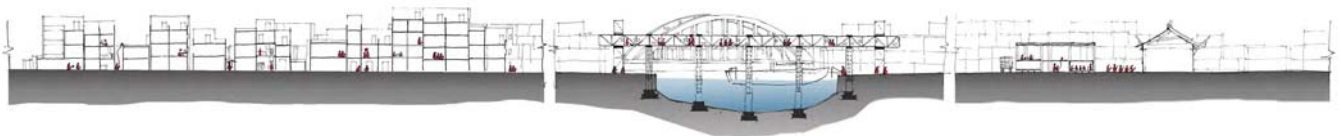
Bridge
 Children walk or cycle safely
 across the container bridge
 On their way home
 Tourists also take photos on the bridge
 which offers the best view of Donggang

The banks of the river
 The fishing boat is docked neatly on the shore
 On the banks of the river
 Old people are fishing and chatting
 Children help to organize fishing gear



Square of temple
 Some religious activities will be held
 The container truck brought the puppet show
 It became a gathering place
 People playing, dating, buying and selling,
 The old men also come here for health checks

A-A Section 1:1000 Hw=0.0m



General Plan 1:1200 Hw=0.8m



Street space
 There were few people in the street,
 only rescue boats moving back and forth.
 Some gingerly boarded the ship,
 others simply bandaged it.



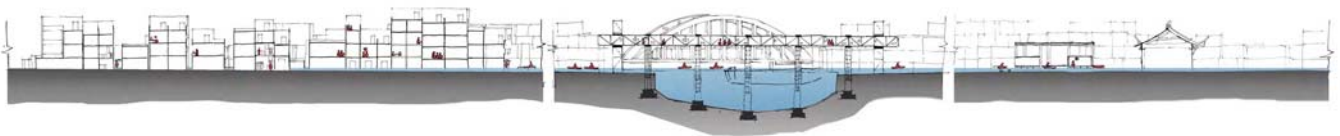
Bridge
 Only disaster relief professionals
 were left on the bridge
 looking through binoculars at the area
 in need of rescue.

The banks of the river
 Fishing boats will take up
 some of the rescue work



Square of temple
 The space was turned into a place for
 emergency treatment of the wounded
 and then they were transported
 by large ships to larger hospitals

A-A Section 1:1000 Hw=0.8m



General Plan 1:1200 Hw=2.0m



Street space
 More and more ships congregate
 Forming a certain scale of water market
 People come and go on the road before the door
 become accustomed to going grocery shopping



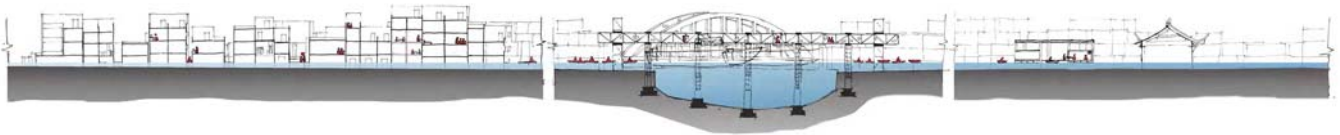
Bridge
 The current is swift under the bridge
 difficult for small boats to get through
 The bridge became a small transfer station
 Connecting people on both sides of the strait

The banks of the river
 There are many ships docked under the bridge
 becoming a little dock
 The larger ships sailed as usual
 Taking the students to and from school



Square of temple
 The temple yard has become a water market
 People can also gather here to rest and talk.
 The nearby health center
 has also been turned into a medical center
 to sell some medical drugs
 and provide simple medical services.

A-A Section 1:1000 Hw=2.0m



General Plan 1:1200 Hw≥3.0m



Street space
 People can be evacuated by emergency services
 The old man refused to leave
 Staying with the home



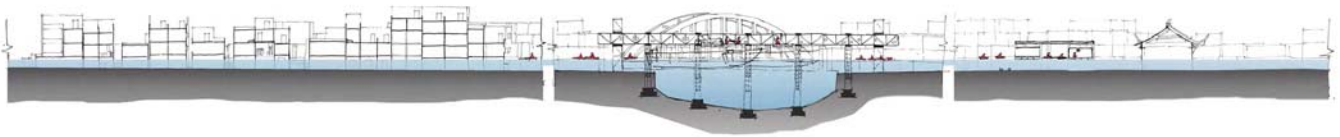
Bridge
 The bridge becomes a vantage point
 Look for areas in need of rescue

The banks of the river
 Aid boats are moving back and forth
 Carrying people and supplies



Square of temple
 The temple yard has become a water market
 People can also gather here to rest and talk.
 The nearby health center
 has also been turned into a medical center
 to sell some medical drugs
 and provide simple medical services.

A-A Section 1:1000 Hw≥3.0m

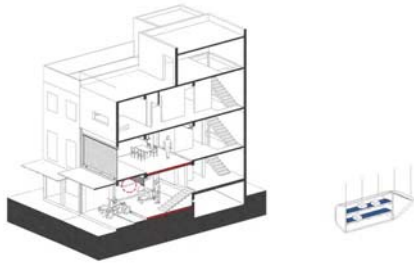


SCOOTER REPAIR SHOP

Scooter repair or
Water scooter repair
Depends on height of water

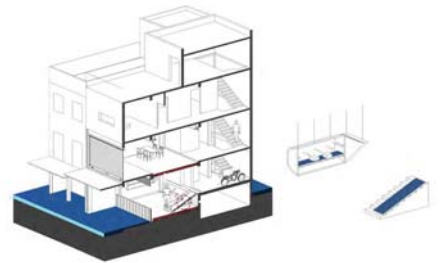


1 : 300 Hw=0.0m



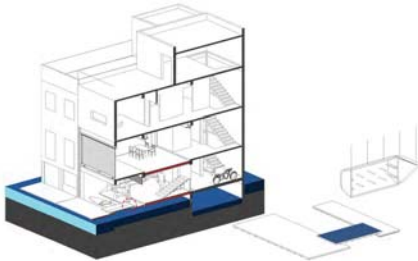
The scooter was parked under the porch
I rummaged through the hull for a repair tool
Busy and fulfilling life

1 : 300 Hw=0.3m



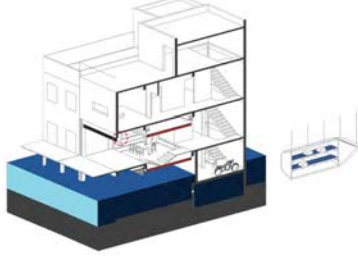
Suddenly rain cats and dogs
Make a temporary ramp
Push the bike to the back room

1 : 300 Hw=0.8m



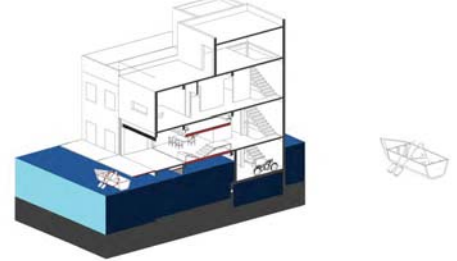
The water level rises
Awning become doorways
The water scooter repair shop has opened

1 : 300 Hw=2.0m



Listening to the sound of water
Watching the flow of water
The boundary between the city and nature becomes blurred

1 : 300 Hw≥3.0m



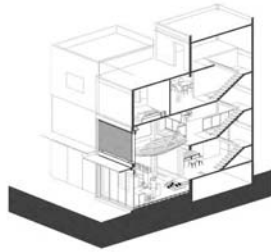
The rain shows no sign of stopping
The cabinet turns into a boat
I leave by boat

STATIONERY STORE

Have a pleasant rest
Children's secret garden
Reading in nature

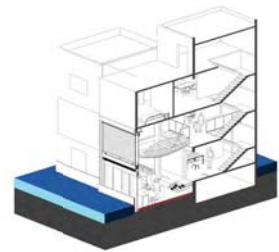


1 : 300 Hw=0.0m



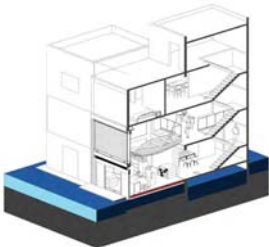
I am adjusting the height of awning
The children take off the hanging comic books
Boarding the sky boat
which was their secret garden

1 : 300 Hw=0.3m



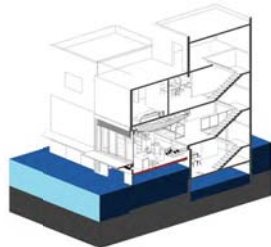
Suddenly raining cats and dogs
Awning flips
Be the first defense

1 : 300 Hw=0.8m



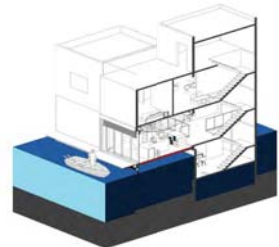
The water level rises
Awning become doorways
Lift the floor
Flood can be used by families

1 : 300 Hw=2.0m



Listening to the sound of water
Watching the flow of water
The boundary between the city and nature becomes blurred

1 : 300 Hw=3.0m



The "sky" turns into a pier
No one will come
I leave by boat

STATIONERY STORE MODEL



Hw=0.0m



Hw=0.8m

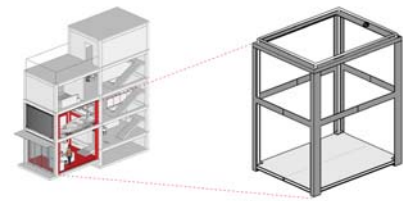
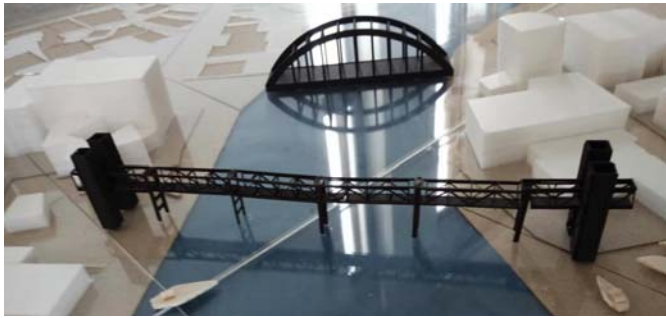


Hw=2.0m

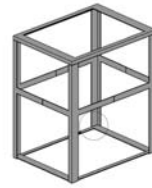


Hw=3.0m

DETAILS

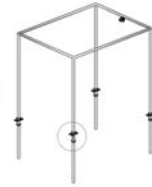


Support Structure



L-steel as Corner Columns

Transmission Facilities



Fixing Cover
Leading Screw
Iron Support

Floor(Container Floor)



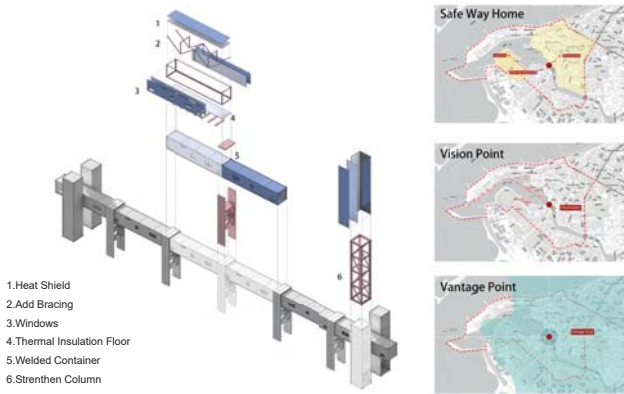
Waterproof Panel
Thermal Insulation Material
C-type Steel

BRIDGE

Safe way to go home
 Overlook with expectation
 Vantage point during flood



Bridge structure

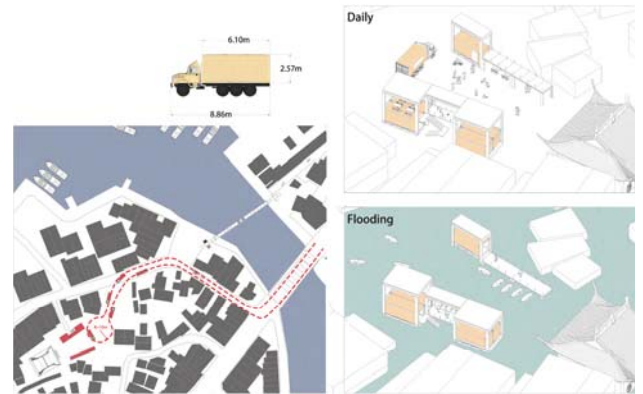


SQUARE OF TEMPLE

Lively space for religious activities
 Temporary medical place
 Heal the wounded and rescue the dying during flood



Turning radius



Supplementary Design



Regenerative Earth and Anthropocene Design I

Taichung Railway Station to Eastern District
Supplementary Design
M.Arch II, Program C(2018)
Advisor: Kuowei Chiu

This design project started in September. After two months work, we analyzed the rear Taichung railway station which is in the eastern district. And we found that the whole area on the rear railway station has no pedestrian friendly design. Almost every historical place (mostly from Chinese history) are blocked. Walking to the Han river, people can't stand up, when they feel about the water environment, and all the biosphere is so far away from humans. Including these situations, an urban design team should go into this place immediately and do the regenerative urbanism for the future, accurately for 2050.

So our group digs out all the significant issues in this place and gives out our proposals for the future strategy plan.



SDGs

1. NO POVERTY
Disaster risk reduction is essential to ending poverty and fostering sustainable development;

The exposure of people and assets to natural hazards is increasing at a faster pace than that at which risk-reducing capacities are being strengthened, leading to increased disaster risk;

By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events.

3. GOOD HEALTH AND WELL-BEING FOR PEOPLE
Reduce death rate due to road traffic injuries.

6.CLEAN WATER AND SANITATION
By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands,rivers, aquifers and lakes.

9. REDUCING INEQUALITIES
Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.

RESILIENT CITIES
DISASTERS
The measurable ability of any urban system, with its inhabitants, to maintain continuity through all shocks and stresses, while positively adapting and transforming toward sustainability

SIGNIFICANT ISSUES
DISASTERS
1.Inequality of resistance to flooding

SOCIETY
1.There are no sufficient safety and healthy places for public
2.There is no affordable and equitable access for food



SDGs

7. AFFORDABLE AND CLEAN ENERGY
Find an alternative energy.

13. CLIMATE ACTION
To hold warming to below 1.5°C and reduce greenhouse gas emissions. Improving corporate awareness by measuring and disclosing environmental impact is essential to the management of carbon and climate risk.

14. LIFE BELOW WATER
Recover the water biosphere.

15.LIFE ON LAND
Recover the land biosphere.

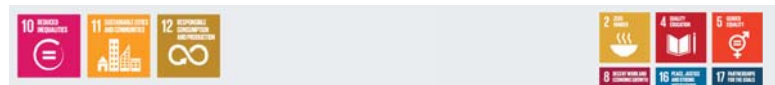
PARIS AGREEMENT
To keep global temperatures well below 2.0C (3.6F) above pre-industrial times and endeavour to limit, them even more, to 1.5C

To limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil and oceans can absorb naturally, beginning at some point between 2050 and 2100

PLANETARY BOUNDARIES
Loss of biosphere integrity (biodiversity loss and extinctions)

Land system change:Land is converted to human use all over the planet. Forests, grasslands, wetlands and other vegetation types have primarily been converted to agricultural land. This land-use change is one driving force behind the serious reductions in biodiversity, and it has impacts on water flows and on the biogeochemical cycling of carbon, nitrogen and phosphorus and other important elements.

SIGNIFICANT ISSUES
ENVIRONMENT PROTECTION
1.The green infrastructure is not in good quality and quantity
2.Land surface temperature and factories distribution shows positive correlation
3.Biosphere integrity is not completed



SDGs

10. REDUCING INEQUALITIES
Narrowing the gap between well-developed people and unequally-developed peoples, especially at the infrastructure, education and medical level.

11.SUSTAINABLE CITIES AND COMMUNITIES
By 2030, ensure access for all to adequate, safe, and affordable housing and basic services and upgrade slums.

By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.

Strengthen efforts to protect and safeguard the world's cultural and natural heritage.

By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.

Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials.

12. RESPONSIBLE CONSUMPTION AND PRODUCTION
Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.

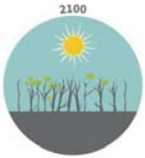



CIRCULAR ECONOMY
1. Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows resolve levers: regenerate, virtualise, exchange.
2. Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles resolve levers: regenerate, share, optimise, loop.
3. Foster system effectiveness by revealing and designing out negative externalities all resolve levers.




SIGNIFICANT ISSUES
HISTORY
1. Lost the subjectivity of human being;
2. Historical spaces are not turned into a good open space;
3. Unbalanced development in history;

TRANSPORTATION
1. Public space lacks of good accessibility;
2. Streets are not designed for pedestrian and public transportation and therefore failure of reducing the carbon emissions;
3. Roads are not having a good resistibility (inequalities of abilities of resisting the disasters)

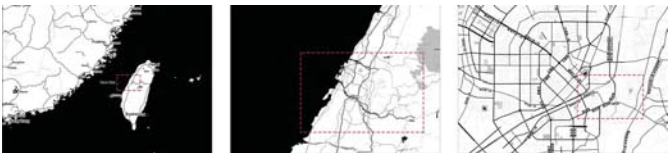
SOCIETY
1. Circular economy are not developed;
2. The imbalance of regional development

KEY POINTS OF THE PARIS CLIMATE AGREEMENT

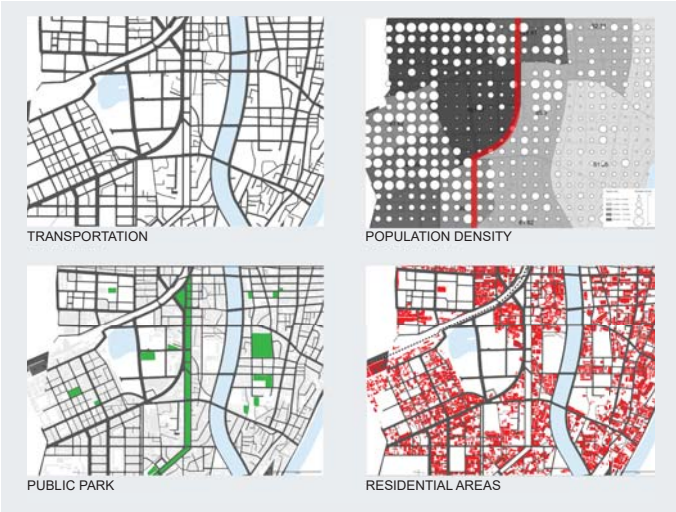
Temperatures	Financing	Specialisation	Emissions goals
 <ul style="list-style-type: none"> • Keep warming "well below 2 degrees Celsius" • Continue efforts to limit the rise in temperatures to 1.5 degrees Celsius" 	 <ul style="list-style-type: none"> • Rich countries must provide 100 billion dollars from 2020, as a "floor" • Amount to be updated by 2025 	 <ul style="list-style-type: none"> • Developed countries must continue to "take the lead" in the reduction of greenhouse gases • Developing nations are encouraged to "enhance their efforts" and move over time to cuts 	 <ul style="list-style-type: none"> • Aim for greenhouse gases emissions to peak "as soon as possible" • From 2050: rapid reductions to achieve a balance between emissions from human activity and the amount that can be captured by "sinks"

Burden sharing	Review mechanism	Climate-related losses
 <ul style="list-style-type: none"> • Developed countries must provide financial resources to help developing countries • Other countries are invited to provide support on a voluntary basis 	 <ul style="list-style-type: none"> • A review every five years. First mandatory world review: 2025 • Each review will show an improvement compared with the previous period 	 <ul style="list-style-type: none"> • Vulnerable countries have won recognition of the need for "averting, minimising and addressing" losses suffered due to climate change

SITE LOCATION



SITE ANALYZATION



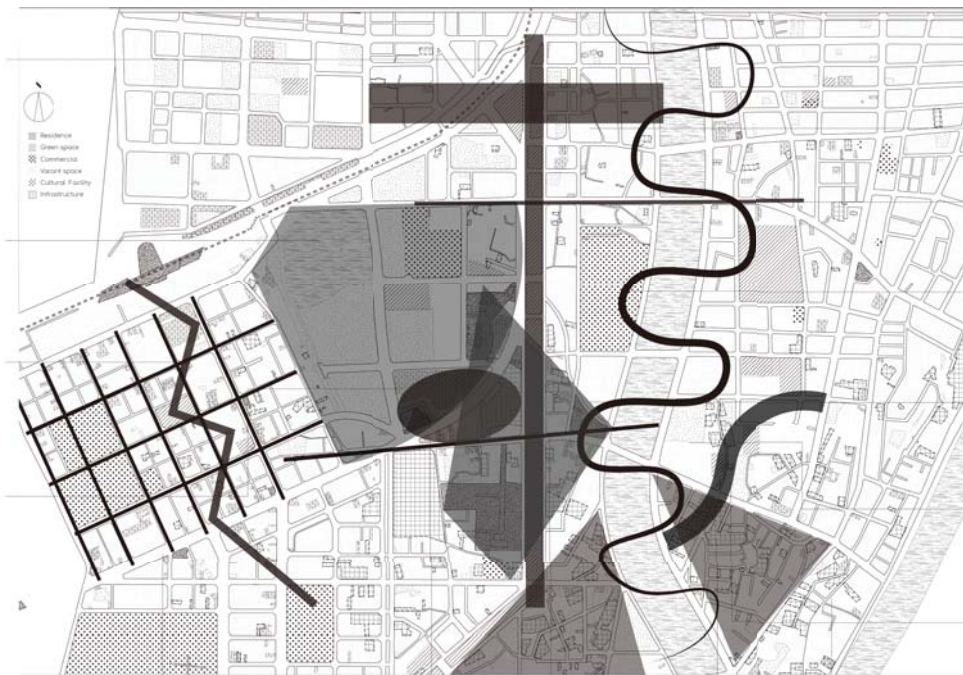
SITE ANALYSIS MAP

FORMER RAILWAY TRACK
It be used as an access point of the front and back of railway station;
It can be used as a worship path from city to the Lecheng Temple

BIOLOGICAL PARK
It has great potential to become a place with strong water storage capacity, abundant spatial experiences and good habitat.

THE CROSS AXIS
Tianwailian Theater, Taichung Old Station and Zhongxiao Night Market can be emphasized by creating a view corridor and walking system to create historical and cultural axis;
Making connection between alcohol factory and sugar factory

JIANGUO MARKET
Jianguo market, Zhongxiao market and Han river morning and night market can be connected by friendly walking path;
Making connection with local factory can be a part of the whole chain of circular economy



DEFINED INEQUALITY EDGES
This area needs a design solution to reduce the inequality of the development condition and resistance to flooding inside and outside by strengthening ties between them

THE FORMER QING DYNASTY EASTERN GATE
The former Qing Dynasty eastern gate has been ruined. But for memorial of the Chinese traditional culture, the place of eastern gate can be designed into a square

GREEN AXIS
It can be used as food supply farm and locals can cultivate its own food in eastern district to face the land-use change

TRAFFIC NETWORK
Opportunity to connect the transportation network between both bank

INDUSTRIAL VILLAGE
Scattered factories can be regenerative industries combined with neighbor biomass producer.

ENCLOSED AND INTROVERTED TRIANGULAR URBAN GRID
Crowded and introverted urban space can be converted into open space

SOFT GREEN LINE
To reconnect river and people. Soft water bank and pedestrian walk can be made, even to be a River ecological education field.

MEMORIAL VILLAGE
Lecheng temple can be used as an open space

CROSS RIVER ROAD
The riverside's greenland of east bank and west bank can be connected by a bridge to enhance biodiversity

BIOLOGICAL SCHOOL
In the context of 2050, school can play other roles besides the educational function; even a possibility to build an educational field for river ecological education.

MAIN INFRASTRUCTURE
The security of critical infrastructure should be strengthened to ensure they can operation during disasters.

HAN RIVER NIGHT MARKET
The vacant space during the day can be effectively utilized to become an active place for activities as well as a place for water storage

POCKET PARK
People can cultivate their own food in eastern district to face the land-use change

SIGNIFICANT ISSUES

HISTORY: HISTORICAL SPACES ARE NOT TURNED INTO A GOOD OPEN SPACE & UNBALANCED DEVELOPMENT IN HISTORY



HISTORY: HISTORICAL SPACES ARE NOT TURNED INTO A GOOD OPEN SPACE & UNBALANCED DEVELOPMENT IN HISTORY



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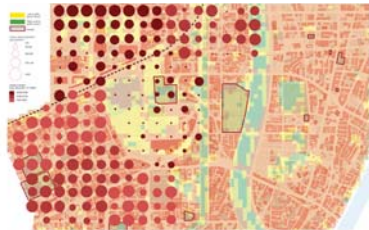
SOCIETY: CIRCULAR ECONOMY ARE NOT DEVELOPED



SOCIETY: CIRCULAR ECONOMY ARE NOT DEVELOPED



SOCIETY: THERE IS NO SUFFICIENT SAFETY AND HEALTHY PLACES



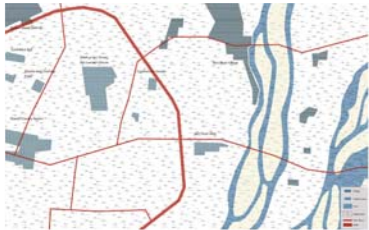
THE GREEN INFRASTRUCTURE IS NOT IN GOOD QUALITY AND QUANTITY

TRANSPORTATION: PUBLIC SPACE LACKS OF GOOD ACCESSIBILITY & STREETS ARE NOT DESIGNED PEDESTRIAN AND PUBLIC TRANSPORTATION AND THEREFORE FAILURE OF REDUCE THE CARBON EMISSION



SIGNIFICANT ISSUES

SOCIETY: THE IMBALANCE OF REGIONAL DEVELOPMENT DISASTERS: INEQUALITY OF RESISTANCE TO FLOODING



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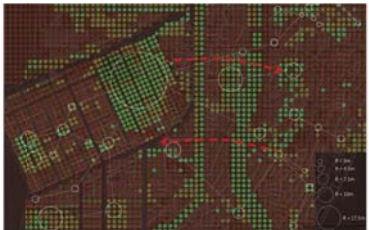
SOCIETY: THE IMBALANCE OF REGIONAL DEVELOPMENT DISASTERS: INEQUALITY OF RESISTANCE TO FLOODING



DISASTERS: RISK OF SIGNIFICANT INFRASTRUCTURE



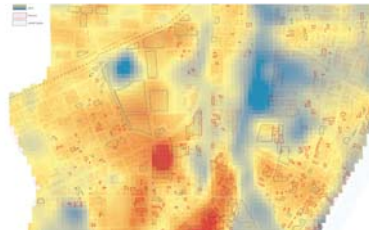
ENVIRONMENT: BIOSPHERE INTEGRITY IS NOT COMPLETE



ENVIRONMENT: THE GREEN INFRASTRUCTURE



ENVIRONMENT: LAND SURFACE TEMPERATURE AND FACTORIES DISTRIBUTION SHOWS POSITIVE CORRELATION



STRUCTURE PLAN



MEMORIAL VILLAGE PRECINCT
Nearby blocks are emphasized by the worship path to Lecheng temple.



PASSENGER TERMINAL PRECINCT
Passenger terminal brought the tourists into eastern district.



MIXED-USE BLOCKS PRECINCT
Mixed-use blocks have residential buildings, commercial area and public spaces and civic culture center.



RIVERFRONT PRECINCT
Use the riverfront area as open space with a large quantity of natural resources. As the same time, two schools near the river can use these spaces as a natural environment protection education base.



THE EASTERN GATE SQUARE
The eastern gate square can become both a green land and a place to remember the Chinese tradition culture.



THE THIRD TYPE RESIDENTIAL PRECINCT
The third type residential area at the city edge combine with apartments and factories.



HISTORY

THE DESIGN OBJECTIVES ARE:
To reproduce multiple levels, different eras and equal historical memories of Taichung people, to reconstruct the Eastern Gate as a "Urban Gateway", while providing high quality open spaces for the public.
THE DESIGN IMPLICATIONS OF THESE OBJECTIVES INCLUDE:
Link up these historical spaces organically according to the characteristics of historical buildings by creating cross axis. And create the atmosphere of different periods by using relevant historical or architectural elements.

ENVIRONMENT PROTECTION

THE DESIGN OBJECTIVES ARE:
To conserve biological diversity by creating habitats, to reduce carbon emissions, to encourage circular economy development and the use of sustainable energy.
THE DESIGN IMPLICATIONS OF THESE OBJECTIVES INCLUDE:
Building an ecological corridor between both sides of Han River and provide people with alternative and sustainable modes of travel such as walking and cycling.

DISASTERS

THE DESIGN OBJECTIVES ARE:
To improve the regional resilience to disasters, especially floods, to ensure the normal operation of infrastructures and food supply facing disasters.
THE DESIGN IMPLICATIONS OF THESE OBJECTIVES INCLUDE:
Increase green space and integrate existing green space system, improve its storage capacity (especially along the banks of Han River), while enhancing the security of infrastructure.

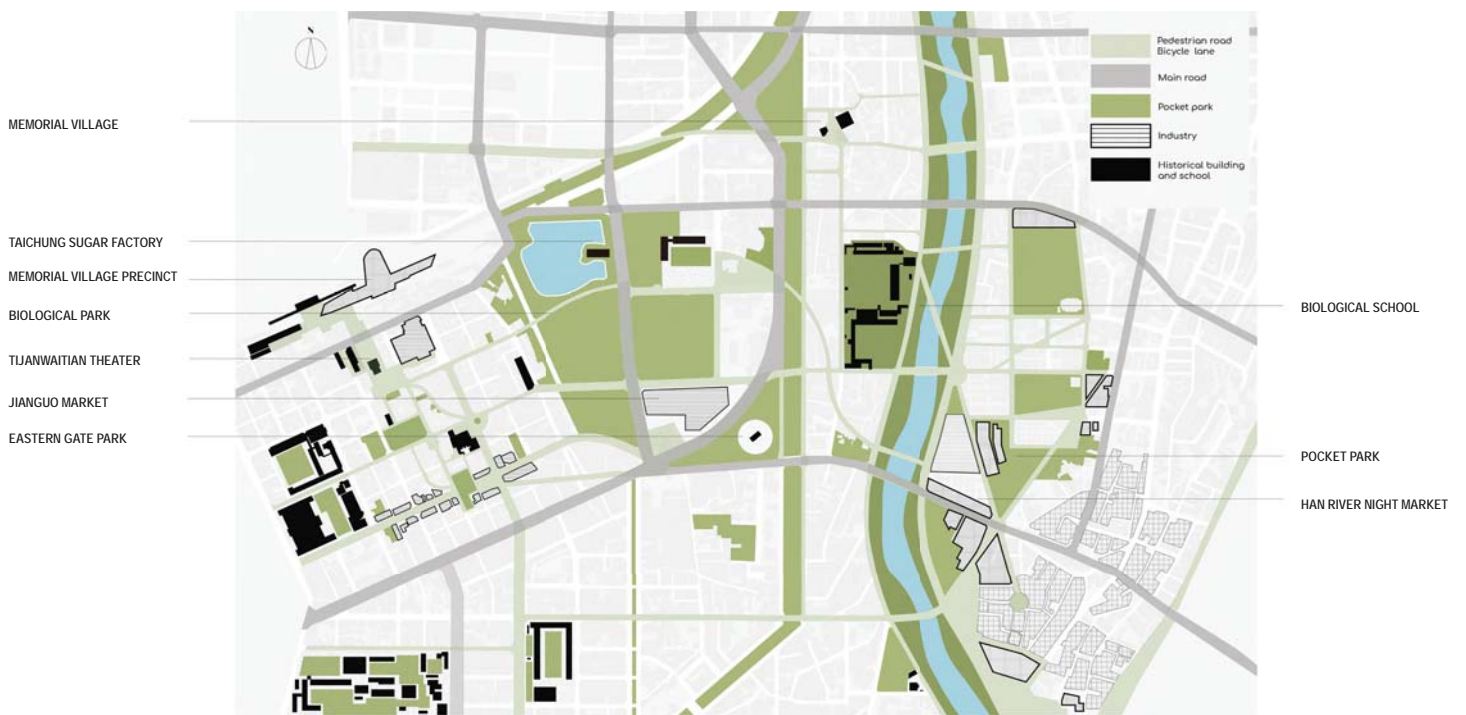
SOCIETY

THE DESIGN OBJECTIVES ARE:
To eliminate the inequality between regions, to give more help to social vulnerable groups to safeguard social fairness and justice.
THE DESIGN IMPLICATIONS OF THESE OBJECTIVES INCLUDE:
Build convenient and efficient public transportation system, improve street conditions and set up special lanes for walking and cycling. Eliminate the unequal border (Jiancheng road) by floods control and other disasters.

TRANSPORTATION

THE DESIGN OBJECTIVES ARE:
To provide more convenient, safe and clean means of transportation, to build a walking system and reduce environmental pollution.
THE DESIGN IMPLICATIONS OF THESE OBJECTIVES INCLUDE:
Establish a pedestrian system to connect historic buildings, markets and green open spaces. Building squares as a traffic node for pedestrian, cycling and public transportation. Create more access points to enter public space and also improve the quality of it.

STRATEGY PLAN



DESIGN RESPONSE

- The cross axis in the rear railway station area lead the tourists from the railway station which on the north to the Zhongxiao market which is on the south. And the east-west side cross here also lead the way to the former sugar factory and the former brewery.
- Make Jianguo Market to have Qing dynasty's pattern. To bring back the Ching dynasty's historical memories.
- A road from railway to Lecheng Temple and terminal along the waterfront
- Use the existing water pool around the former sugar factory to make a water environment prevention park.
- Use the green lands near the former sugar factory to build into a resilient public park, and provide a habitat suitable for living creatures, especially birds.
- Open up the alley of the rear railway station to get more accessible roads and more place to stay.
- Increase the diversity and hierarchy of plants, and use different plants to form rich sightseeing space.
- The ground pavement of the Han river night market was changed into permeable pavement to facilitate water seepage and reduce the surface temperature in daytime.
- Renovate the site of Han river night market so that it can meet the needs of some daytime activities.
- A biological campus (Yulin middle school and Chengkung primary school) to do river-friendly education.
- A pocket park provides the nearby village accessible open space.
- Materials recycling industries reduce pollution and waste of resources.
- Riverside pedestrian walk to connect neighbor open spaces such as night market and campus.
- A pedestrian bridge link nightmarket and campus.

EASTERN GATE PARK DESIGN

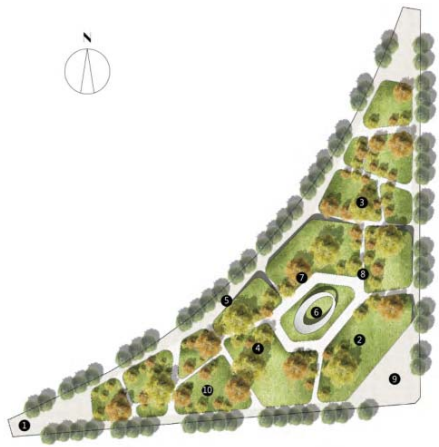
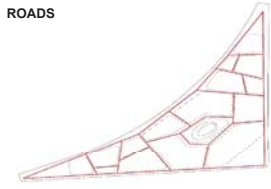
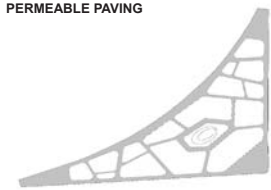
HISTORY
 In the Qing Dynasty, there was an important gate, "Main Eastern Gate", in the area. But it has gradually been forgotten. So we try to combine traditional Chinese(the Qing Dynasty) elements with modern objects to maintain traditional features while is also functioning. We want to create a traditional atmosphere, where people can retrieve that memory, to show the historical diversity.

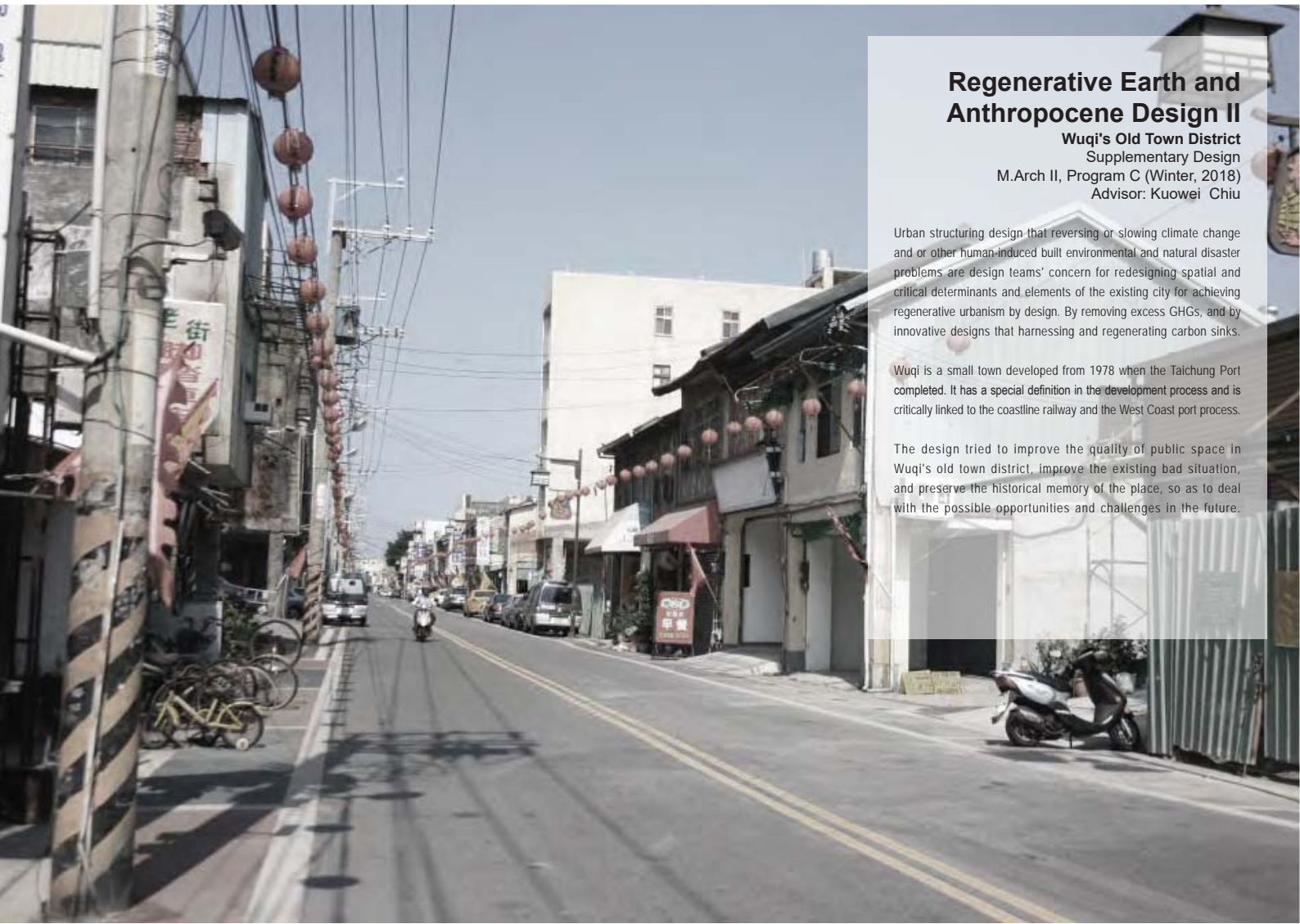
ENVIROMENTAL PROTECTION
 The green infrastructure here is not in good quality and quantity, at the same time, the biosphere integrity is not completed. So as a key hub, the area is critical in connecting the lateral green axis. We plant different vegetation to "seek" carbon and reduce greenhouse gases. At the same time, we also choose plants based on the habits of local species in order to provide good habitats for living things to enhance biodiversity.

DISASTERS
 The region's ability to withstand floods is poor, but it has great potential to coexist with water. The landform acts as an above-ground infrastructure core that minimizes disturbance to existing root systems and houses a storm water cistern, bathrooms, and utility room. And we try to increase the soil area to control surface runoff and reduce the threat of flood disasters. If necessary, it can also be C a temporary shelter.

SOCIETY
 There are no sufficient safe and healthy places for public. We have created a lot of interesting activity spaces to meet the needs of different people. We use different plants and light structures to create an open, safe, free and healthy place for the public, and invite citizens to occupy the Square and enjoy the richness of urban life. That must be helpful to reduce the inequality among people.

TRANSPORTATION
 Streets are not designed for pedestrian and public transportation and therefore failure of reducing the carbon emission. We provide a variety of path choices and plant collocations, so that it would make walking and cycling people feel safe and funny. At the same time, the three squares can also serve as a traffic island refuges, which can reduce traffic accidents effectively.





Regenerative Earth and Anthropocene Design II

Wuqi's Old Town District
Supplementary Design
M.Arch II, Program C (Winter, 2018)
Advisor: Kuowei Chiu

Urban structuring design that reversing or slowing climate change and or other human-induced built environmental and natural disaster problems are design teams' concern for redesigning spatial and critical determinants and elements of the existing city for achieving regenerative urbanism by design. By removing excess GHGs, and by innovative designs that harnessing and regenerating carbon sinks.

Wuqi is a small town developed from 1978 when the Taichung Port completed. It has a special definition in the development process and is critically linked to the coastline railway and the West Coast port process.

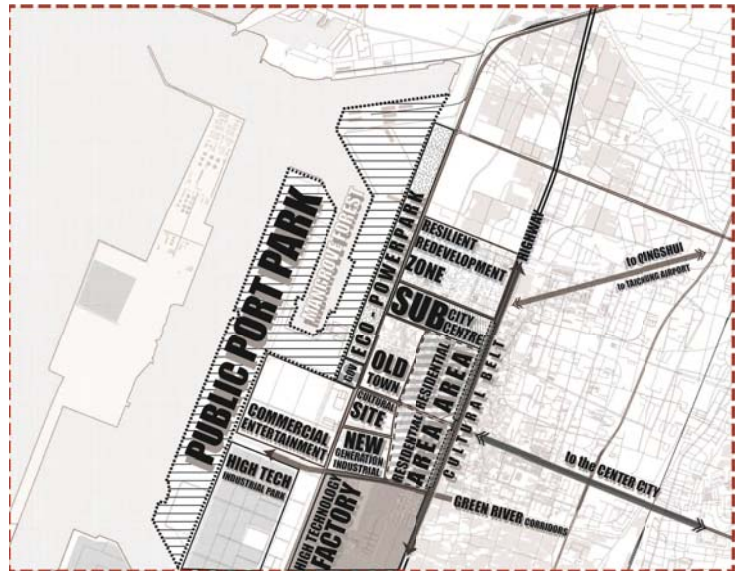
The design tried to improve the quality of public space in Wuqi's old town district, improve the existing bad situation, and preserve the historical memory of the place, so as to deal with the possible opportunities and challenges in the future.

FUNCTIONAL PARTITION

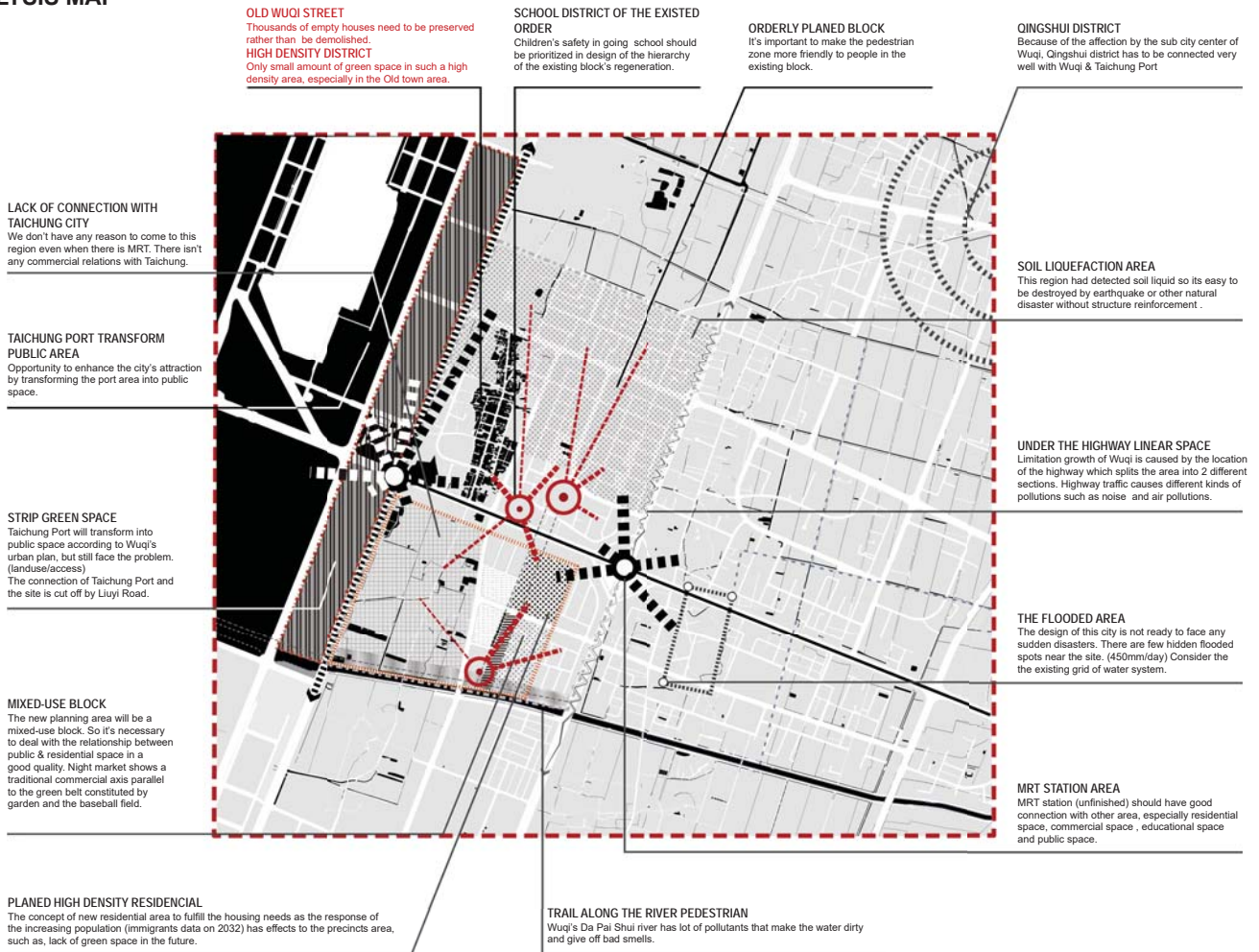
Functional partition present plan



Functional partition plan for 2050



SITE ANALYSIS MAP



STRATEGY PLAN

PRECINCT FOR ECO-POWER PARK
Main axis for pedestrians to go through the old street. Vertical green corridors to lead the people to the eco-park. Maintain the typology and morphology of the street-lane relationship and figure-ground to preserve the collective memory. Small pocket of green spaces interconnected by green corridors adapted from existing lanes.

OLD TOWN AREA PRECINCT
Main axis for pedestrians to go through the old street. Vertical green corridors to lead the people to the eco-park. Maintain the typology and morphology of the street-lane relationship and figure-ground to preserve the collective memory. Small pocket of green spaces interconnected by green corridors adapted from existing lanes.

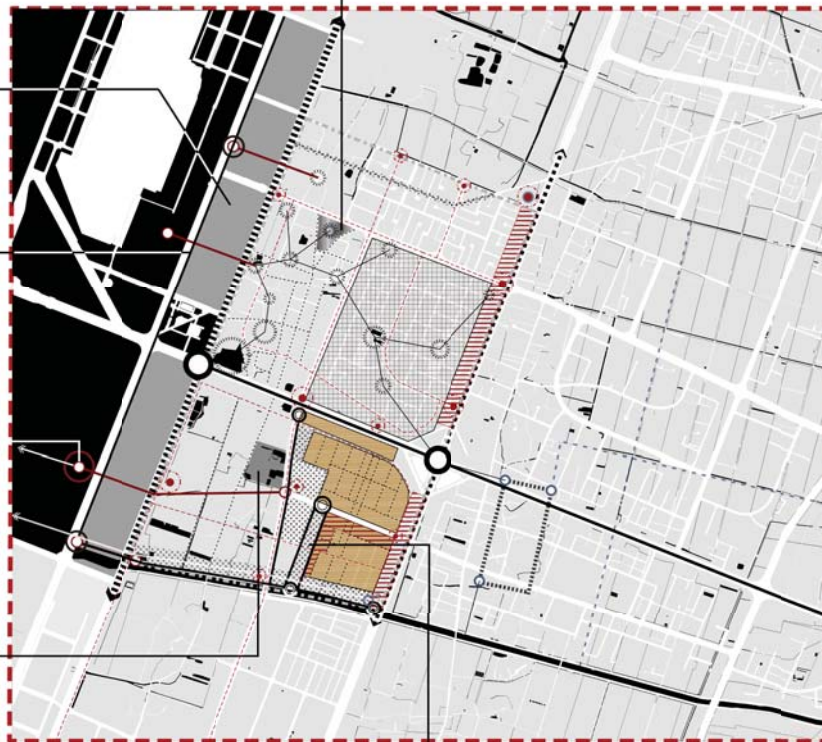
SPONGE BLOCK & FUTURE RESIDENTIAL PRECINCT
A great landscape in such a high density residential area can preserve a public green space for the citizen. An axis points residential & the river.

CBD AREA PRECINCT

Urban regeneration plan for the CBD area, including existing blocks and old houses. Lots of abandoned space, over-parking space, green space no longer be used. The future sub center city needs to fully consider the connection with Qingshui, let the AoFeng Rd. green belt link into the CBD area. It is necessary to make full use of the green space in the west and enhance the connection with the port area.

HIGH DENSITY HOUSING PRECINCT

This area will have more green space especially in the high density residential, those green space will located on the existing road between each house. Upgrading the road system to support the elderly needs in order to access another place easier. Improve the function of the city centre intersection, which links all the important point on the centre of this area (such as public space, school, etc). Create the highway area become pedestrian friendly by building a cultural belt along under the highway.



ECO-PARK 01

The function of park is not only for entertainment also being a respite place in a high density block. And it can be an all-age friendly space.

PUBLIC AXIS 02

The tapozov plaza links to the CBD area. And also a water hub is connected to CBD area for transferring and solving water problem.

QINGSHUI & TAICHUNG AIRPORT LINK 03

Government has a plan to make WUQI as a sub city center, so its important to strengthen the connection between QINGSHUI and this area. We set up a forest for block out the season wind and entertainment.

ECO ENERGY PARK 04

The four energy park is friendly for ecology not only because of the turbines also there will be bioswales setting in this park.

SELF-DRIVING VEHICLE ROAD 05

There will be unmanned taxi in the future. We set up the road direction will surround all the area, so it can solve the problem about distributed. If we can't satisfy every compact block.

CORRIDOR OF THE PORT PARK 06

Create a long corridor through the port, which would follow the park (green axis). Also provide an great access from the CBD area to the Outlet commercial area.

THE CULTURAL BELT 07

A linear space of the under the highway will become a culture & commercial & activity space. By using half of the under bridge way build a culture, wish Wuqi can take control of the main road, and turn it into public-human friendly space.

OUTLET COMMERCIAL 08

Taichung Port Outlet commercial area is connected to the boulevard, which starts from the culture belt.

FLOOD AREA DESIGN 09

Several flood ponds will be built at the place which is facing the problem about the flood, and the connection with the eco-parking is the emphasis.

MUSEUM PROJECT 10

At the intersection of the two axis (Ocean axis & Public corridor) Make the public & culture closely related.

GREEN RIVER CORRIDOR 11

A linear space under the highway will become a Culture & Commercial & Activity space. Using half of the space under the bridge way is a symbol of Wuqi and it will take control of the main road in the future. At that time, Wuqi will become a public-human-friendly space.

RESIDENTIAL PROJECT'S SQUARE 12

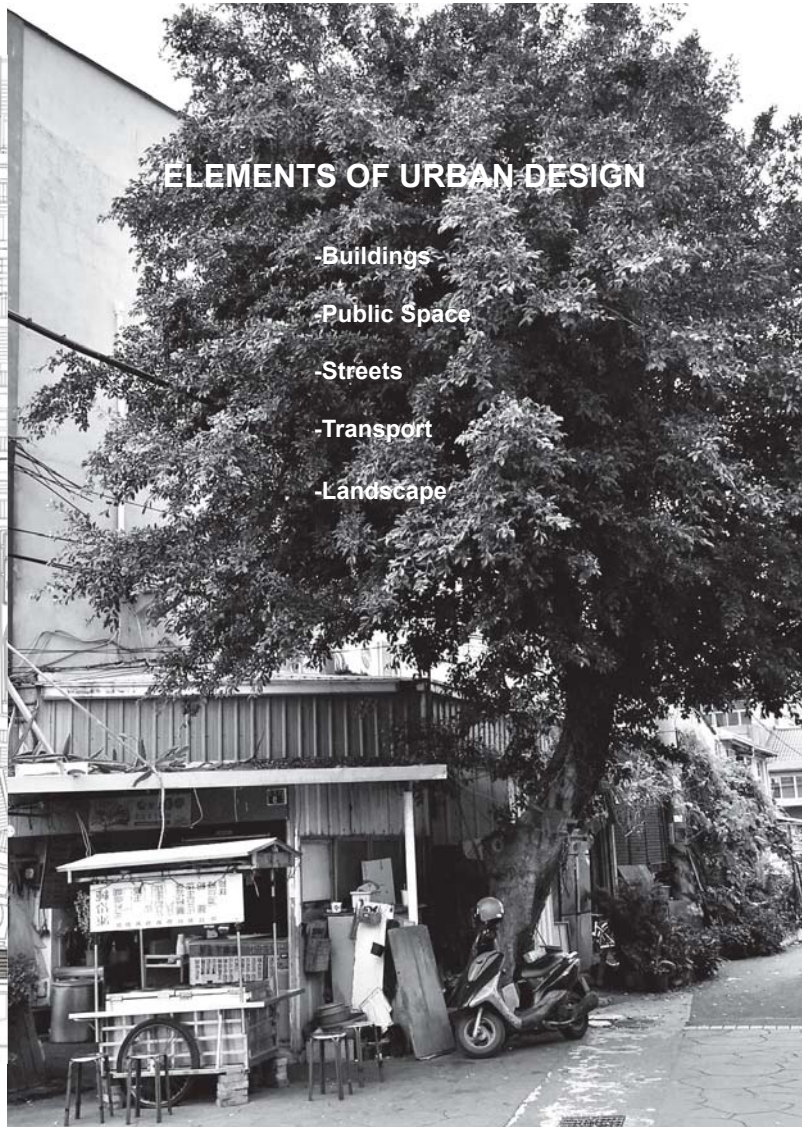
A great landscape in such a high density residential area can preserve a public green space for the citizen. An axis points residential & the river.

SITE PLANNING



ELEMENTS OF URBAN DESIGN

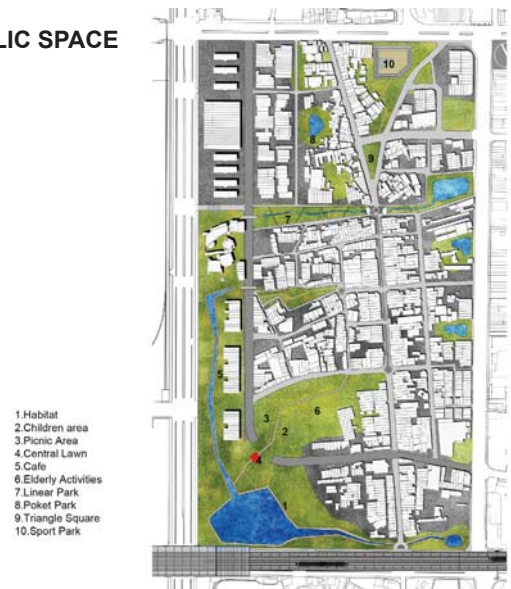
- Buildings
- Public Space
- Streets
- Transport
- Landscape



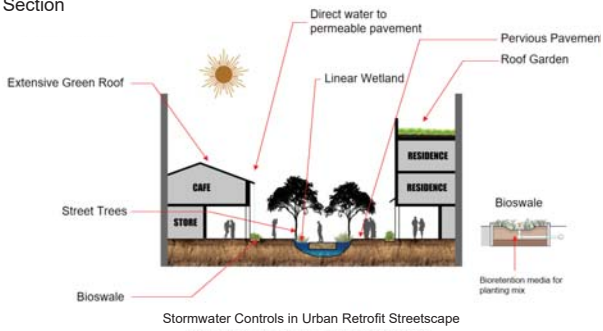
BUILDING



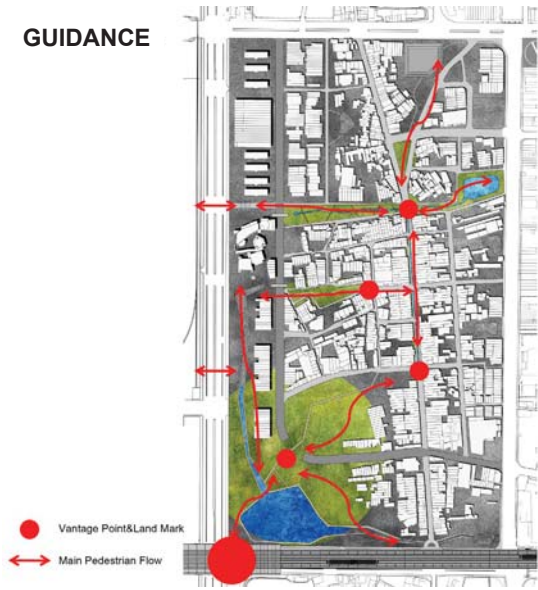
PUBLIC SPACE



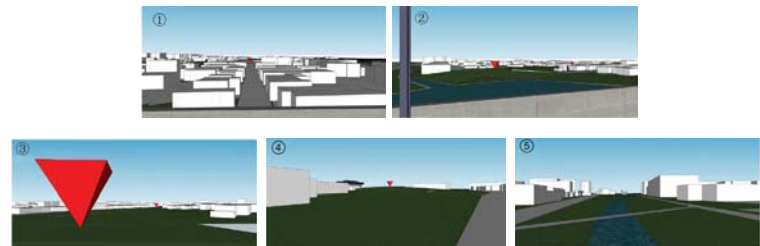
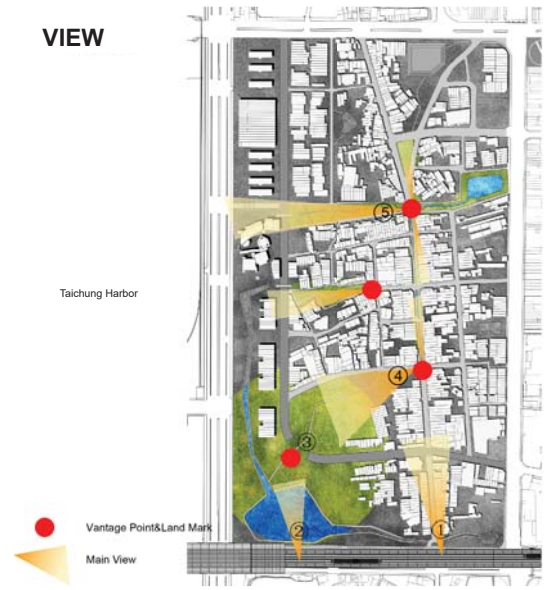
Section



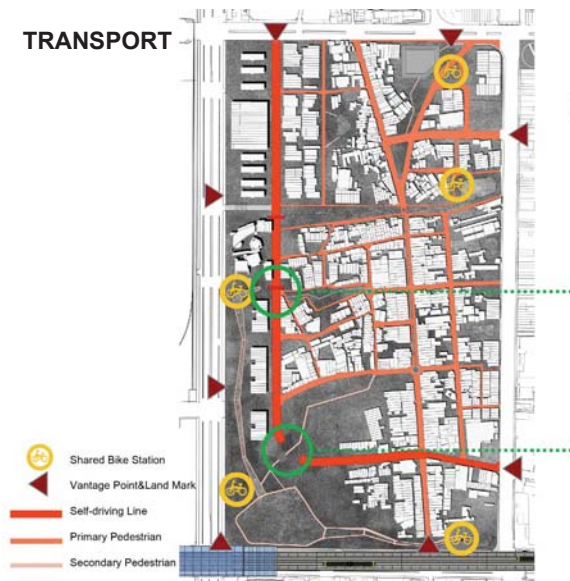
GUIDANCE



VIEW



TRANSPORT



LADNSCAPE



Pocket Park



Bioswale



Rain Garden



Ecological Park



Sport Park



Linear Park



Ecological Street



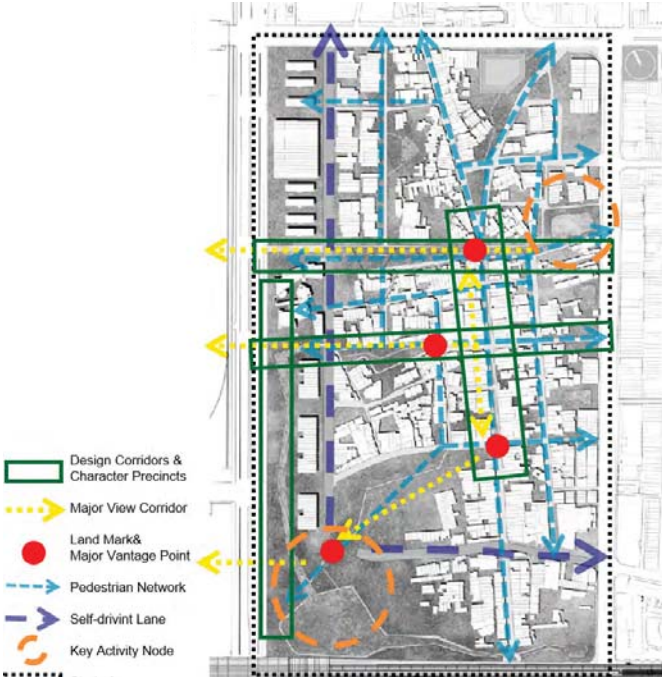
Detention Pond(Dry)



NDVI MAP
The normalized difference vegetation index (NDVI) is a simple graphical indicator that can be used to analyze remote sensing measurements, from a space platform, and assess whether the target being observed contains live green vegetation or not.



FRAMWORK & PLAN



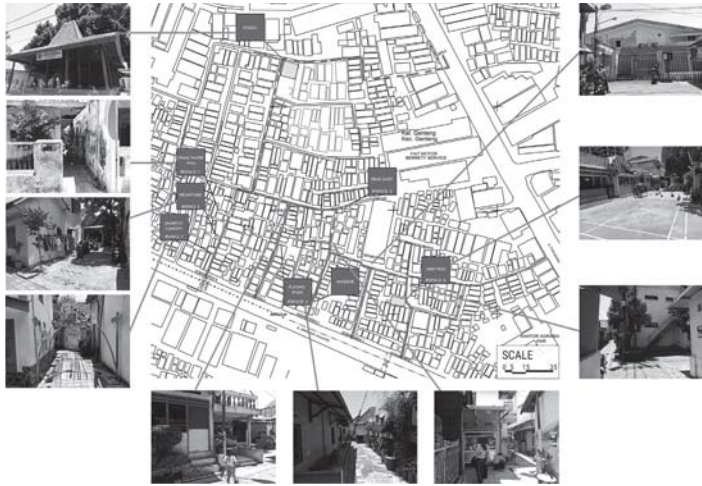


Fluidity in Everyday Urbanism

Supplementary Design
6th Platform For Asia Architecture & Urbanism
(11-15 Oct. 2018)
Advisor: Kuowei Chiu

Spatial negotiation, mobility, ephemerality is common in Asian cities. This ambiguity is a part of a fluid identity of its everyday urbanism. People have always been the steroid of the Asian cities growing, sprawling, congesting and contesting every day. Based on this reality, Asians have always been good storytellers. Storytelling is a living culture in Asia, and the media varies from oral to literature and performing art. Damar Kurung is a form of this storytelling culture that tells the fluidity of the everyday life via a kind of banal lampion art that is creatively expressed in a simple vernacular stuff of the everyday people. This 6th edition of PAUU workshop meant to provoke the creativity, discussion and knowledge sharing amongst the participants, learning from Damar Kurung.

KAMPUNG KEBANGSREN & KETANDAN MAP



Kampung Ketandan, which was called Ketandang, is one of the oldest kampung in Surabaya. It was built in the Majapahit Kingdom era as the meeting point of the military soldiers who fight the Mongolian. A historical tomb for Mbah Buyut Tondo was built in the Majapahit Kingdom era. Another historical building is the mosque that was built in the colonial period. People from Kampung Ketandan also took part in the fight for Indonesia's independence.

The location of Kampung Ketandan is economically strategic due to its vicinity to Surabaya's central business district. This area was continually under the threat of gentrification during the Indonesia's New Order era, especially during the 90s.

We find that these streets lack of good public space. The scale of street space is suitable for people, but it will lead to some congestion and danger because some motorcycles and mobile shops take up some space. Therefore, the street space needs some flexibility to meet different living needs.

TRADITIONAL ELEMENT DAMAR KURUNG



The Damar Kurung is a local art that is in the verge of extinction. It is a simple yet fascinating piece that originates from Gresik, East Java, Indonesia. What makes this lantern unique on its own is the fact that each side made to tell a story in terms of design and pattern. It usually depicts memorable and happy events.

The lantern itself is lit with either a lamp or a candle to welcome the nights of Ramadan. It is believed that this is when the night when Allah's blessings and mercy is abundant and sins are forgiven. The lighting of the Damar Kurung resembles the light that Allah has given to his people and the drawings signify the happiness that has been brought during the Ramadan season.

The authentic Damar Kurung has special traits of its own which makes it a signature craft from Gresik. It is shaped as a cube and has decorated sides that could either be made from wax paper or thin canvas. The top has 90-degree triangles that are mirrored on each side that resembles a letter "M". A buffer is also used as legs at the bottom of the lantern.

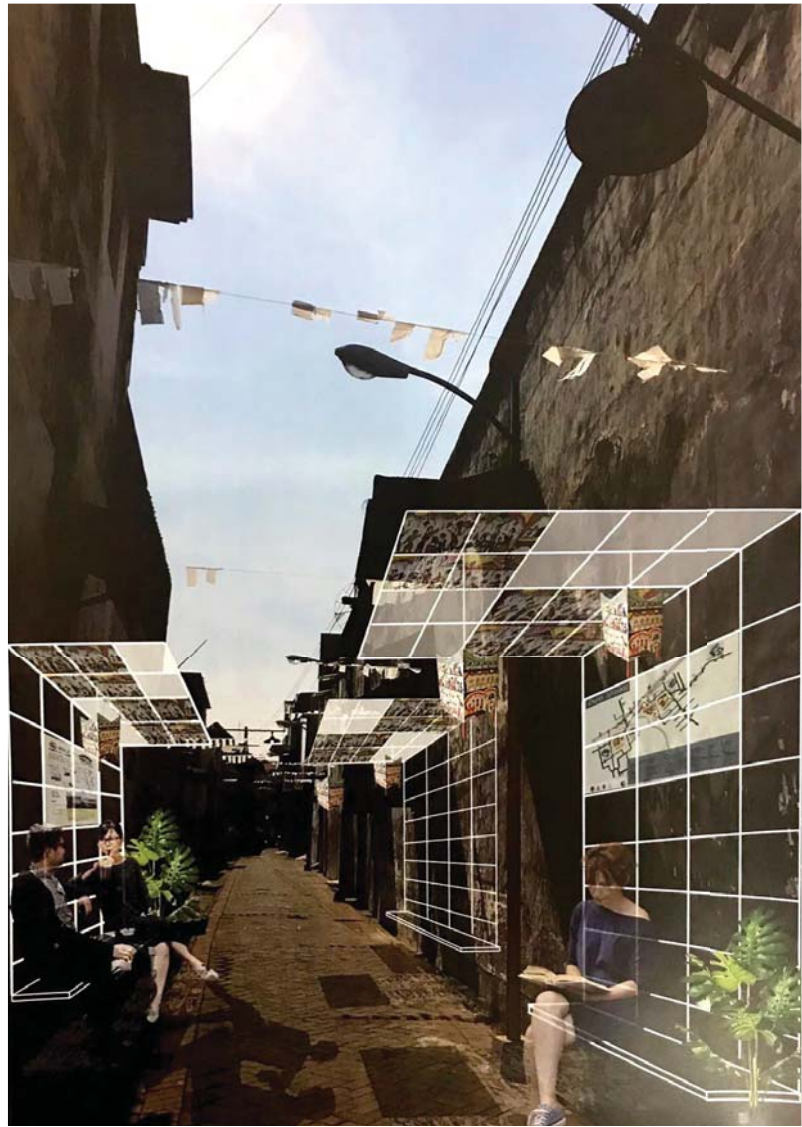
STREET SECTION




DESIGN



We retain the local national symbols through the changes of light and shadow, and the same time, add free space to the blocks. These free spaces can be continuously moved and spliced. They can be combined freely to create a comfortable resting space. Because Kampung is so hot, the idea of shading streets and creating rest spaces will improve the quality of streets.





50.5% population living in urban area now
70% population will live in urban areas in 2050
1,200,000 people died in the earthquake in the 20th. century
\$155 Billion lost in 2018 because of earthquakes
119 earthquakes of magnitude 6 or above

Coexisting with Earthquake

Supplementary Design
Beyond Bauhaus International Competition
(2019)

Advisor: Kuowei Chiu

There are no obvious signs before an earthquake occurs, and strong earthquakes can cause extensive and devastating damage in a short period of time, causing great pain to mankind all over the world. In the future world, people need to learn wisdom about getting along with nature and natural disasters. On this basis, we are trying to invent some creative designs. We use light-weight and high-strength materials as building materials, make efficient use of natural clean energy, carry out a circular economy within the scope, and use sound wave and magnetic field technology to face disasters.

We provide a flexible and convenient space to meet the different needs of the people and good ecological education field to enhance people's awareness of environmental protection. Under the people-oriented empathy design concept, we also fully respect nature and explore sustainable development models.

In the event of an occurring earthquake, this design will not only ensure to minimize its own damage but also hope to give help to the people who are affected.

Our philosophy is inconsistent with Bauhaus's Creative vision, Sustainability and Social Impact. Thanks to Bauhaus, we have the chance to "Thinking the world anew".

GOALS



1. Creative Vision

The project contains a future-oriented core idea articulated in a coherent design concept. We understand design in a fundamental sense, and therefore include concrete objects as well as digital applications.



2. Sustainability

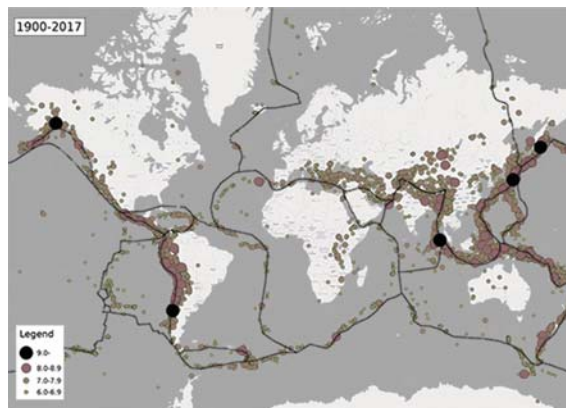
The project offers convincing answers to present and future challenges, particularly with regards to sustainability, resources, opportunities for participation, health, prosperity or intergenerational justice.



3. Social Impact

The project aims to have a specific social impact, i.e. positive effects on individual lifestyles and their ecological ramifications.

ISSUE MAP



ISSUE

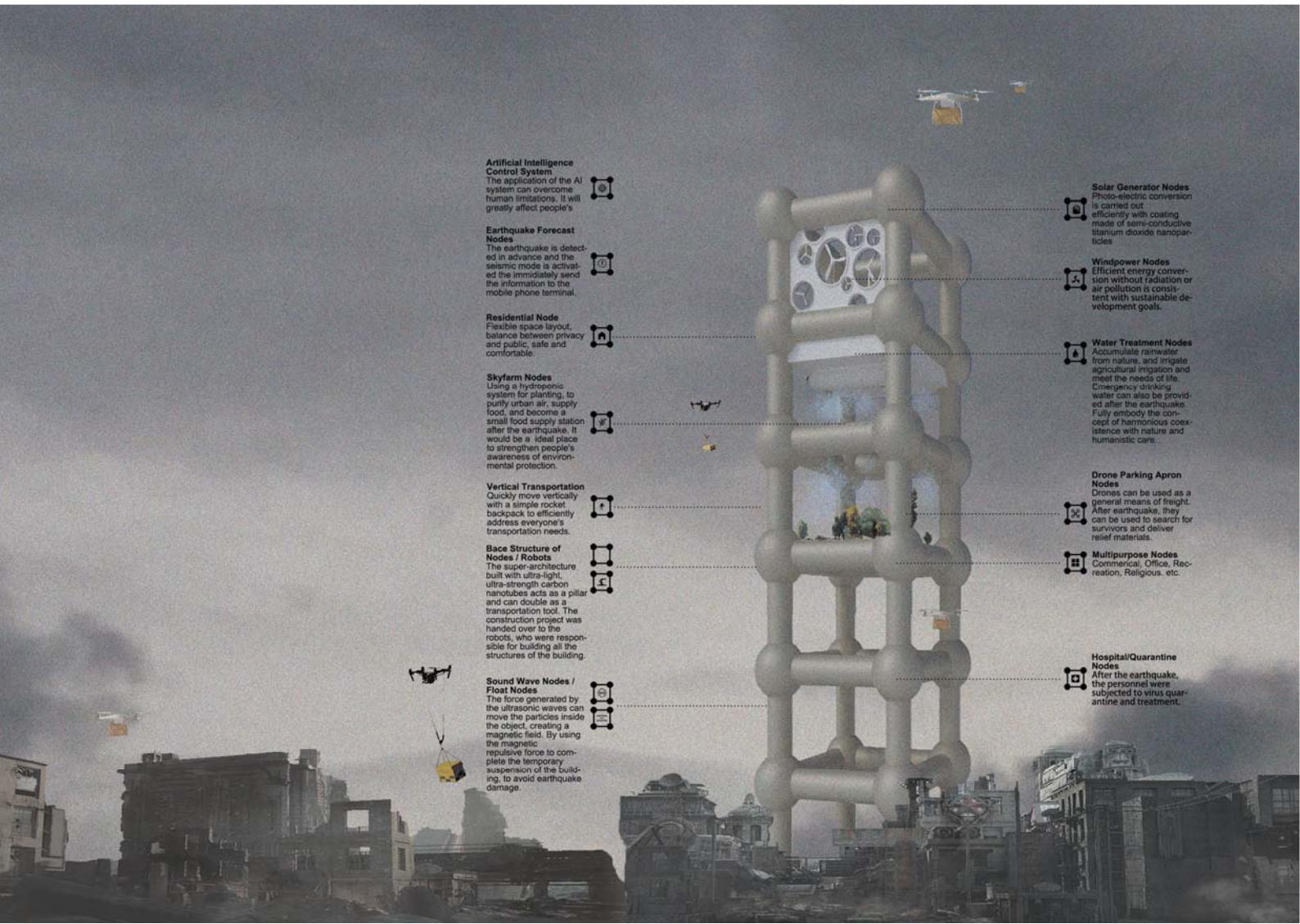
Earthquakes pose inevitable risks to everyone who lives in a seismically active region. Even though the hazard is well recognized, no one knows when an earthquake will strike or how severe it will be.

One of the biggest effects of earthquakes is the social impact on survivors. Earthquakes have short term impacts as well as long term impacts. The short term impacts can be seen in the aftermath of earthquakes. We can see thousands of people dying and many corpses

There are also environmental impacts. A tsunami, for instance, is produced by an earthquake. Tsunamis are tidal waves that are caused by the sudden movement of plates under the sea floor during an underwater earthquake.

Apart from social and environmental impacts, earthquakes also have negative effects on a nation's economy. Governments have to be responsible for the damage caused by earthquakes. As we can see, earthquakes cause infrastructures to collapse, reservoirs, dams, shops, and hospitals are devastated after an earthquake.





Artificial Intelligence Control System

The application of the AI system can overcome human limitations. It will greatly affect people's



Earthquake Forecast Nodes

The earthquake is detected in advance and the seismic mode is activated the immediately send the information to the mobile phone terminal.



Residential Node

Flexible space layout, balance between privacy and public, safe and comfortable.



Skyfarm Nodes

Using a hydroponic system for planting, to purify urban air, supply food, and become a small food supply station after the earthquake. It would be a ideal place to strengthen people's awareness of environmental protection.



Vertical Transportation Nodes / Robots

Quickly move vertically with a simple rocket backpack to efficiently address everyone's transportation needs.



Base Structure of Nodes / Robots

The super-architecture built with ultra-light, ultra-strength carbon nanotubes acts as a pillar and can double as a transportation tool. The construction project was handed over to the robots, who were responsible for building all the structures of the building.



Sound Wave Nodes / Float Nodes

The force generated by the ultrasonic waves can move the particles inside the object, creating a magnetic field. By using the magnetic repulsive force to complete the temporary suspension of the building, to avoid earthquake damage.



Solar Generator Nodes

Photo-electric conversion is carried out efficiently with coating made of semi-conductive titanium dioxide nanoparticles.



Windpower Nodes

Efficient energy conversion without radiation or air pollution is consistent with sustainable development goals.



Water Treatment Nodes

Accumulate rainwater from nature, and irrigate agricultural irrigation and meet the needs of life. Emergency drinking water can also be provided after the earthquake. Fully embody the concept of harmonious coexistence with nature and humanistic care.



Drone Parking Apron Nodes

Drones can be used as a general means of freight. After earthquake, they can be used to search for survivors and deliver relief materials.



Multipurpose Nodes

Commercial, Office, Recreation, Religious, etc.



Hospital/Quarantine Nodes

After the earthquake, the personnel were subjected to virus quarantine and treatment.



420,000 people in the entire region

More than **5,000** people got killed

82% child mortality

33 years the war been fought

1 goal to go peace

Peace Pavilion

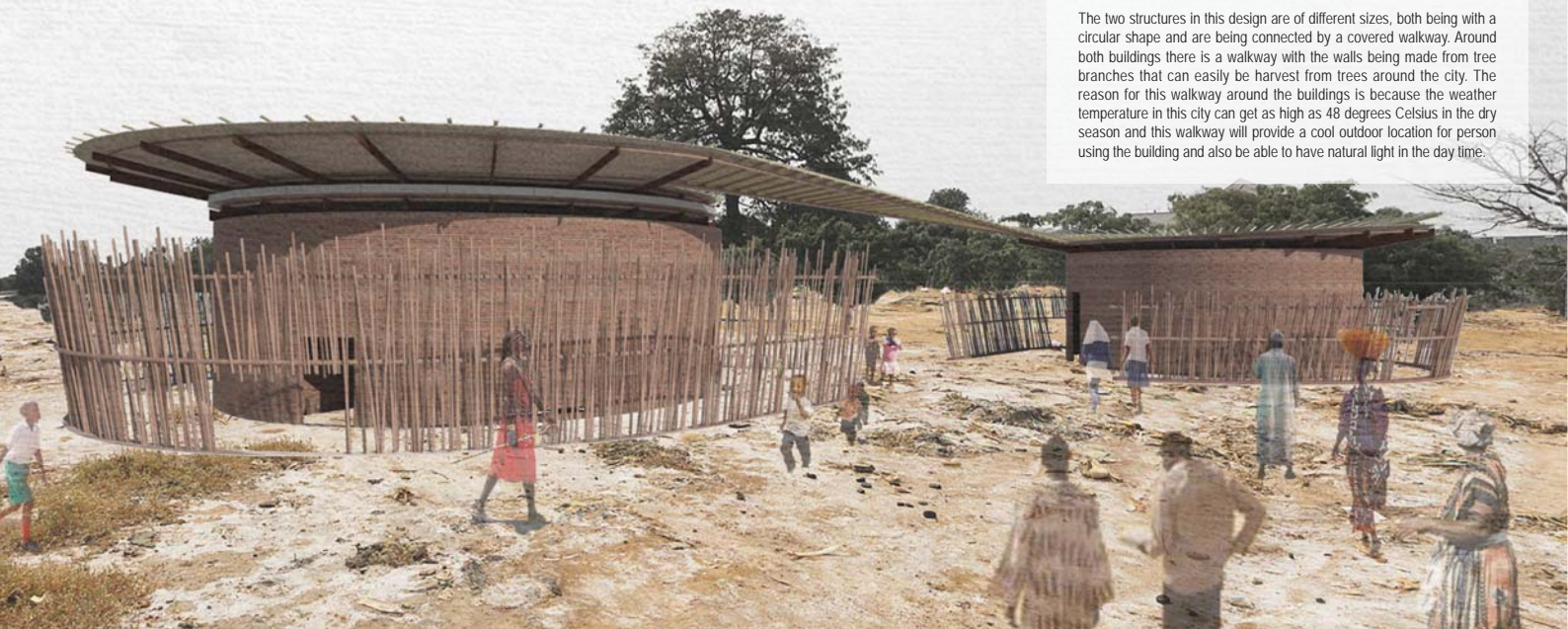
Supplementary Design
Kaira Loro Architecture Competition
(2019)

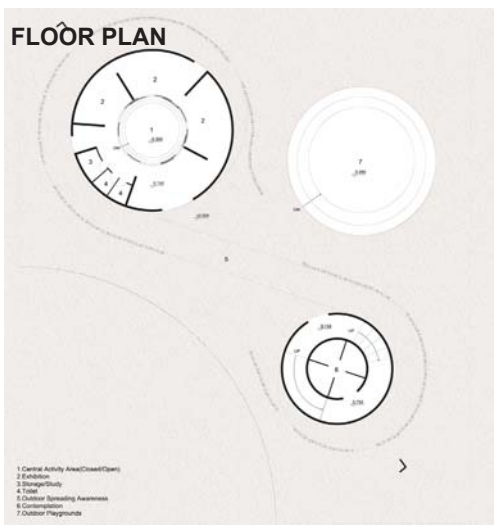
Advisor: Kuowei Chiu

Sedhiou in question was scarred by the Casamance conflicts which, despite having ended approximately a decade ago, left an indelible stain on the community's memory.

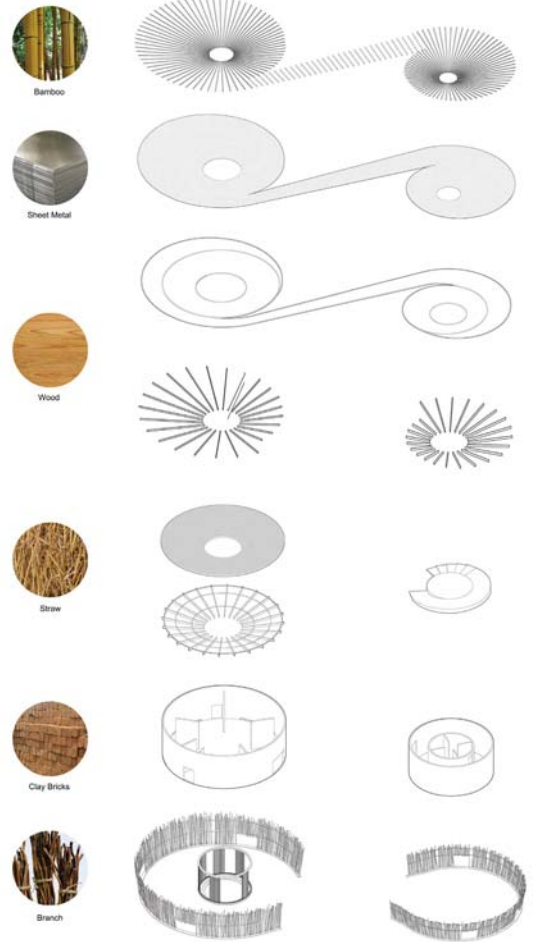
The focus of this competition is to create a pavilion for the promotion of universal peace which inspires contemplation, reflection, and prayer for those who unjustly lost their lives.

The two structures in this design are of different sizes, both being with a circular shape and are being connected by a covered walkway. Around both buildings there is a walkway with the walls being made from tree branches that can easily be harvest from trees around the city. The reason for this walkway around the buildings is because the weather temperature in this city can get as high as 48 degrees Celsius in the dry season and this walkway will provide a cool outdoor location for person using the building and also be able to have natural light in the day time.

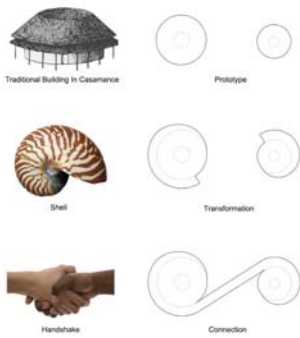




STRUCTURE AND MATERIALS



CONCEPT



Our inspiration of this design idea came from doing some research on Casamance and the traditional building structures that are currently located in the same city as the site of this project and that will also be easy to manage and build by the local people without having to spend a lot of funds while doing so.

After considering the usage of the spaces needed, the team members decided that the usage of two separate buildings is the best way to serve the purpose. The reason for using two separate structures is that space use for pray generally need a quiet atmosphere or surrounding, while exhibition areas normally generate noise from persons attending that area.

BUILDING DETAILS



Bamboo Roof

Creative usage of local bamboos for drainage, and at the same time, it also creates a good visual in the atrium. People who stay here can feel nature and get peace.

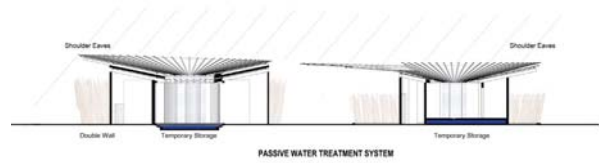
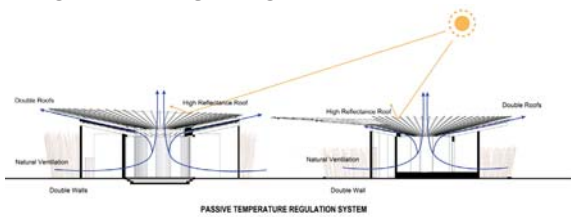
Movable Walls

The movable wall is made by local bamboo, which can be used to make the space private or public by simply sliding the partitions, so that it can meet the different spatial needs of different groups.

Memorial Bridge

To remind people about the history of conflict by making a clear use of the hollow roof which can form a shadow. And at the same time, the space under the roof can be an inspirational area for adults to feel the time and Dialogue with history.

ENVIRONMENTAL SECTION



SECTION





Peace Pavilion
Mottled brick walls
primitive paintings
wonderful light and shadow
quiet atmosphere
Time meets again here

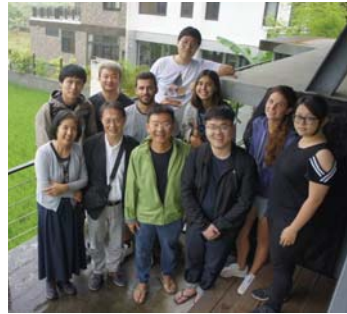
TEAM



Discussion



Exhibition



Study Tours



Barbeque

Reference

1. **Central Weather Bureau**
https://www.cwb.gov.tw/V7/climate/climate_info/climate_change/change_4.html
2. **TCCIP**
<https://tccip.ncdr.nat.gov.tw/v2/index.aspx>
3. **NASA**
<https://www.nasa.gov/feature/jpl/warming-seas-may-increase-frequency-of-extreme-storms>
4. **Ellen Macarthur Foundation**
<https://www.ellenmacarthurfoundation.org/>
5. **Donggang District Fisheries Association**
<http://www.tkfisher.org.tw/webpad/webpad.aspx?EpfJld9UuB8Du0CDA69lw8iKiRqvNxKlZtaWei4%3D>
6. **Information of Containers**
<http://www.mycontainers.cn/>
7. Cultural Affairs Department of Pingtung County Government, The ping-Tung Journal of History (sixth). Pingtung: Cultural Affairs Department of Pingtung County Government, 2002.
8. 葉志杰·聽看東港：從老漁村見識大歷史·臺北縣新店市：野人文化出版，2004.
9. 徐芬春·漁鄉迴旋曲：東港風情詩話·屏東市：屏東縣政府文化局，2005.

