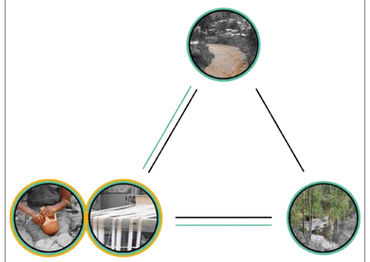
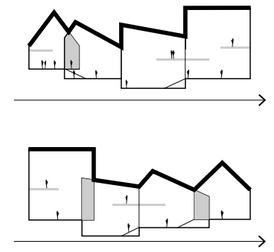
ZHOU WU | PORTFOLIO

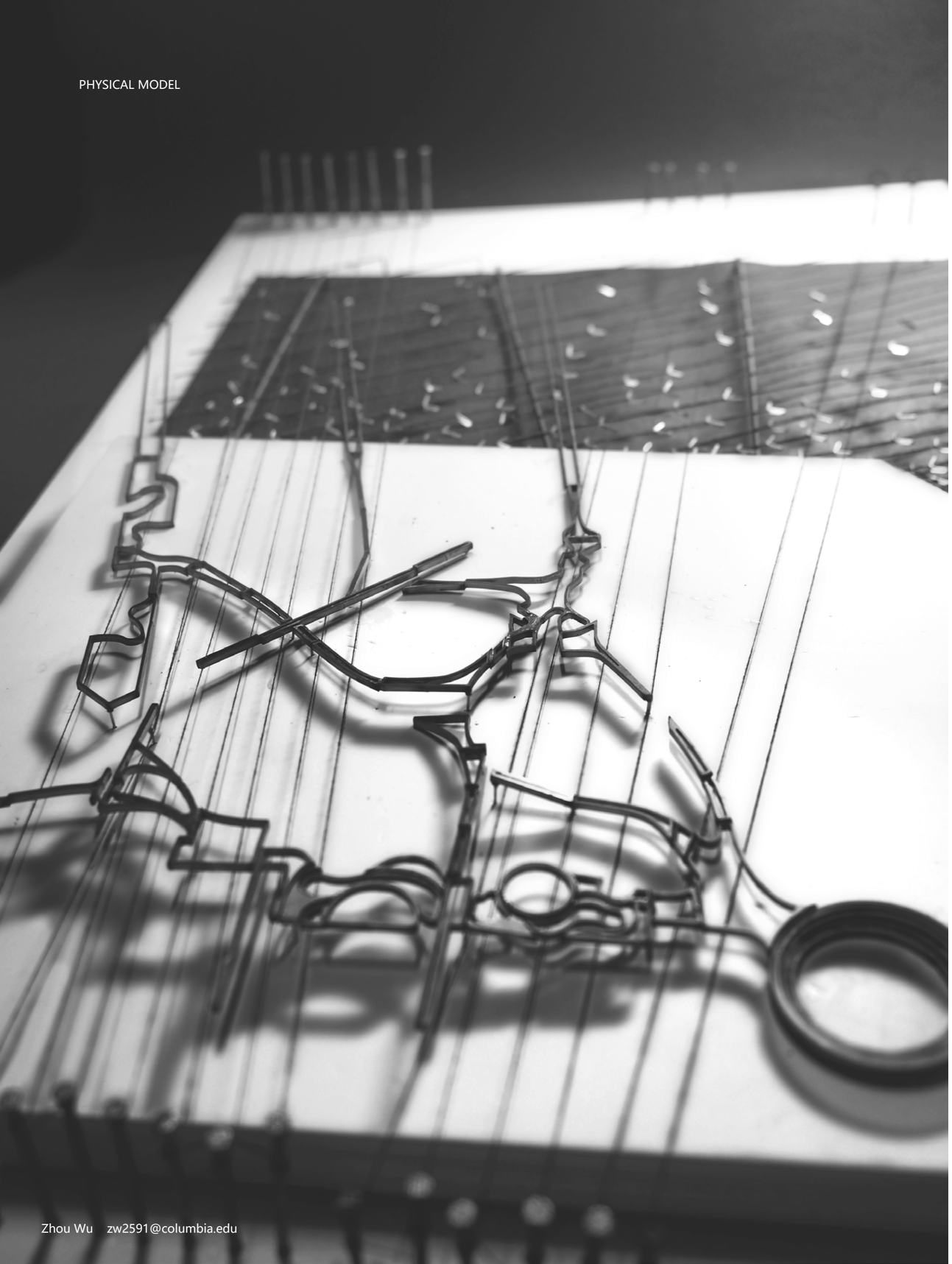
SELECTED WORKS 2014-2020

M.S. AUD, Columbia University
B.A., Chongqing University

CONTENT







01 ORGREENIZED

Urban Renewal of the Westend in Brisbane

Chongqing University, Studio, Team Work
Instructor: Chu Dongzhu
Fall 2017
Team member: Lv Pin, Li Danrui

Brisbane is the third largest city in Australia. With its excellent natural resources and climatic conditions of n 20 ℃ -annual temperature, Brisbane is very suitable for living. Because of this, the city also attracts a large number of visitors every year. The comfortable weather also brings the citizens varieties of outdoor spaces, public activities, and a characteristic shade system helping provide these spaces and activities.

However, due to the average urban altitude of only 0 meters, urban residents have suffered frequent floods for a quite long time. And as for the west end, an area located opposite the CBD, its relatively even lower altitude and flatter terrain make these floods more harmful. Even medium flood could destroy 80% of the land of the west end.

This project aims to strategically use the shade typology to infrastructurally build a three-dimensional drainage and dam system for the Westend area. The drainage system will effectively solve the overland flow caused by heavy rain. It will bring the water in the low-lying area into the ecological reservoir. The dam system will provide effective water storage spaces when the river rises and could prevent water flooding into the city. Also, the system will provide residents with more space for outdoor activities during the dry seasons, because they will be part of the shade system.

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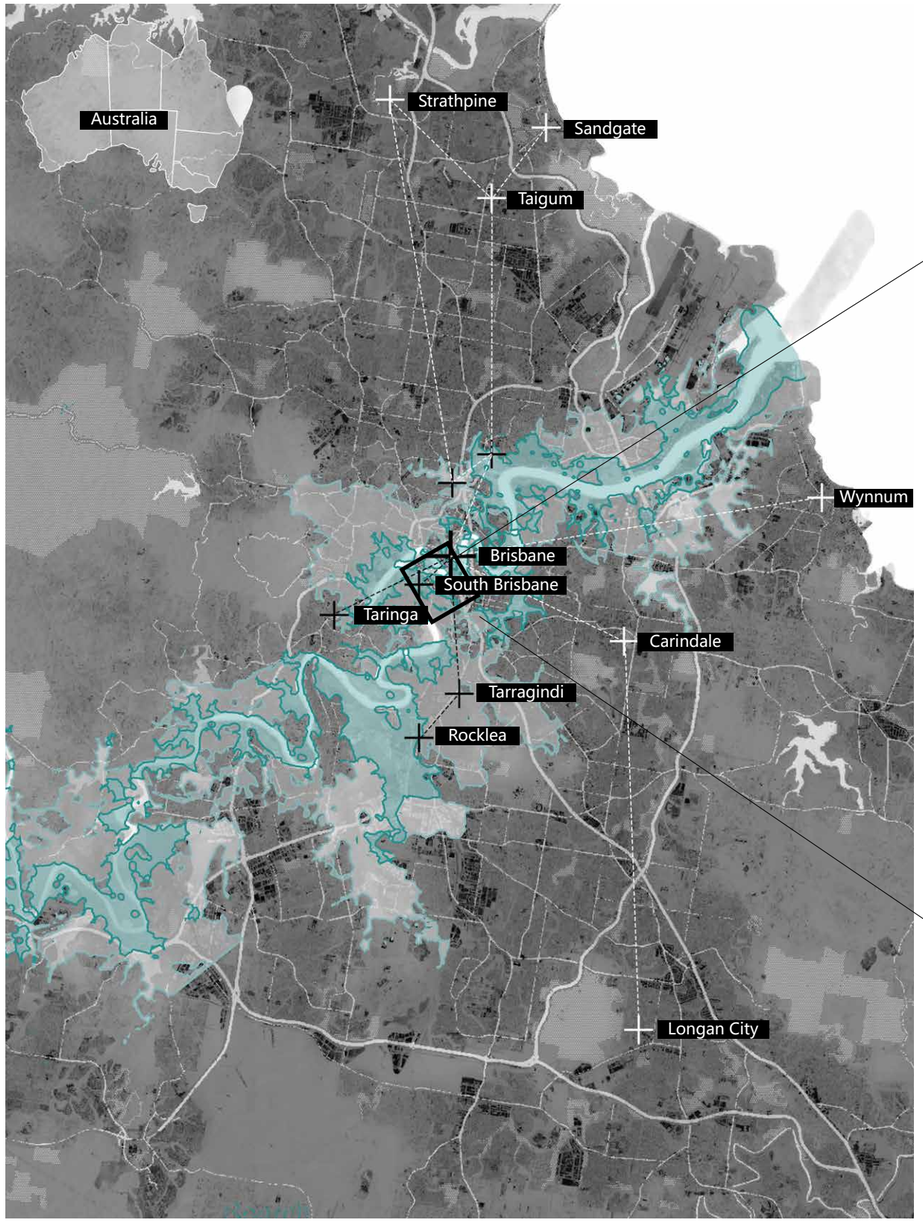
MACRO URBAN CONTEXT | Flood Issue of Brisbane

Brisbane is located in Queensland, Australia, is the capital of Queensland, Australia. The design site is located within the Brisbane inner city and which across the river is the CBD. As a riverside city, Brisbane has excellent hydrological conditions and resources. However, due to the low altitude of the city and the meander of the Brisbane River, it has long been plagued by flooding problems. Also, because of the city 's lack of green land, water cannot penetrate underground efficiently, subsequent problems caused by flooding are magnified.



General Level

The Brisbane River meandered through the city and cuts the city into many riverside triangles.

Minor Flood

Heavy rains in summer often lead to minor floods in low-lying areas within the city and along the river.

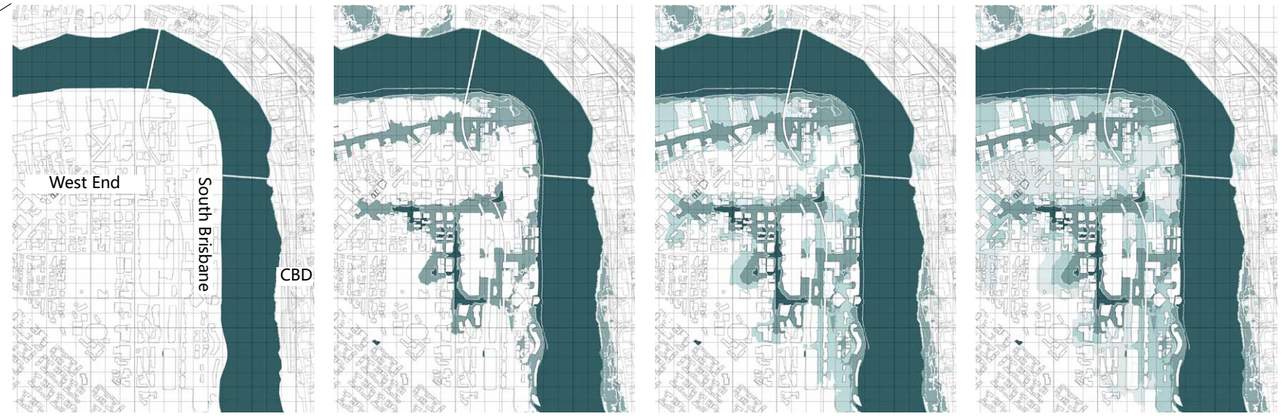
Medium Flood

Due to the low altitude, rising rivers can easily bring medium floods to the city.

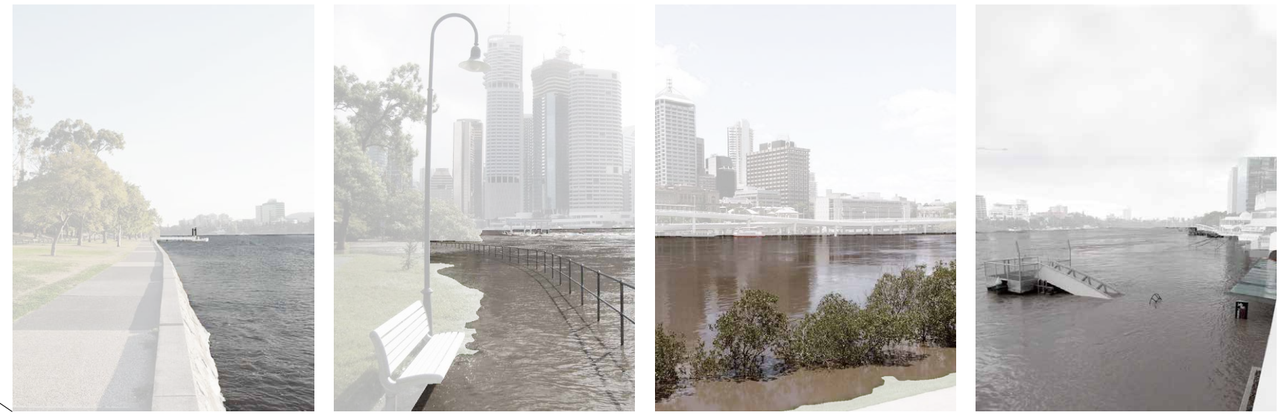
Major Flood

The overland flow and river flood caused by the continuous heavy rain will bring major floods that will inundate 80% of the Westend area.

Flood Area



Flood Impression



Frequency

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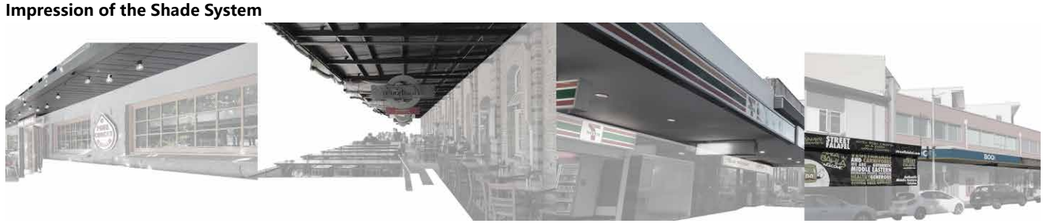
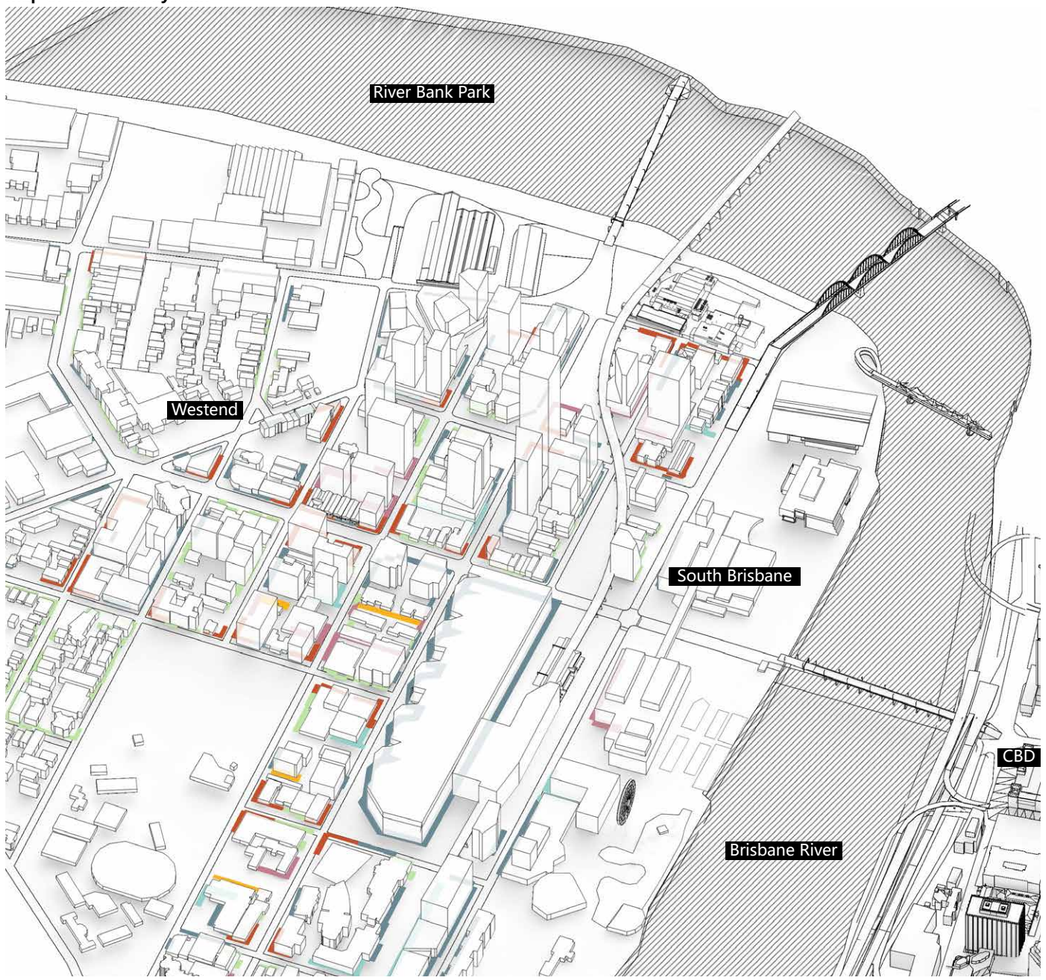
MEDIUM CONTEXT OF THE CITY | Traditional Shade System Research

The subtropical humid climate brings out a comfortable outdoor environment for the city, making Brisbane residents enjoy outdoor activities. Buildings in the city also provide a large number of public spaces for outdoor activities. The shaded system that was forced to be with a building, therefore became a major feature of the city. The shaded system also provides temporary pathways and reservoirs for Brisbane during flood days.

Impression of the Shade System

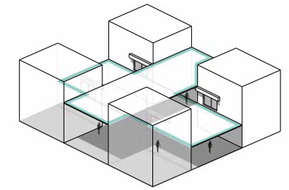


Map of the Shade System



Typology Research

Inner Cross



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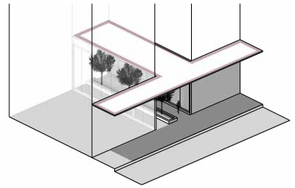
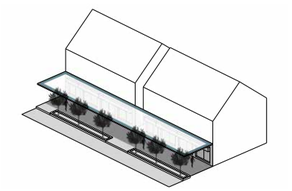
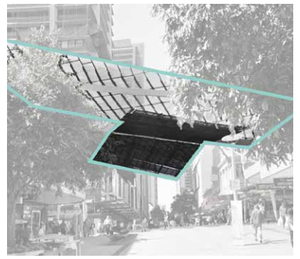
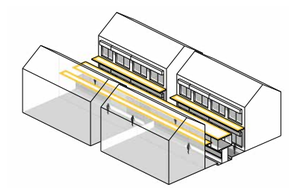


Along Street

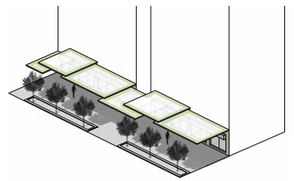




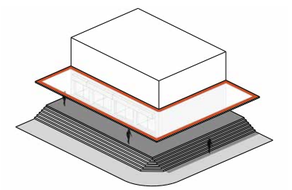
Inner Street



Terrace



Corner & Stairs



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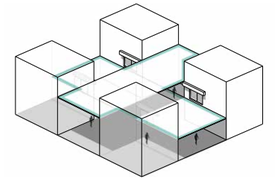
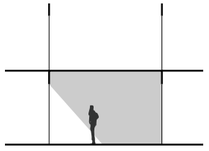
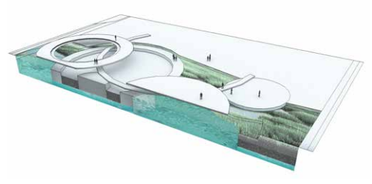
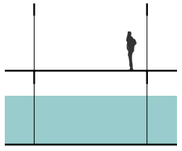
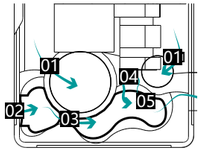
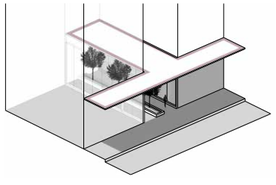
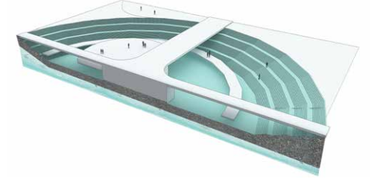
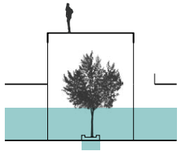
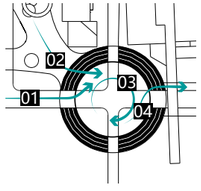
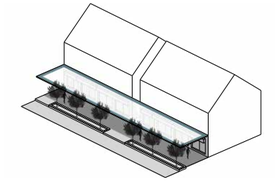
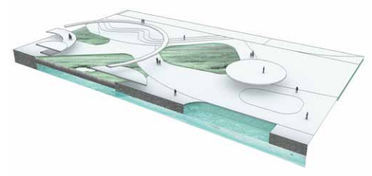
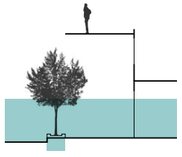
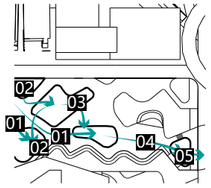
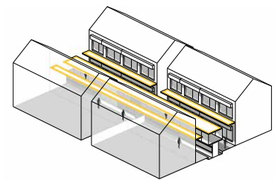
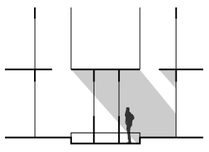
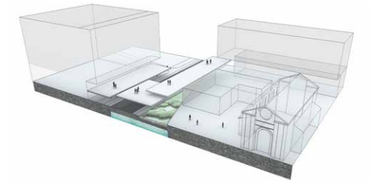
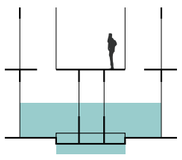
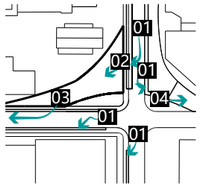
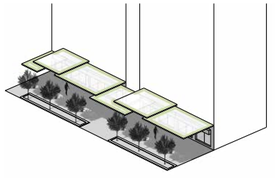
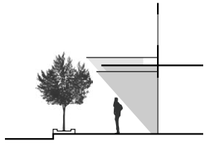
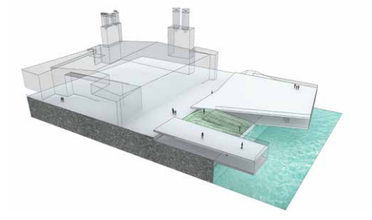
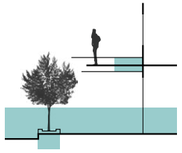
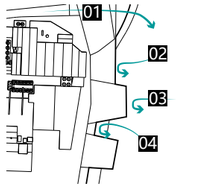
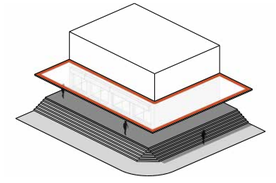
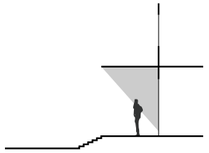
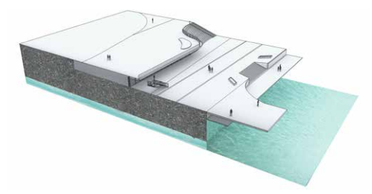
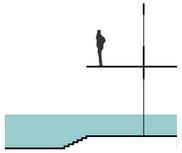
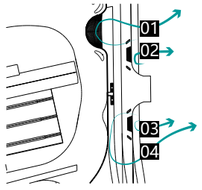
FROM SHADE TO FLOOD DEALING TOOLS | Drainage & Dam

Shade Prototype	Singularize	Current Use in Sunny Days		Drainage	Potential Use in Flood Days	Water Flow	
			→	R1 			1 Surface water collection 2 Groundwater collection 3 Sedimentation 4 Infiltration 5 Transport
			→	R2 			1 Surface water collection 2 Groundwater collection 3 Infiltration 4 Transport
			→	R3 			1 Surface water collection 2 Groundwater collection 3 Sedimentation 4 Transport 5 Transport
			→	R4 			1 Surface water collection 2 Groundwater collection 3 Transport 4 Transport
			→	Dam A1 			1 Flood discharge 2 Dam control 3 Reservoir control 4 Dam control
			→	A2 			1 Dam control 2 Dam control 3 Dam control 4 Reservoir control

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Tool Box

For overland flow, the strategy adopts a method based on the dredge. The strategy selects seven points that are important and easy to accumulate water, connecting them into a dredge network, enabling surface rainwater to pass quickly without accumulating. For the river flood, the design strategy adopted a passive flood control method to raise the river bank. This makes the river embankment have multiple functions of flood protection and providing urban public life.

Drainage

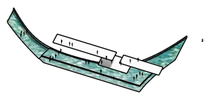
R1

Outer Flood Park

R3

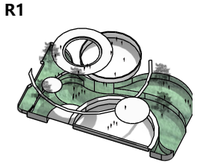
Along Street Park

R4



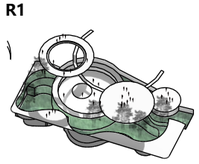
Layered Inner Street

R1



Inner Flood Park 1#

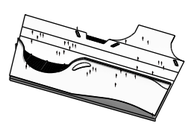
R1



Inner Flood Park 2#

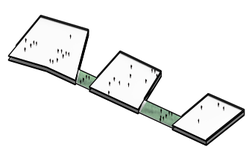
Dam

A2



River Dam

A1



Dam Exhibition Center

R3

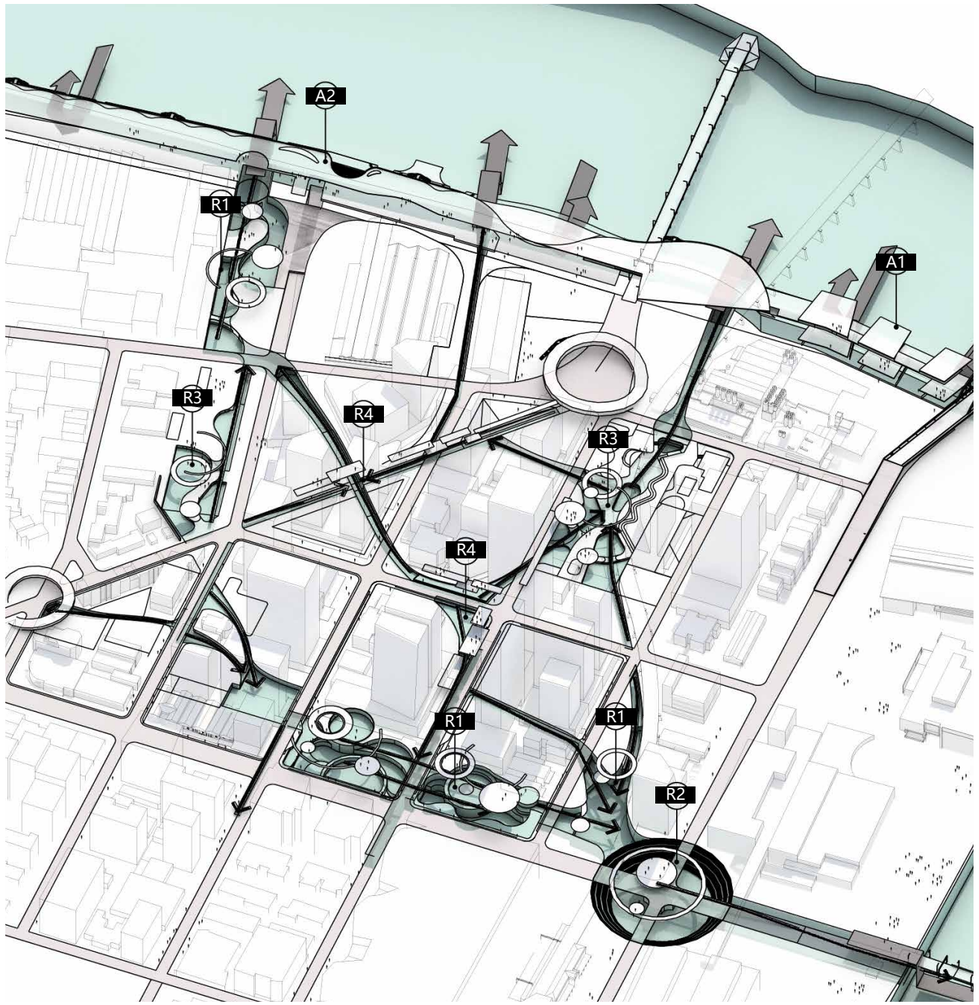
Railway Park

R2

Sunken Square

West End after Development

Overland flow is often caused by sudden heavy rains. The terrain of the site is complex and uneven, so the rain can easily converge in the low-lying areas of the site and cause losses. For overland flow, the strategy adopts a method based on the dredge. The strategy selects seven points that are important and easy to accumulate water, connecting them into a dredge network, enabling surface rainwater to pass quickly without accumulating. For the river flood, the design strategy adopted a passive flood control method to raise the river bank. This makes the river embankment have multiple functions of flood protection and providing urban public life.



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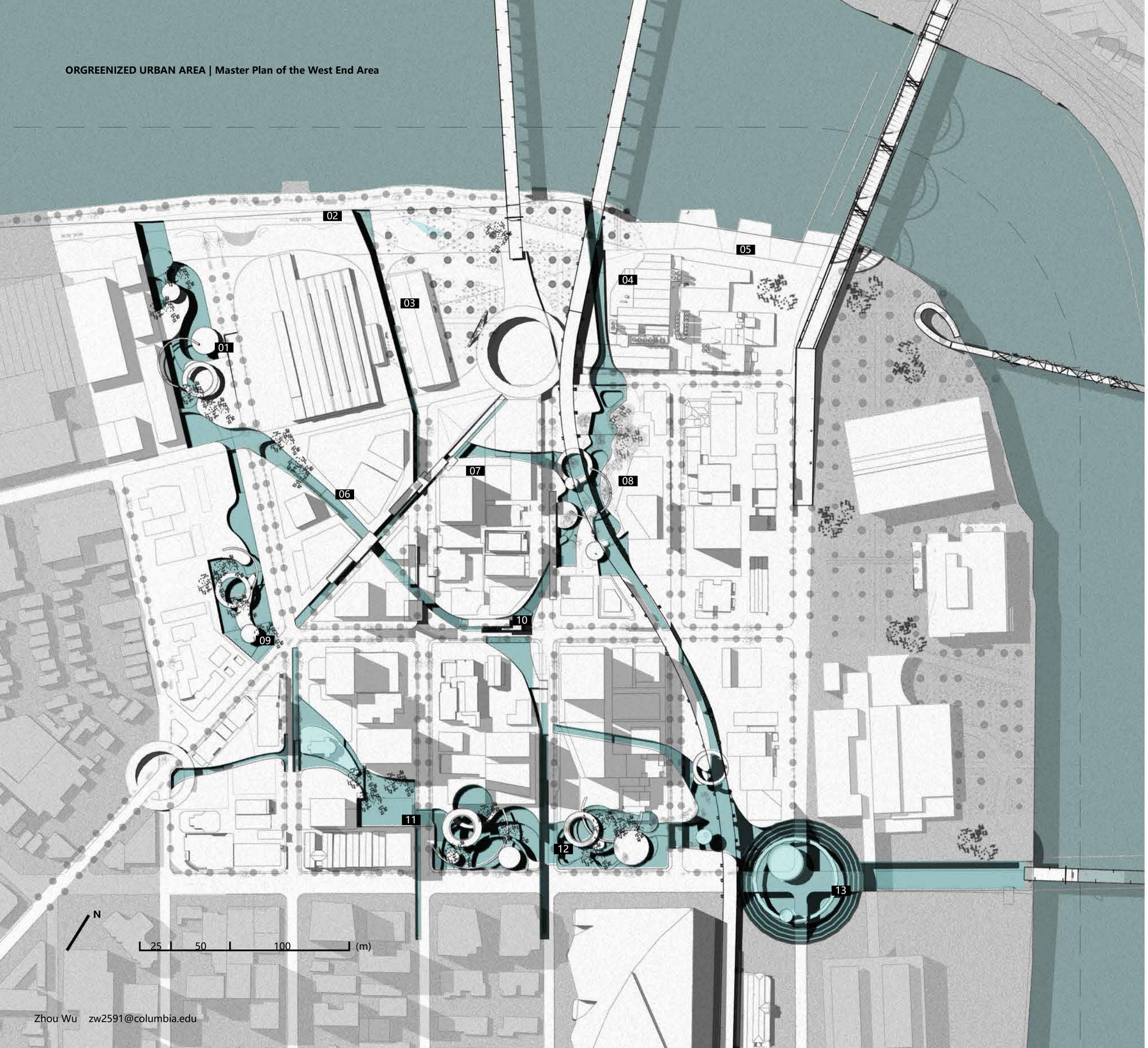
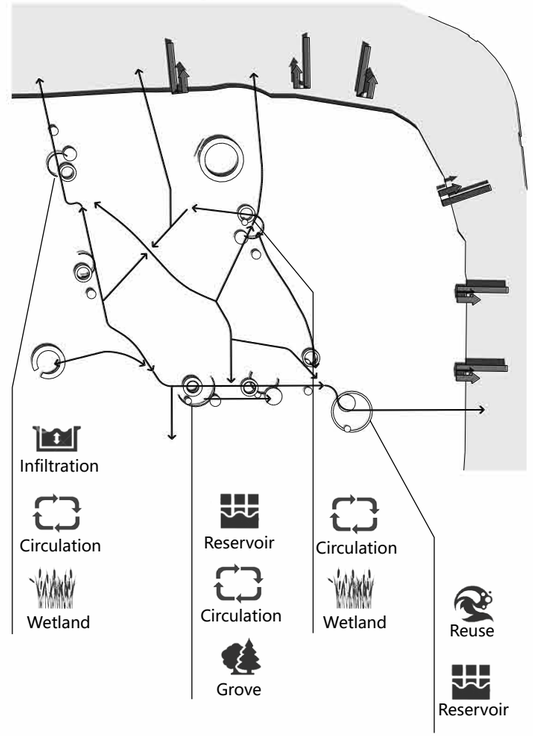


Water Treatment Strategy



Based on the characteristics of the traditional urban street shading system, the design strategy developed a plan to use the featured shade system to make better use of the public spaces of street life during dry seasons and flood periods. There are two types of shade systems for solving flood problems. The first combines public spaces with fast drainage systems, and the other combines public spaces with flood defense dam systems.

Legend

1.Riverbank Park
2.River Dam
3.Drainage Ditch1
4.Drainage Ditch2
5.Bank Exhibition Center
6.Drainage Ditch3
7.Boundary Street
8.Railway Park
9.Wetland Park
10.Water Inlet
11.Reservoir1
12.Flood Park
13.Sunken Square

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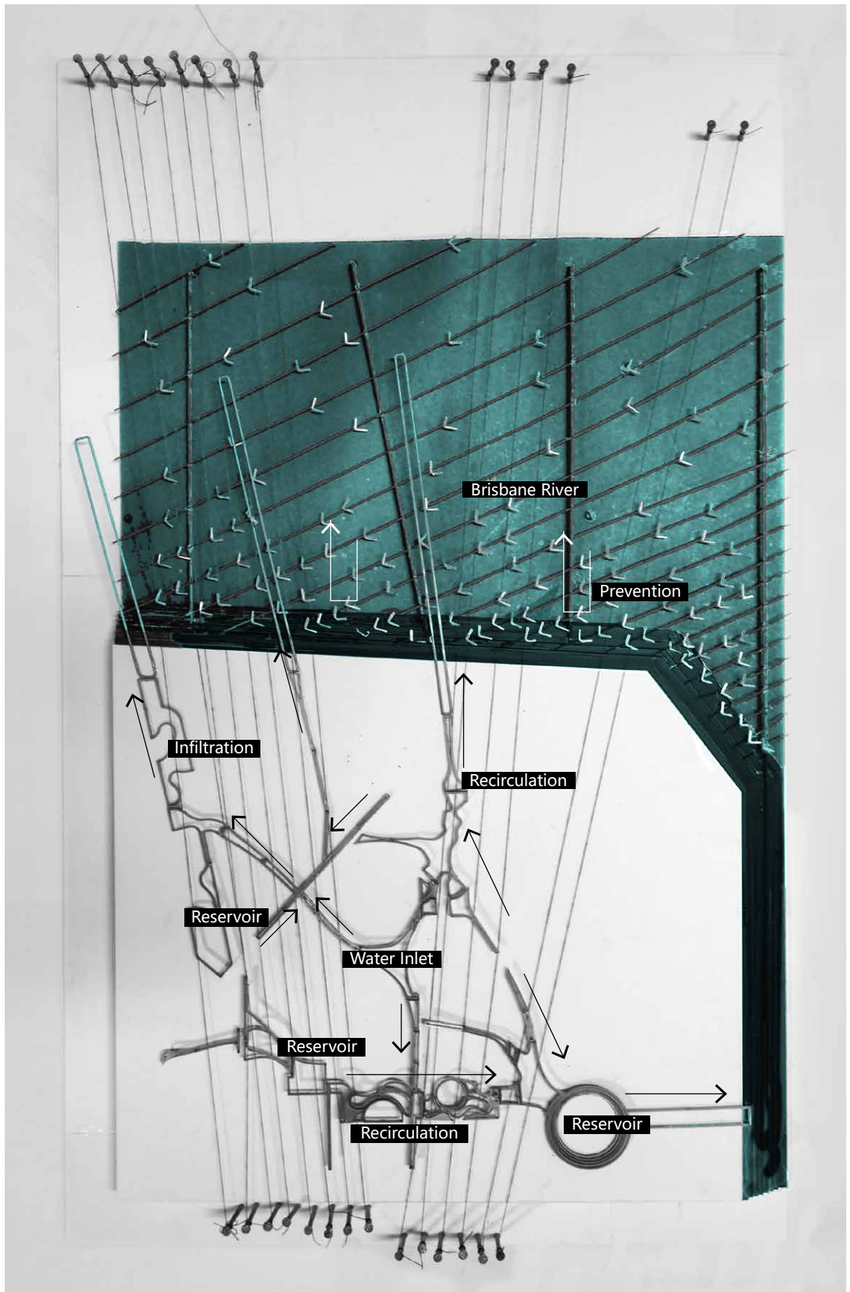
Underground Flood Drainage & Prevent System

Underground drainage systems and flood prevention systems have built a comprehensive flood treatment network for the west end area.



New West End Area of Brisbane

The surface space of the flood treatment system provides more outdoor public spaces for citizens in the west end area. They can make full use of these public spaces for outdoor activities during the dry season.

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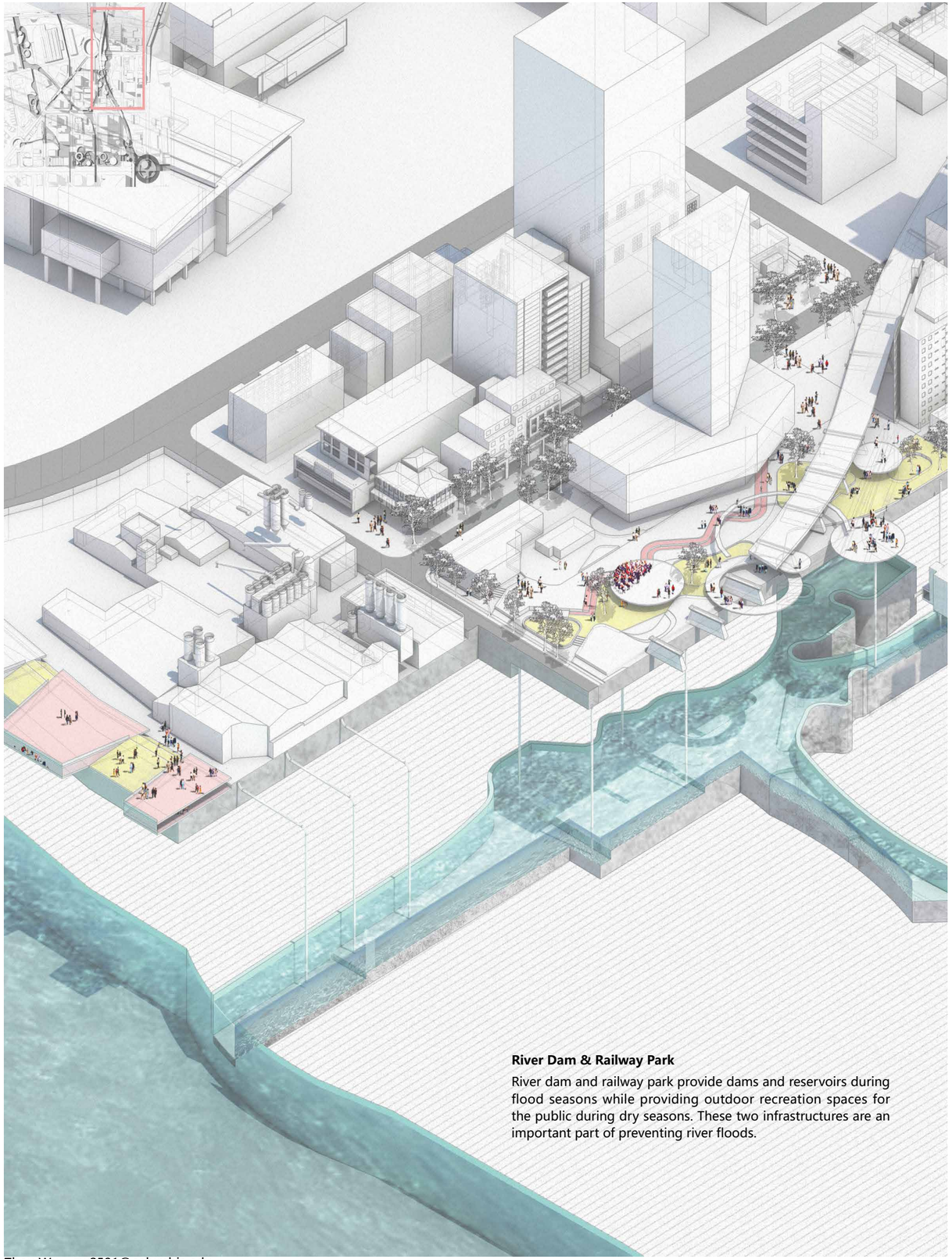
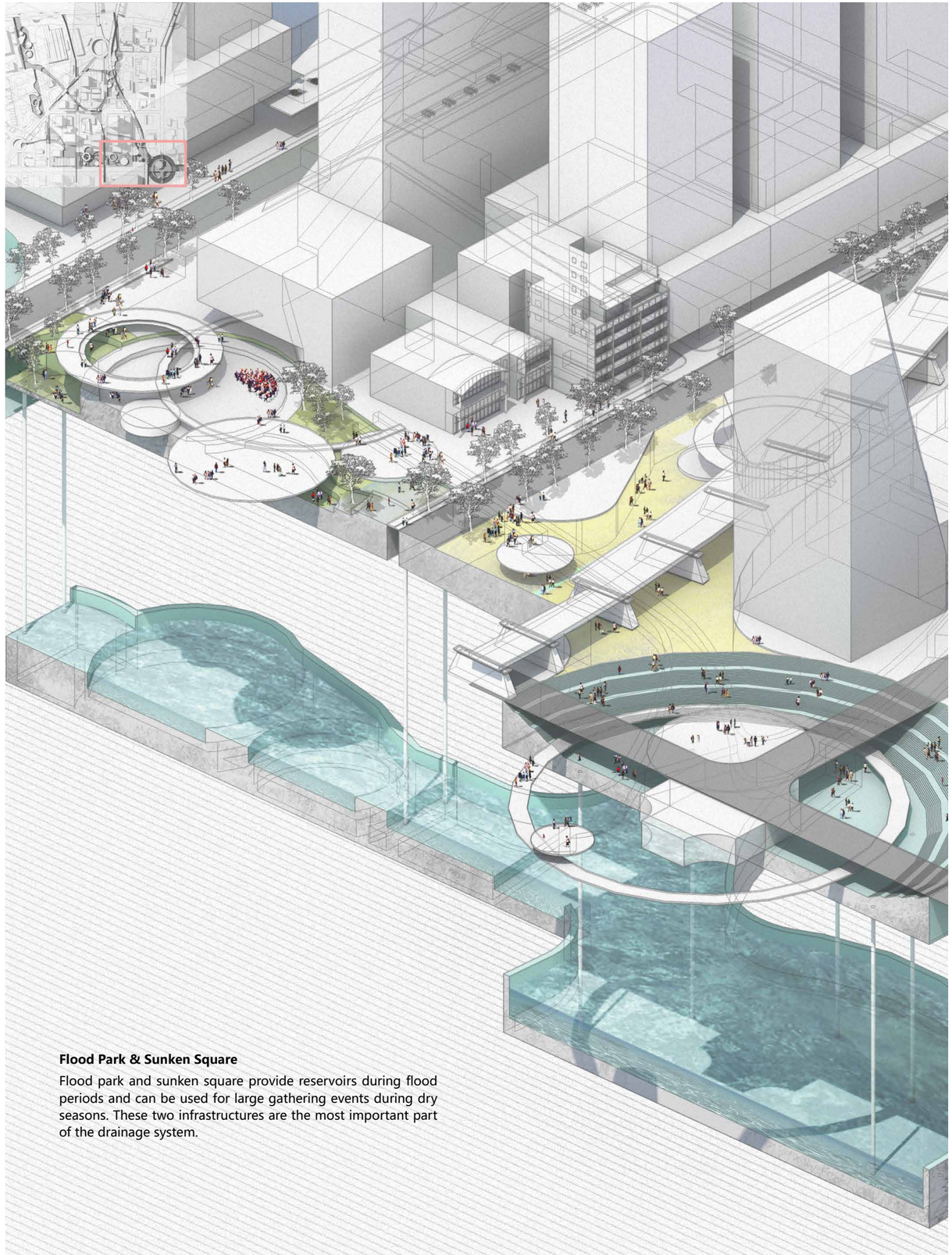


River Dam & Railway Park

River dam and railway park provide dams and reservoirs during flood seasons while providing outdoor recreation spaces for the public during dry seasons. These two infrastructures are an important part of preventing river floods.



Flood Park & Sunken Square

Flood park and sunken square provide reservoirs during flood periods and can be used for large gathering events during dry seasons. These two infrastructures are the most important part of the drainage system.

Dry Season

Flood parks provide public spaces for outdoor urban activities during dry seasons.

Flood Event

The flood park provides a large reservoir for collecting surface water during flood seasons and provides a fast passage for pedestrians.

Dry Season

Multilayer street shade system provides a continuous shadow space for the public during the dry season. These spaces will be used for commercial activities and public life.

Flood Event

Multilayer street shade system provides residents with a fast passage through the flood season that will not be affected by flooding.

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02 TRILATERAL CONNECTION

A Riverfront Integrated Development For Akaki River, Addis Ababa, Ethiopia

Columbia University, Studio, Team Work
Instructor: Kate Orff, Geeta Mehta, Thad Pawlowski, Julia Watson, Adriana Chavez,
Dilip Da Cunha, Lee Altman, Fitse Gelaye

Spring 2020
Team member: Han Shuo, Hua Zhen, Qin Yuan

This project is a combination of several water, eco and local economy related programs, targeting providing community benefits for the majority of craftspeople and artisans.

Kechene located at the north edge of Addis, it is a place that forest, river, and human habitat are physically hydrating with each other. The mountains and rivers shaped the complex natural environment here, and the people settled decades ago. But all of these resources are not being effectively used.

What within the current relationship between economy, water, and ecosystem, apart from physical connection, are only negative interactions. Based on this, we are proposing a design concept that connects these three systems organically, and makes them into positive resources for each other.

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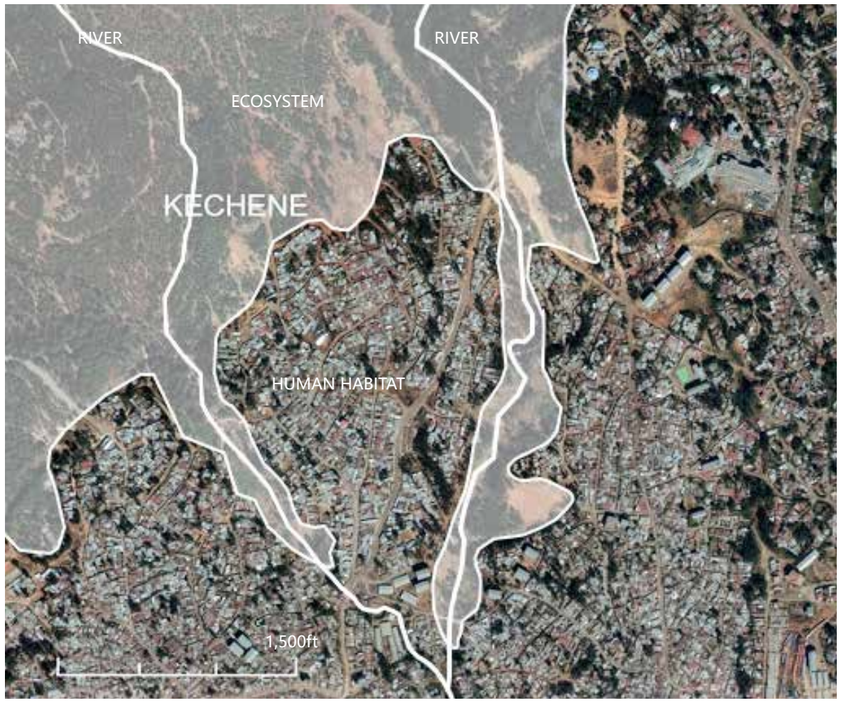
ISSUE OF THE AREA | Missing Public Services & Activities

Nearby abundant forests rivers and human resources can be utilized in a more synergistic manner to improve environmental quality and supply much needed wood and water to support daily life. Local economy, water resources and the ecosystem if unmanaged can create a compounding negative impact - precipitating flooding, hillside erosion and overconsumption. We aim to balance the three systems and turn them into positive resources for each other by forming:

1. Connecting people to managed Natural Resources
2. Generating mroe direct Market Connections between makers and tourists
3. Expanding the potential of peope to maintain and steward these vital landscapes



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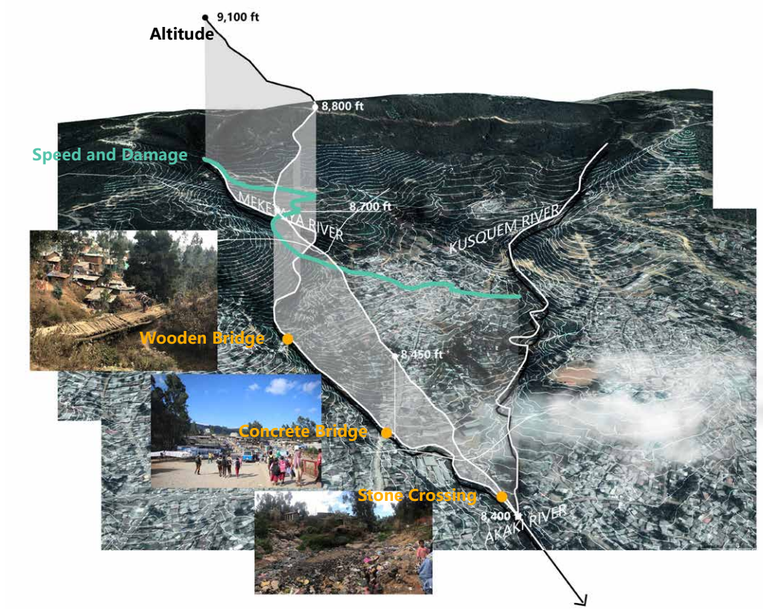
UNBALANCED RELATIONSHIP

STRATEGY

THREE SYSTEMS

SEASONAL FLOODING

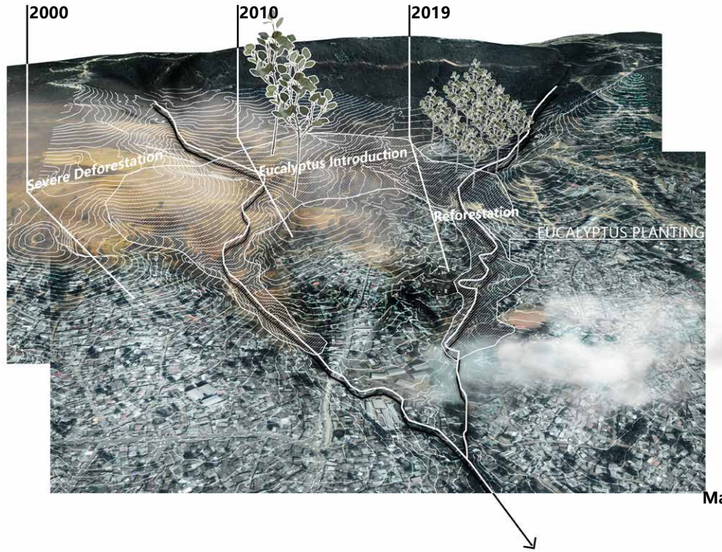
Kechene is close to Entoto, with a steeply sloping terrain. The rapid flow of water down this steep topography causes seasonal floods and intense erosion.



"5 people have died during the last 3 years because the floor destroyed out the bridge and they fell down."

ECOSYSTEM-INVASIVE PLANT

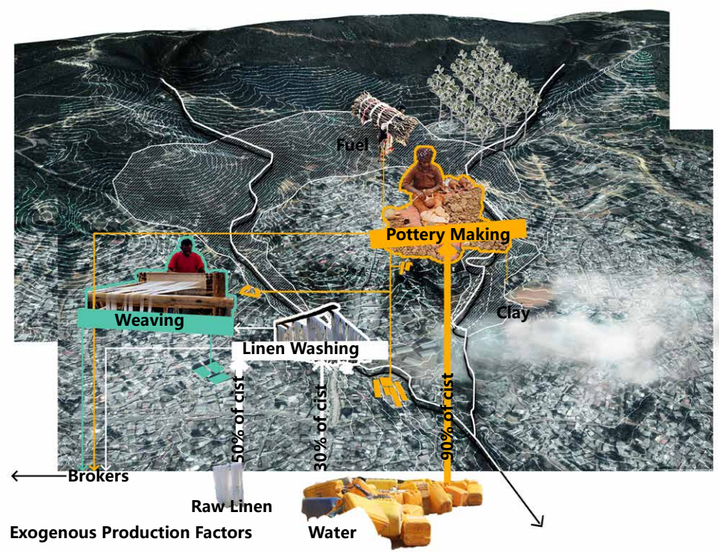
Deforestation has been caused by tbe need for firewood and building materials. Planting Eucalyptus has created a long-term problem instead of solving it. However, Eucalyptus wood remains an important source of firewood and building material for local people.



"The government started planting eucalyptus to rectify the once the once severe deforestation."

CRAFTS ECONOMY

Artisan communities live next to natural resources, but have to depend upon buying bare necessities:
People living next to the River still need to purchase water.
People live next to the forest but only use it as a source of firewood.
They live next to the city but need intermediaries to sell their goods.

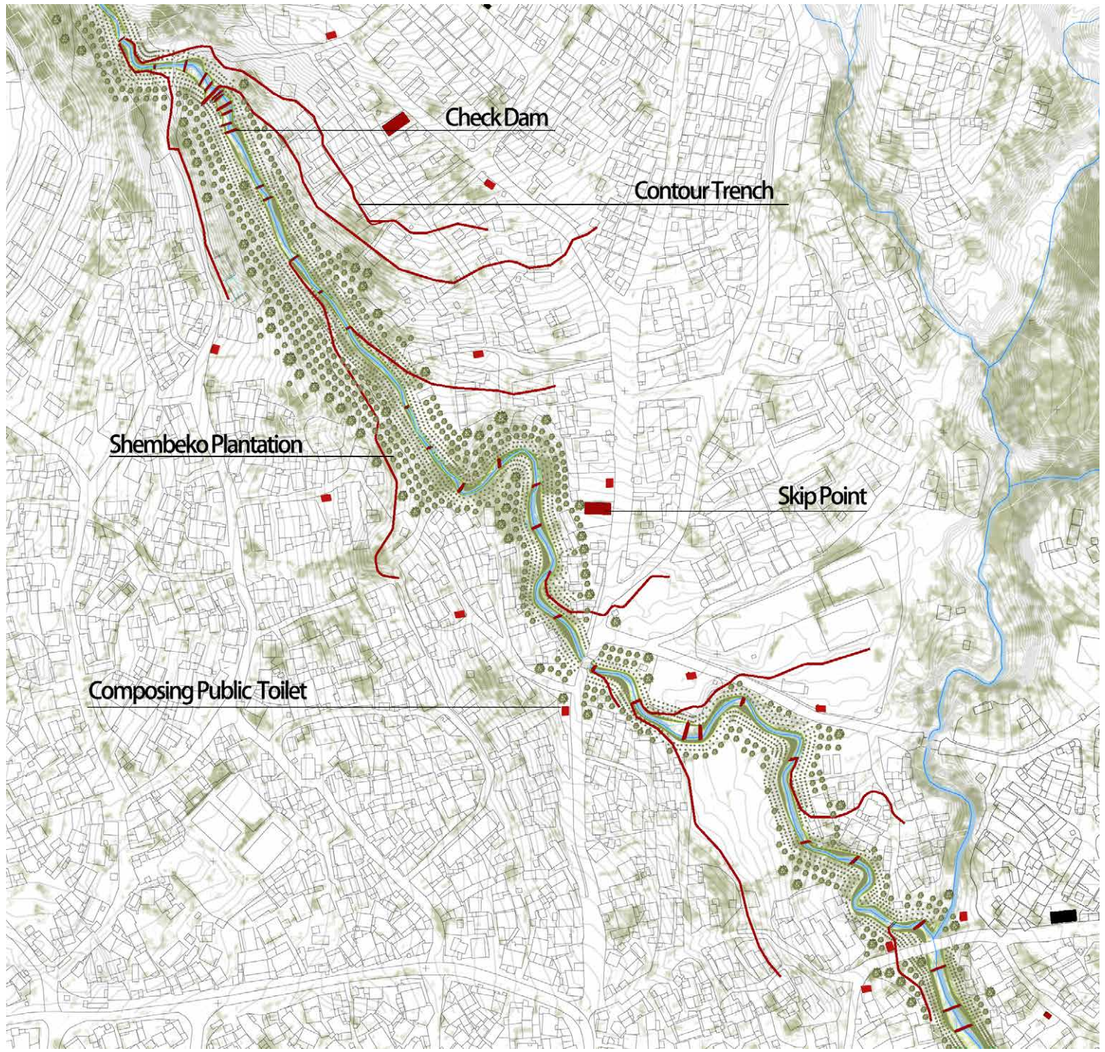


"I can make up to 12 pots a day, and have a net monthly income of about 2,000 br. For every liter water I use, I need to pay 2.5 to 4 br."

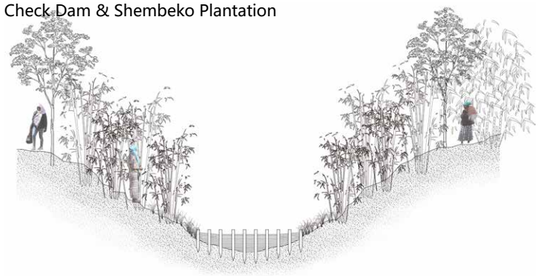
"We need 5 tons of water per week and this is a significant portion of our production costs."

ENHANCING NATURAL RESOURCES FOR SUSTAINABILITY:

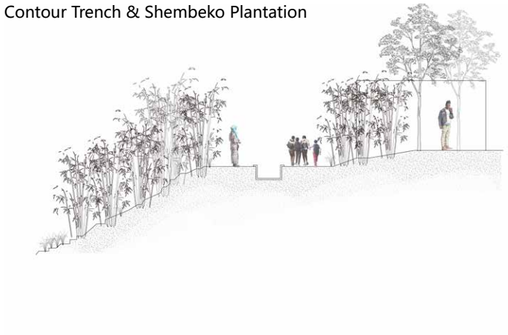
Shembeko is planted on stream banks for water purification and thatch building materials.
Check Dams and Contour Trenches are built to slow the water down, reduce erosion, and define crossing points.
Public Toilets and Skip Points (Solid waste Collection Place)for waste treatment and river cleansing are introduced as nodes along the system.



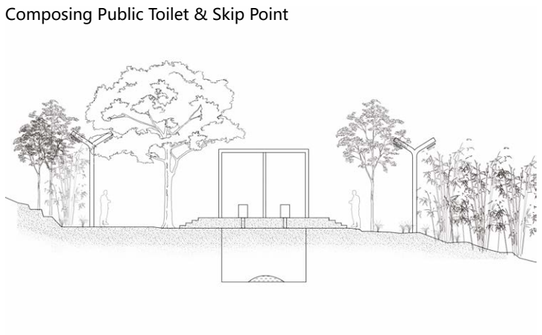
Check Dam & Shembeko Plantation



Contour Trench & Shembeko Plantation

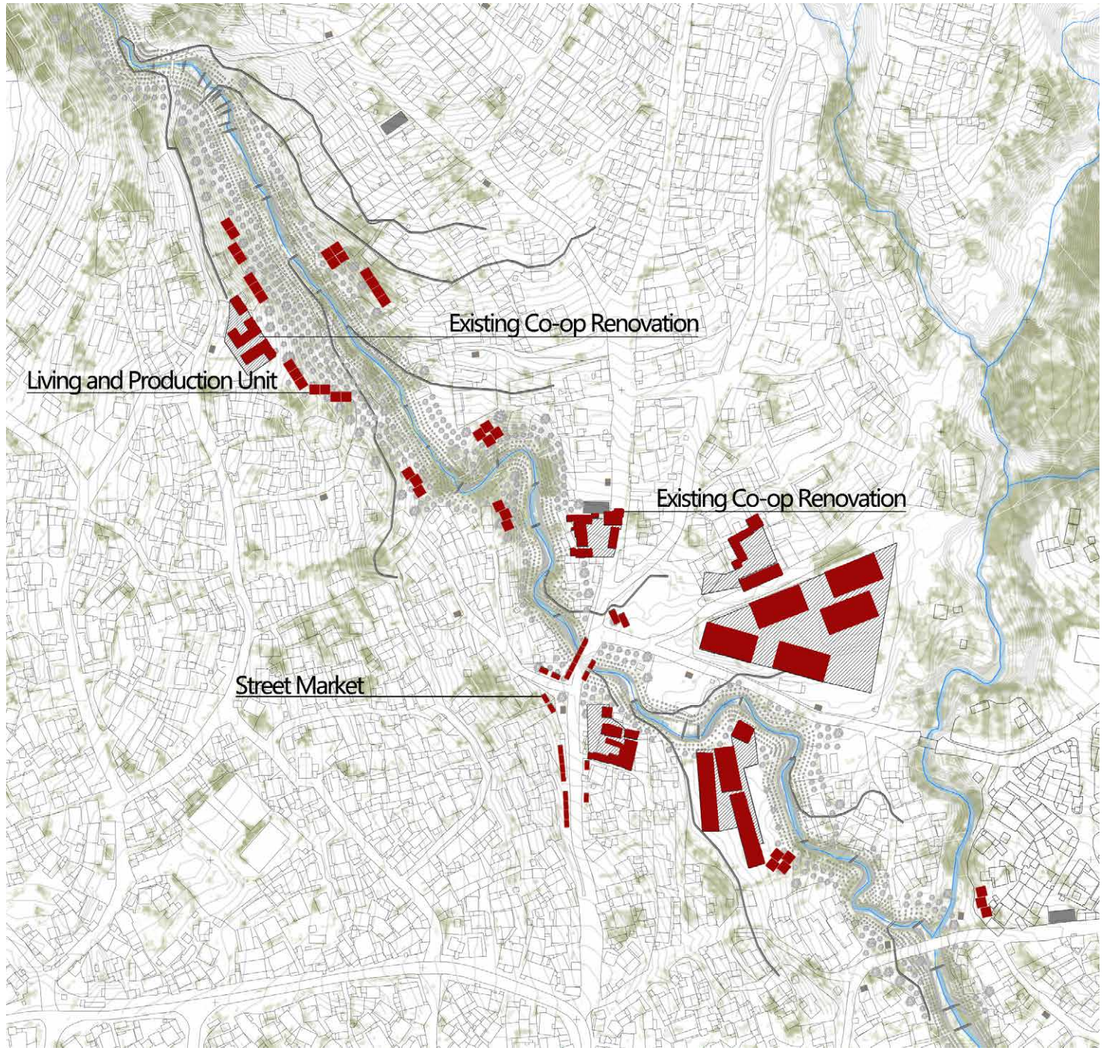


Composing Public Toilet & Skip Point

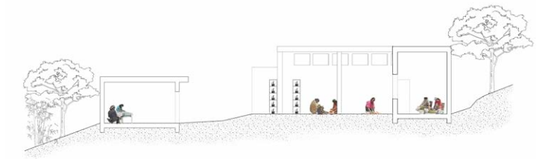


EXPAND HANDICRAFT MARKETS FOR INCREASED DIRECT INCOME:

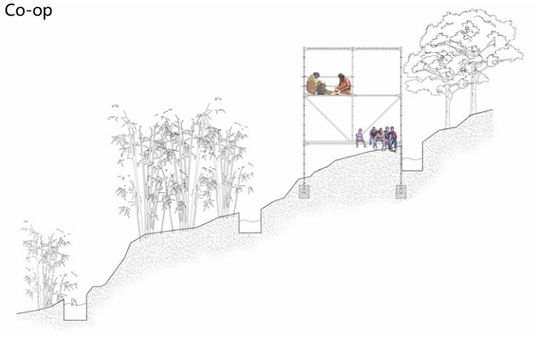
Construct street market with modular framework for direct selling.
Leverage existing co-op renovation for better working environment.
Produce living & production units for economy expandability.



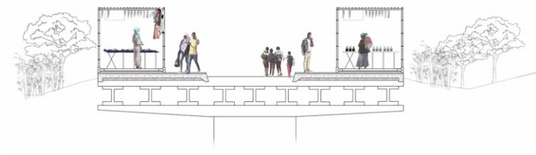
Street Market



Co-op



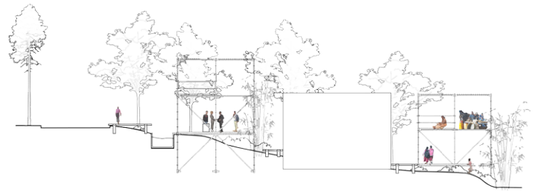
Living & Production Units



IMPROVE THE LIVING ENVIRONMENT AND OPEN UP CRAFTS MAKER MARKETS FOR LOCAL MARKETS AND POTENTIAL TOURIST INTEREST.

Define a series of activated riverfront public market spaces and community facilities.

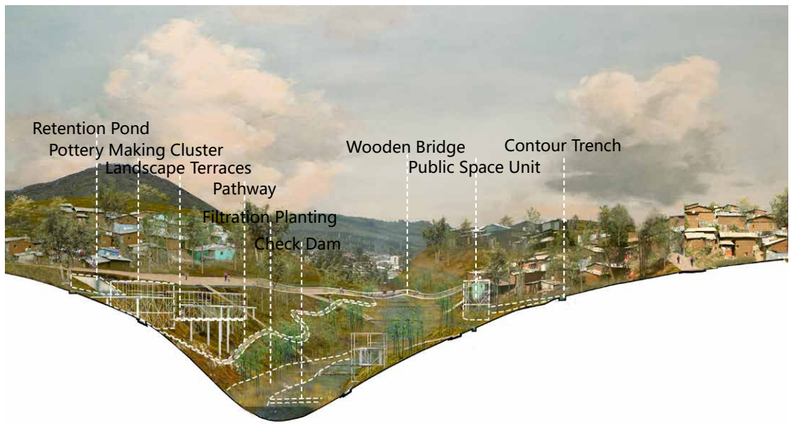
Living & Production Units



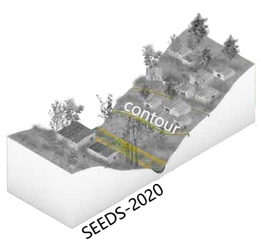
Riverfront Park

The Wooden Bridge

Offers a safe crossing point and market programs.



ECONOMY IMPACT
40 direct job
30 indirect job
more diversified profit model



The Concrete Bridge

A site for market activities and production such as drying yarn and cloth.

ECONOMY IMPACT
200 direct job
100% saving on water consumption
55% building material cost saving

The Stone Crossing

Offers an infrastructure for improved environment and seedling cultivation area.

ECONOMY IMPACT
40 direct job
50 indirect job
55% building material cost saving

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Wooden Bridge

Meketaya & Kusquem River

Concrete Bridge

Stone Crossing

Addis City

Eco Programs

Econ Programs

Advance Spatial Programs

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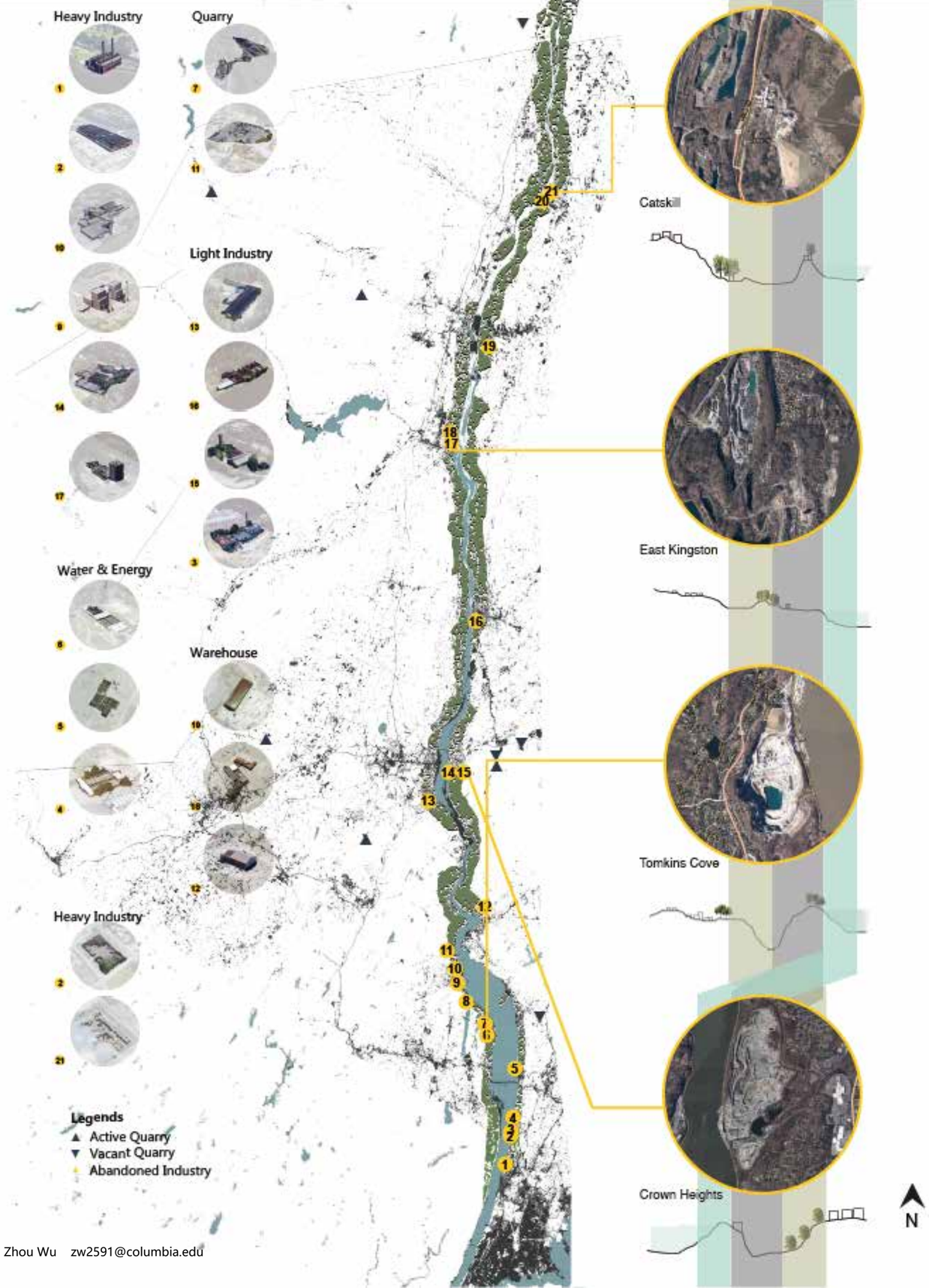


03 QUARRYSCAPE

A Productive Development For Bleach Quarries, Hudson Valley

Columbia University, Studio, Team Work
Instructor: Jerome Haferd, Kaja Kuehl, Elizabeth McEnaney, Justin Moore, Shachi Pandey
David Smiley

Fall 2019
Team member: Palvasha Sophia Khan, Nikita K, Ashwin Nambiar

Historically, industries dotted along the Hudson River had thrived and polluted the environment. Post De-industrialization, these industries were abandoned and are now inaccessible, creating a barrier from the waterfront. The barrier of blight is a pattern that can be observed along the riverfront in historic industrial towns along the Hudson river. These industries destroyed the ecology by taking over forests and wetlands thus altering the natural hydrology of these sites.

Moving towards a low carbon future, we have envisioned the creation of productive and recreational landscapes in these polluted and contaminated sites. Can industries and nature co-exist?

Barrier of Blight

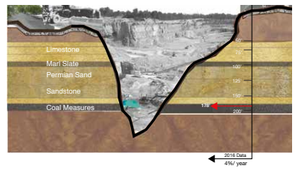
Renaturalizaing Historic Wetlands/Watershed

Productive Recreational Landscape

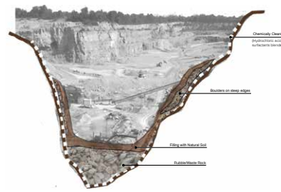
PRODUCTIVE

Phasing And Timeline of the Quarry Revitilization

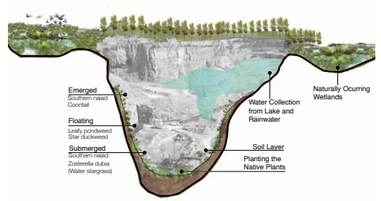
2019 1.Existing Condition and Capacity



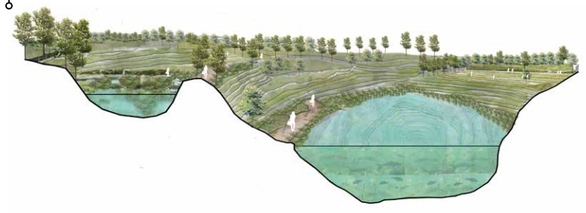
2023 2.Cleaning the Quarry



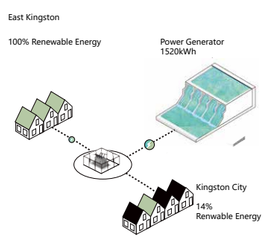
2025 3.Restoration/Adding of damaged Ecology and Habitats

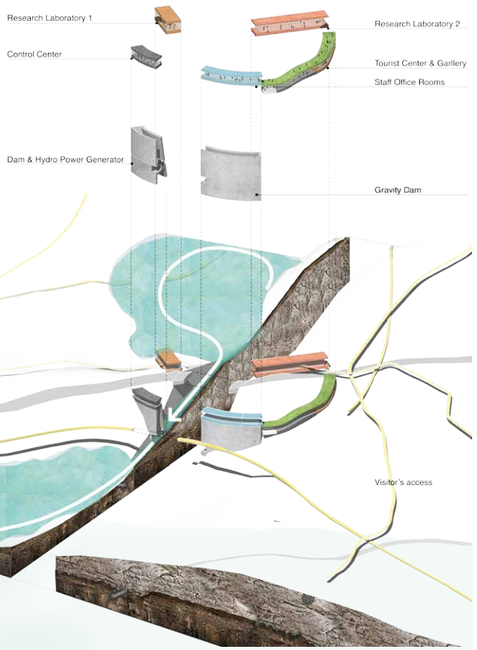


2026 4.Quarry Revitalized and ready to use for water storage for renewable energy

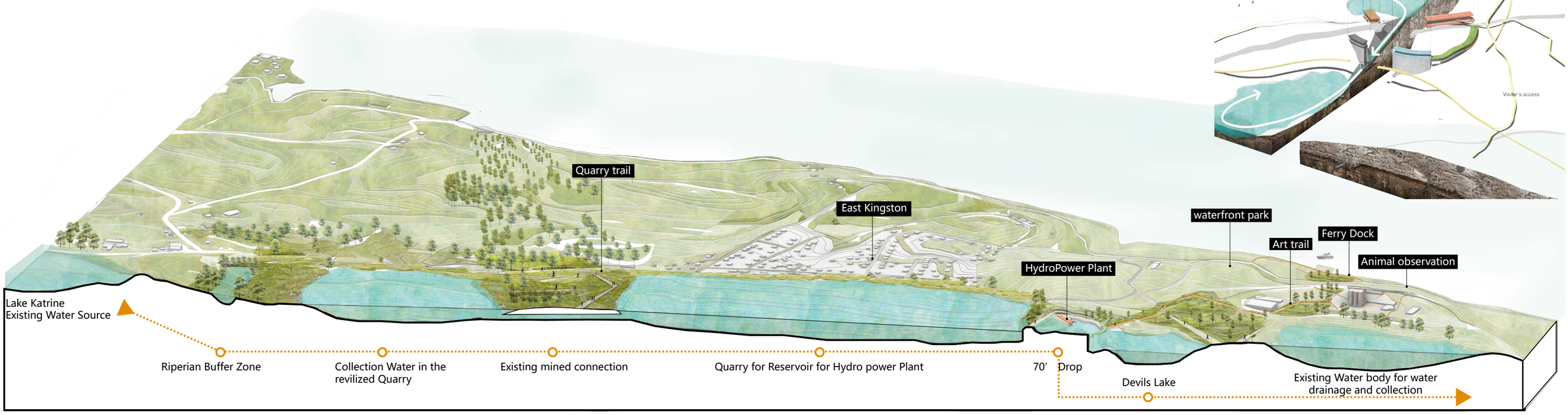


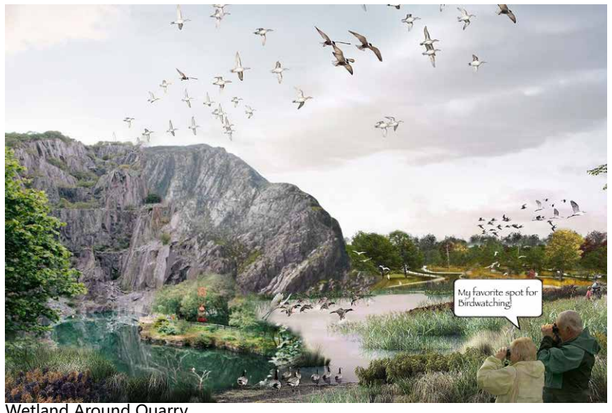
Hydropower Plant Details



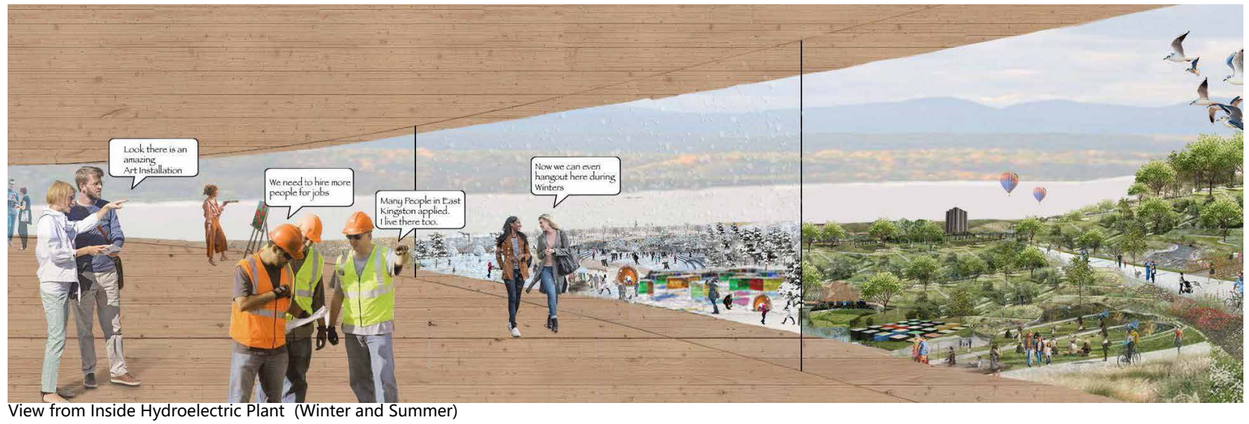


Site Water And Ecology System





Wetland Around Quarry

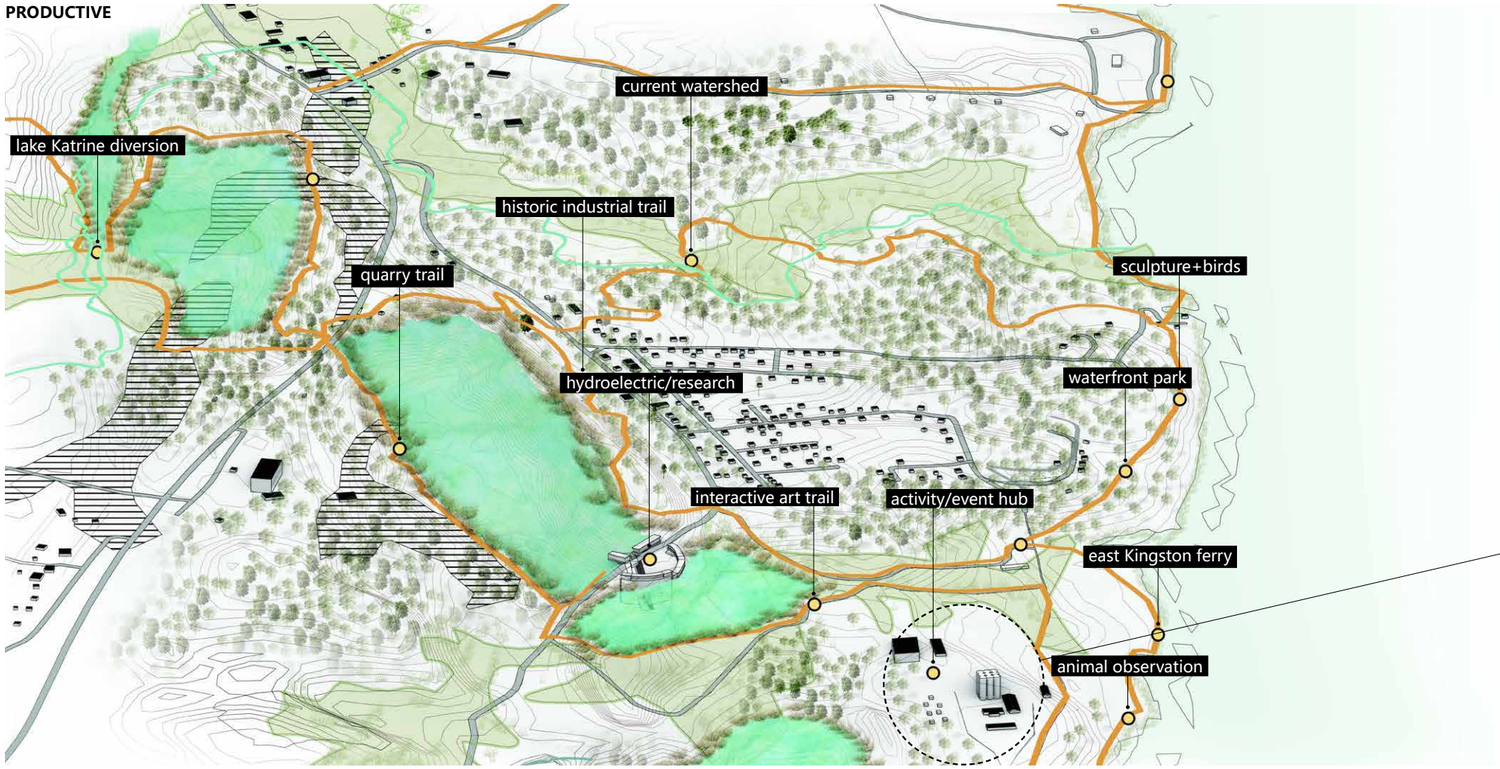


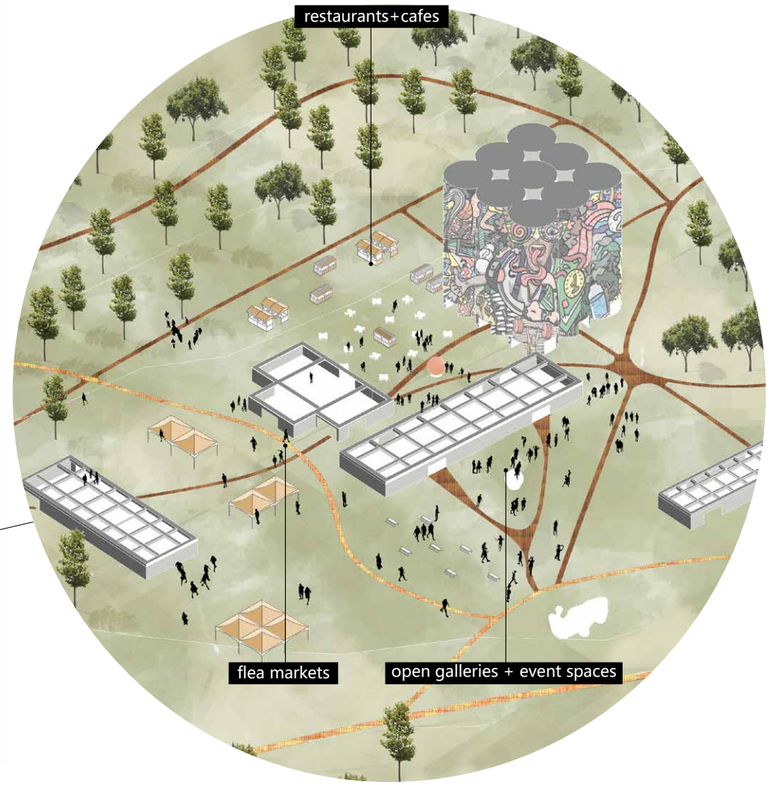
View from Inside Hydroelectric Plant (Winter and Summer)

Revilization of the Quarry

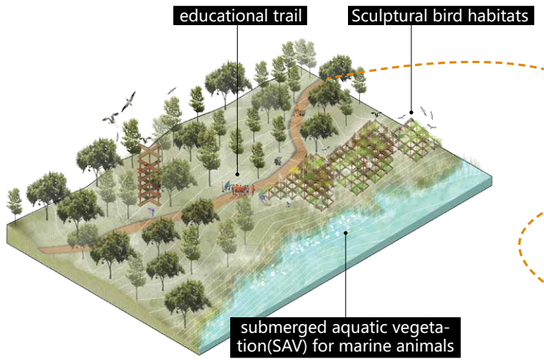
Zhou Wu zw2591@columbia.edu

PRODUCTIVE

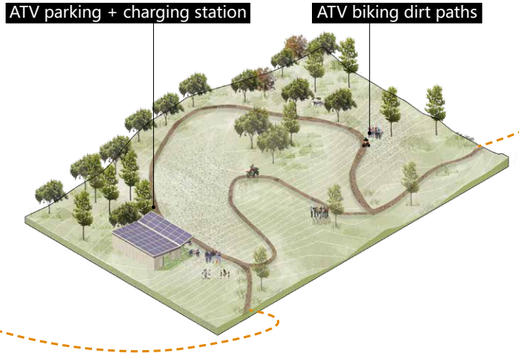




Proposed Recreational Trails/Activities

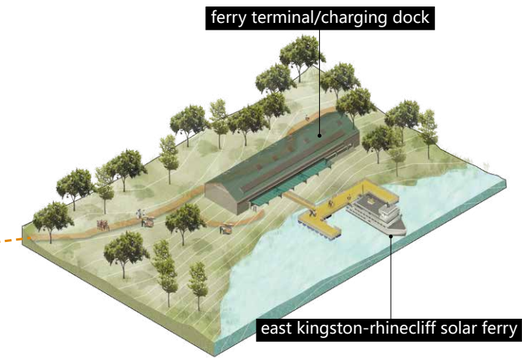


Birds/Animals Habitat Trail



ATV Biking+Racing Zone

Quarry Edge Trail



East Kingston-Rhinecliff Ferry

East Kingston Trail

Ferry+Waterfront Park

Activity Hub

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04 THE HACKENSACK RIVER FRONT

A New Equitable Transport Orientated Neighborhood

Columbia University, Studio, Team Work
Instructor: Tricia Martin, Nans Voron, Hayley Eber, Sagi Golan, Quilian Riano, Austin Sakong
Shin-pei Tsay, Alex Burkhardt

Summer 2019
Team Member: Angus Palmer, Anai Perez

The Hackensack River side of Jersey City is regarded as the forgotten part of town by its residents. The intended design site is bookended by Lincoln Park and the imminent Bayfront Development. The primary objective of the design is to create an equitable transport orientated locality that benefits the existing community, and will also instigate future urban growth.
This vision can be achieved through the enhancement of three correlated systems that have a distinct reliance upon each other. Firstly, the locality needs to be better connected with effective sustainable transport options. This will provide an opportunity to create a unique multi-functional retail setting around the transit hubs.
The development of community initiatives in the retail area, will serve the purpose of providing assistance and support to the existing lower income households. This will ensure local networks can be developed, which will reduce displacement and promote economic opportunity and diversity within the retail identity.

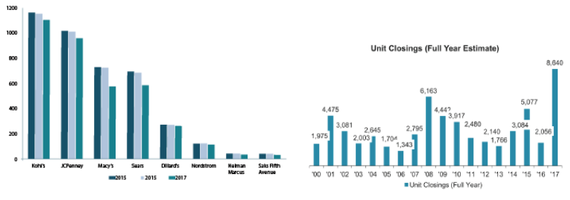
HACKENSACK RIVERFRONT

The western side of Jersey City is:

- **detached and segregated** from the rest of the municipality
- **lacking transit connectivity**, which is a major factor that has contributed to neutral urban growth
- experiencing **neutral or negative population growth** and property value increase
- experiencing a **decline in retail**, while community initiatives are hard to develop or maintain

Other key aspects of the area include:

- **Route 440**, which is aligned north-south and experiences high volumes of traffic
- a visual and physical **barrier to the Hackensack River**
- adjacent low income areas at risk of **displacement**
- a **gated residential community** to the south and **sports fields** to the north



KEY BENEFITS OF A TERMINUS

A terminus or station need not be just a place for transportation.

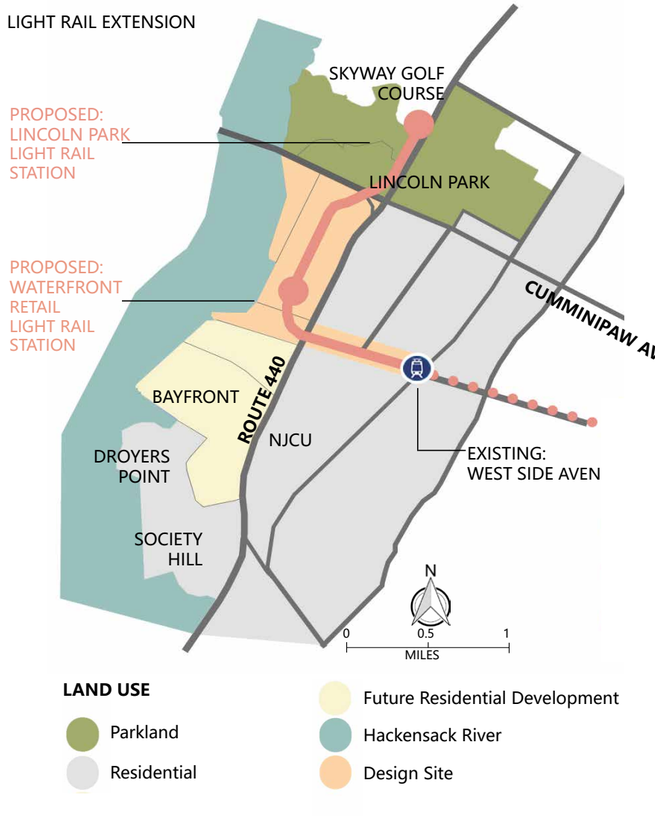
The extension of the Hudson-Bergen light rail and the creation of new terminus' will provide a place around the proposed retail hub where people can come together, socialize and shop.

Key benefits of the terminus to the local area:

WHO FOR? Existing residents and future populations, including those families located through central and western Jersey City.

WHY? To create a unique place that will connect the western side of Jersey City and cater for it' s demographic.

HOW? Better Connectivity-Rejuvenated Retail-Supported Neighborhoods.

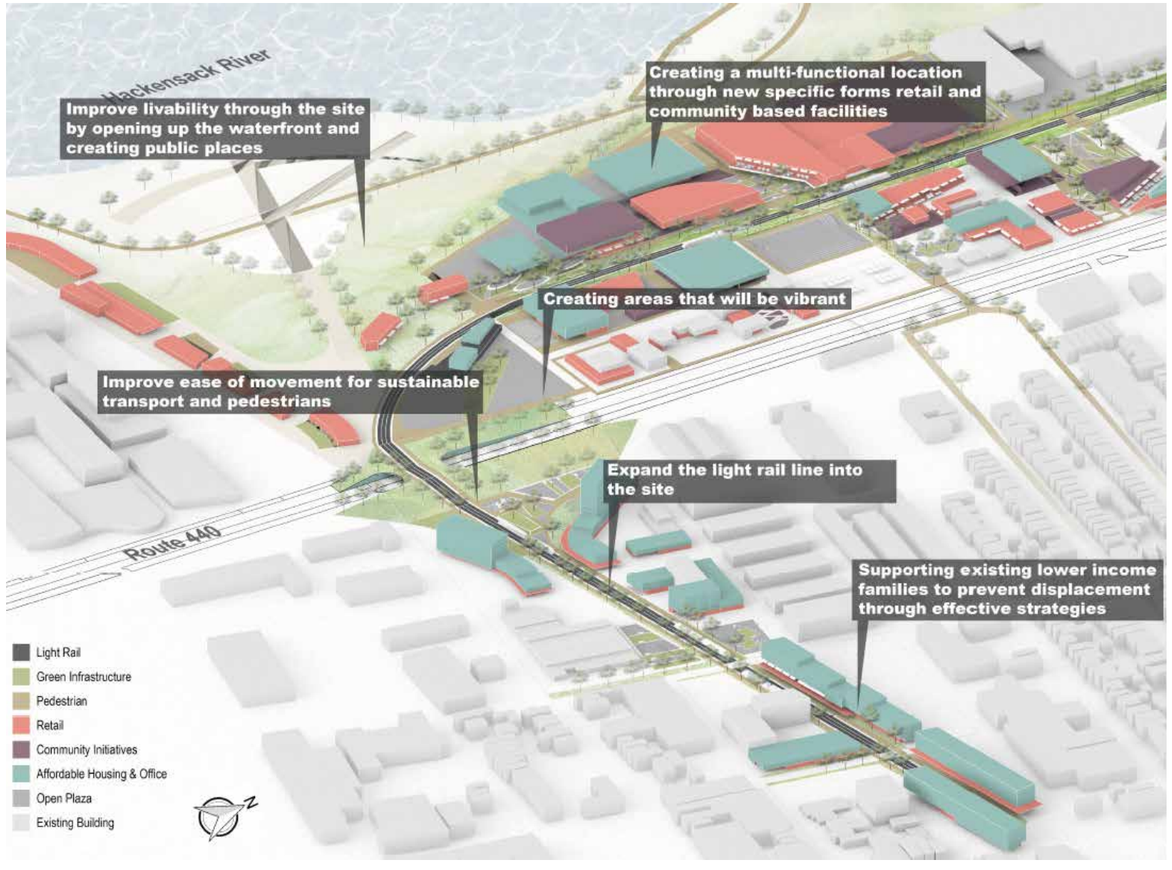


Transportation hubs can also become key spaces for **community activities**, particularly if some kind of **plaza or public space** is provided nearby.

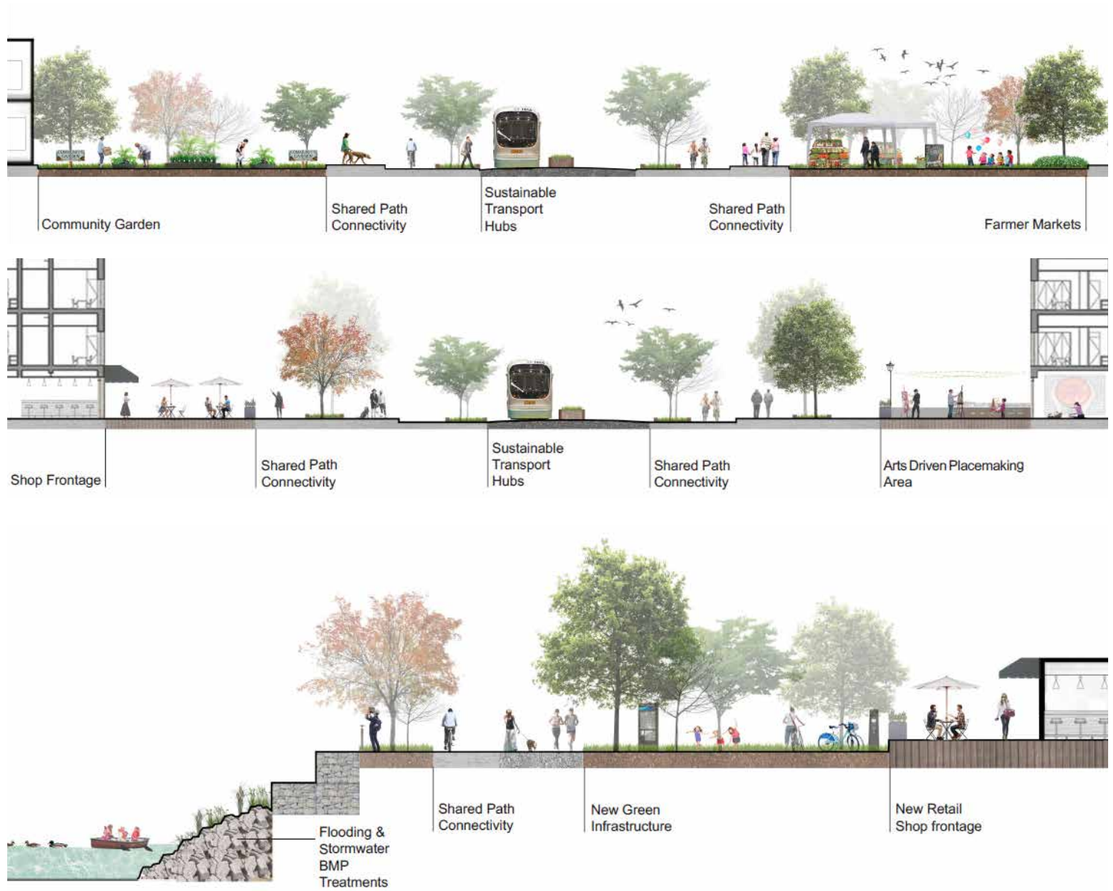
The terminus will stimulate **urban revitalisation** and deliver customers closer to, and **anchor retail**.

The light-rail will deliver passengers to the Hackensack River area and could all be part of an **integrated transport** solution.

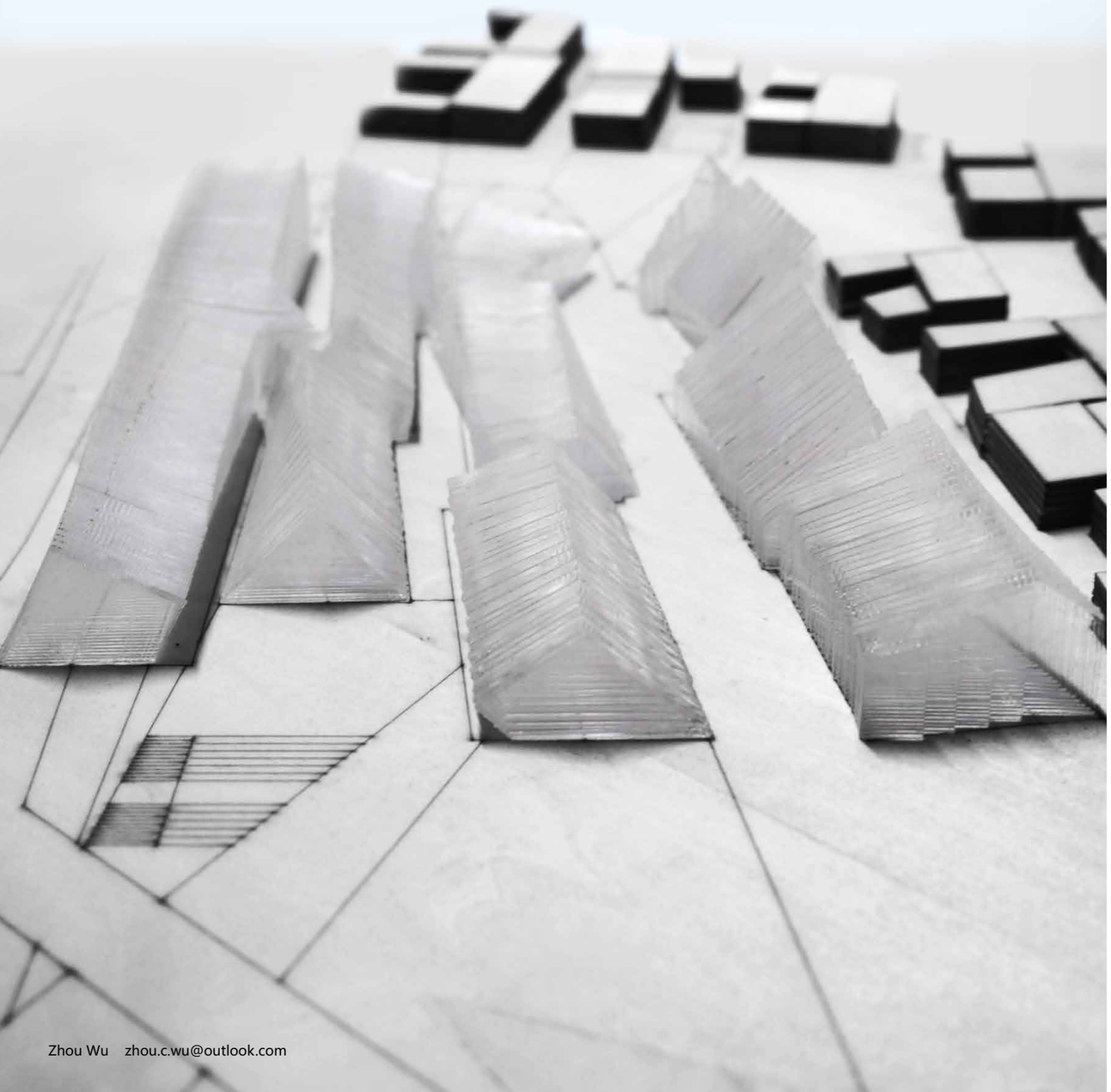
DEVELOPMENT PHASES & PROGRAMS



SECTIONS & PROGRAMS



Physical Model



05 EARTH TO CONCRETE

Folk Museum of Wulong Village

Chongqing University, Studio, Individual Work
Instructor: Huang Haijing
Spring 2017

Wulong is an ancient fishing village located in the outer suburbs of Kunming, next to Dianchi Lake. Due to the expansion of Kunming, the government gradually developed most of the land here into residential areas, schools, and factories. However, due to being classified as a protected area, Wulong Village will be preserved as a historical site next to the Dianchi Lake. Therefore, the heterogeneity of such a variety of urban forms has created the unique macro context of Wulong.

There is also a coexistence of history and modernity within Wulong Village. Old rammed earth buildings are built on the hills, while new concrete buildings are next to the road. The narrow strip from the Wulong mountain to the road is filled with the traces of the village's gradual development.

The project aims to extract four different architectural forms of four historical stages as elements and try to connect the history and the modernity at the end of the village. The building will transition from the original double-sloping roof to the modern flat roof, while the building will gradually become intact from the original broken. Along with the process of the tour, visitors will experience the life of the village from the past to the present with the museum's gradual transition from original to modern.

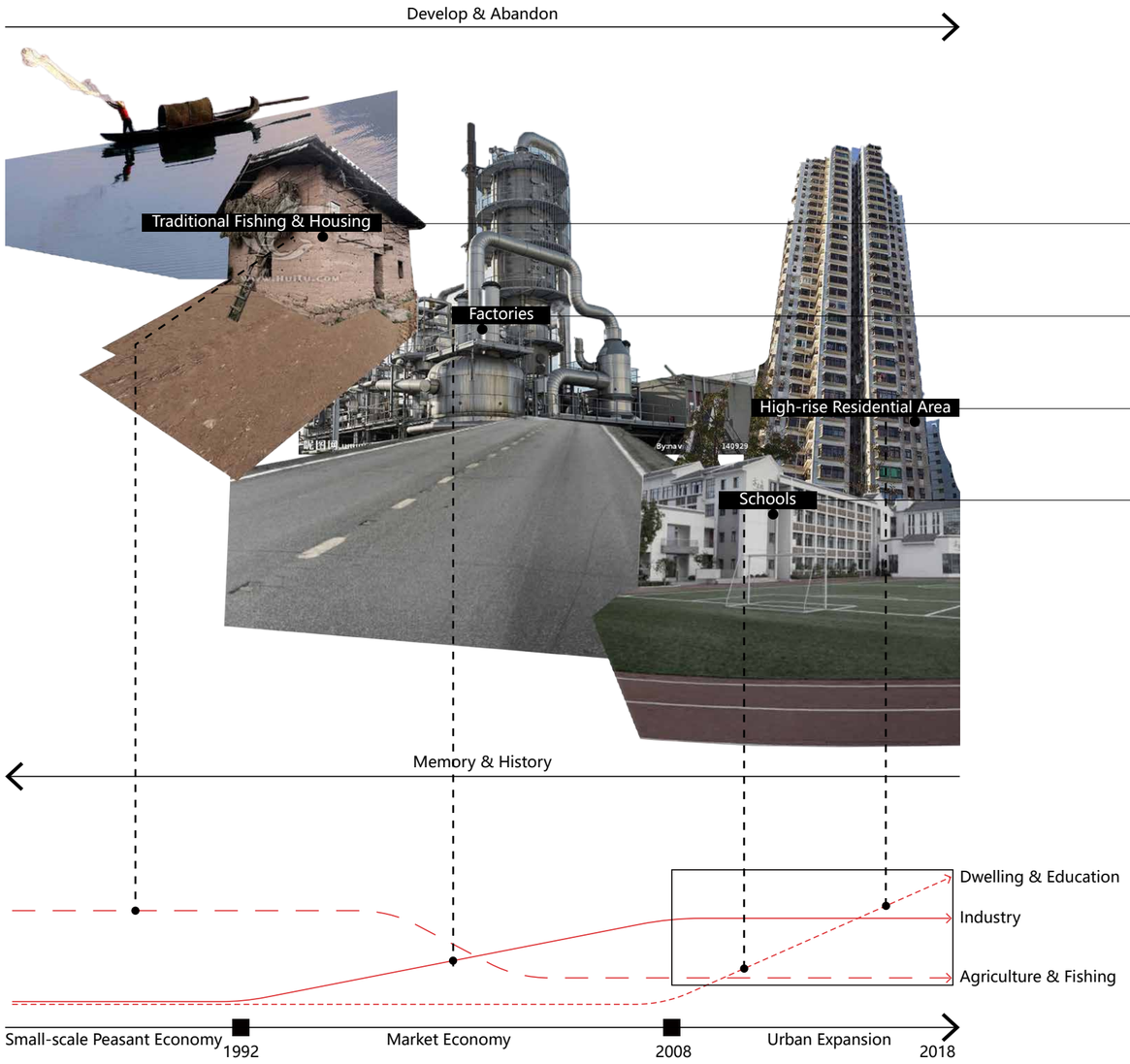
Zhou Wu zhou.c.wu@outlook.com

MACRO SITE CONTEXT | An Urban Chimera

Yunnan is an important province in the southwestern border of China, and it is rich in ethnic culture. Kunming is the capital of Yunnan Province which owns a lake of 330 km^2, named Dianchi. Dianchi lake has brought a pleasant climate of warm spring and cool summer to Kunming, which has made Kunming develop rapidly in recent decades and become a pearl of the southwestern border of China. The fast-growing city gradually surrounded the small village next to the Dianchi Lake. A variety of urban images are mixed here, forming an urban chimera.

Wulong is a lost village located just next to the Dianchi Lake. It was once home to the Dianchi fishermen. However, with the expansion of Kunming, Dianchi began to ban fishing. The villagers then had to give up their work and living environment and start to move toward the city. The original distinctive culture of this small village was gradually obscured by the light of the city.

Urban Development and Chimera



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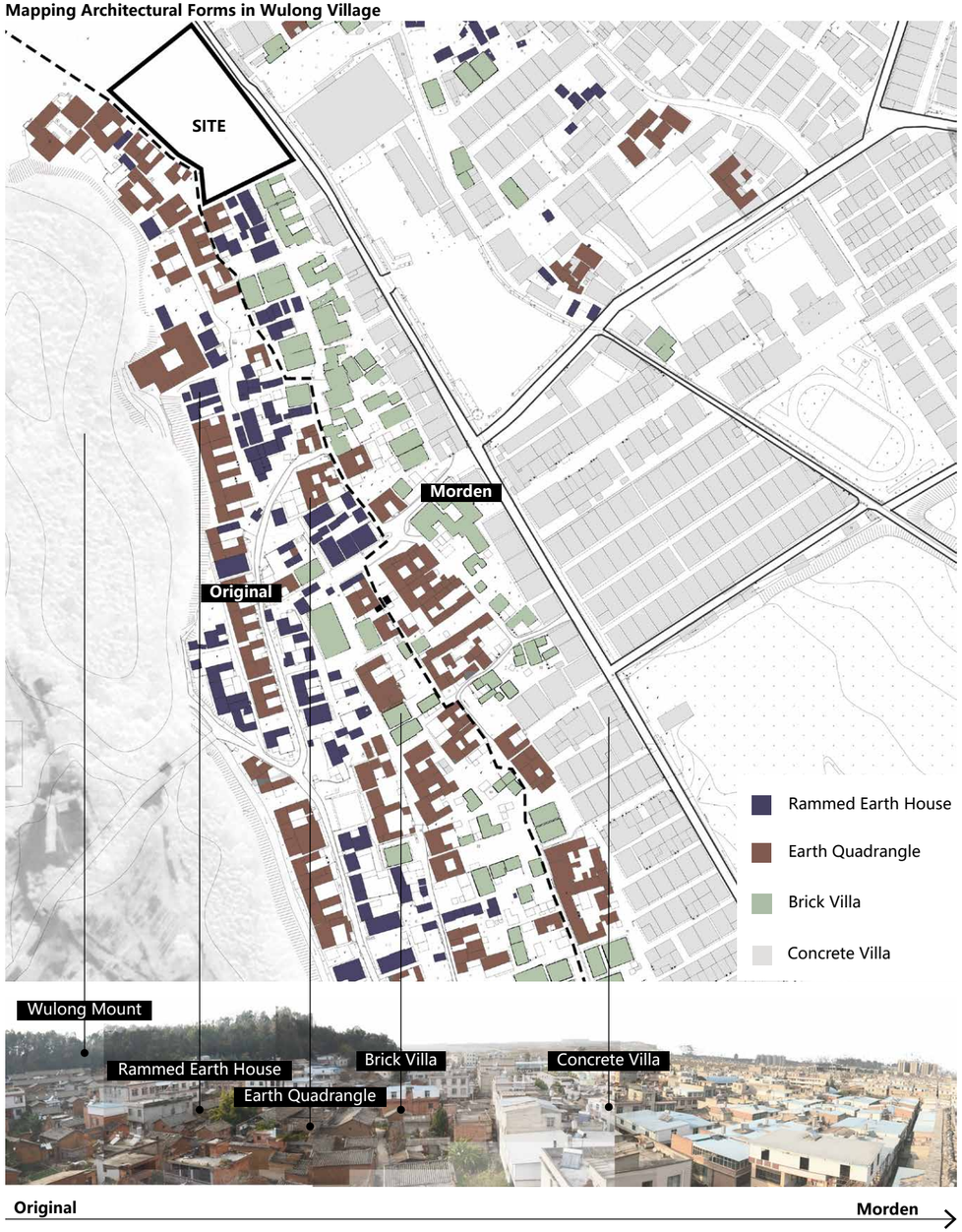
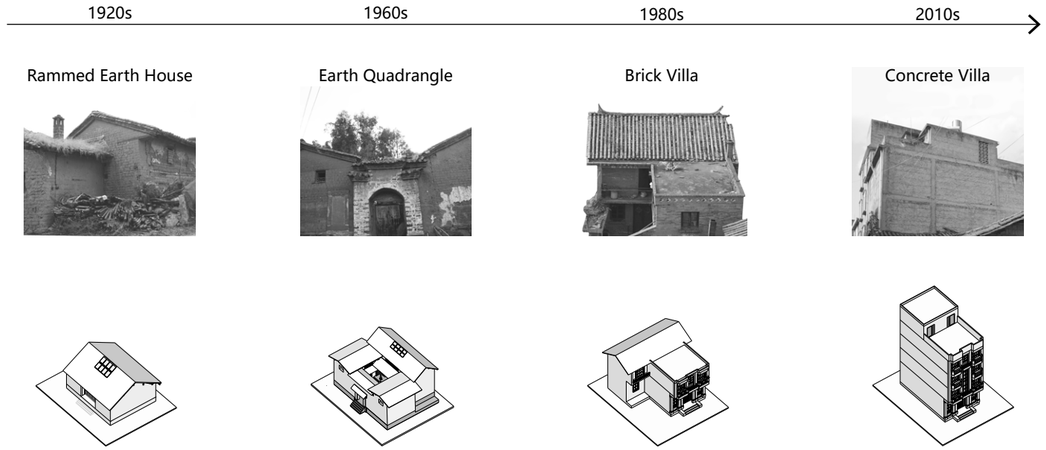
MEDIUM CONTEXT OF WULONG & DESIGN CONCEPT | A Developing Village

As urban civilization gradually invaded the village, the residential buildings which the villagers lived in for generations were also impacted by outside industrial civilization. Traditional bauxite buildings and small courtyards are mostly abandoned, replaced by reinforced concrete boxes.

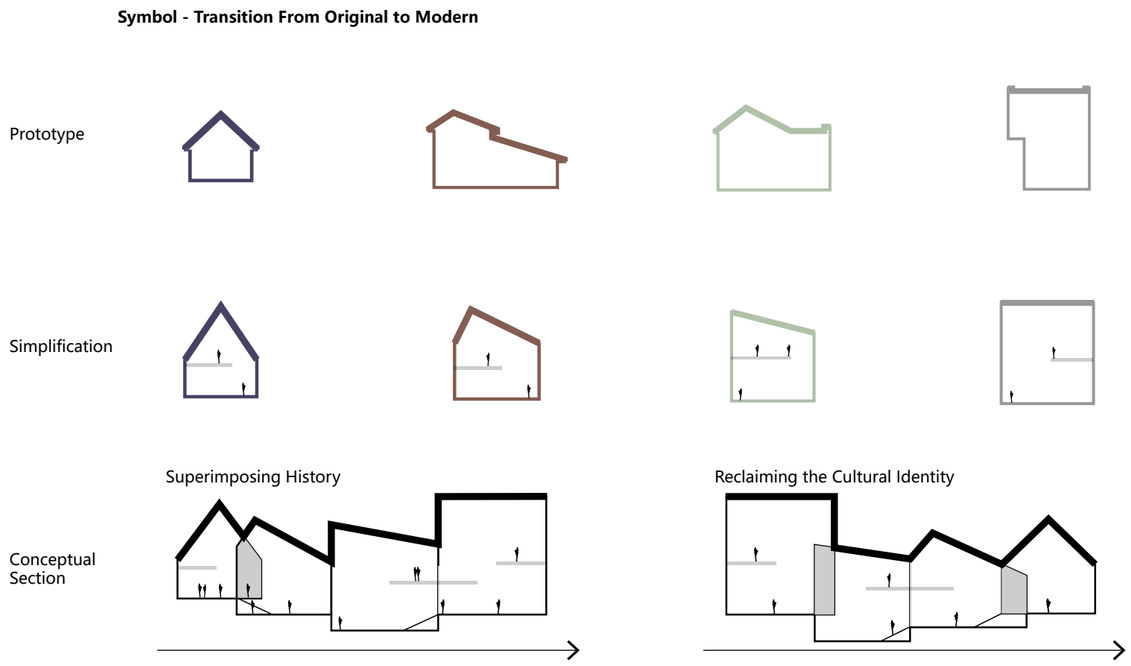
Mapping Architectural Forms in Wulong Village



Evolution of Architectural Forms



Symbol - Transition From Original to Modern



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SECTION & EXHIBITION ORGANIZATION

OLD EARTHENWARE QUADRANGLE
There is an old earthenware quadrangle being protected inside the museum.

ANCIENT CULTURE EXHIBITION HALL
This is the first exhibition hall of the museum. At here visitors will get a close look at the remains of a traditional culture that has been buried by history.

VILLAGE HISTORY EXHIBITION HALL
This is the second exhibition hall where visitors will observe and experience the development of this small village.

FUTURE DEVELOPMENT EXHIBITION HALL
The third exhibition hall, where visitors can learn about the rural development direction of the surrounding area of Wulong Village.

STAGE
The stage is located in the last exhibition hall of the building, where visitors can enjoy performances with local ethnic characteristics.

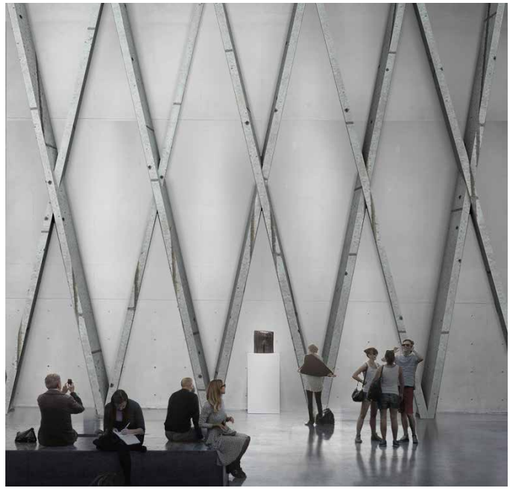
MULTIMEDIA EXHIBITION HALL
The entrance is hidden inside the village. Visitors will first perceive the current situation of the village and then enter the museum.

ENTRANCE
The entrance is hidden inside the village. Visitors will first perceive the current situation of the village and then enter the museum.

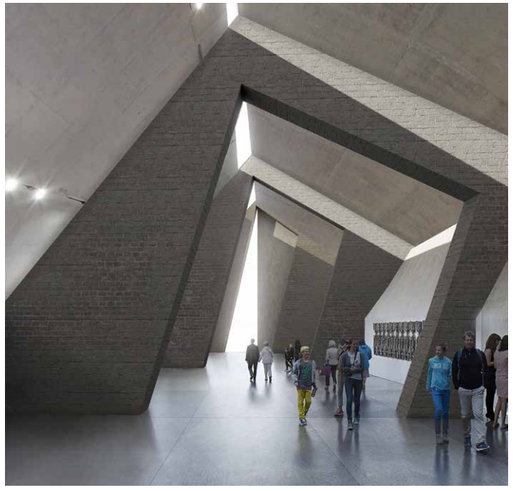
LOGISTICS ENTRANCE
The logistics entrance is hidden underground, separated from the main route by sight avoidance.

TRANSITION FROM ORIGINAL TO MODERN | Perspectives & Axon

2010s — 1980s — 1960s — 1920s



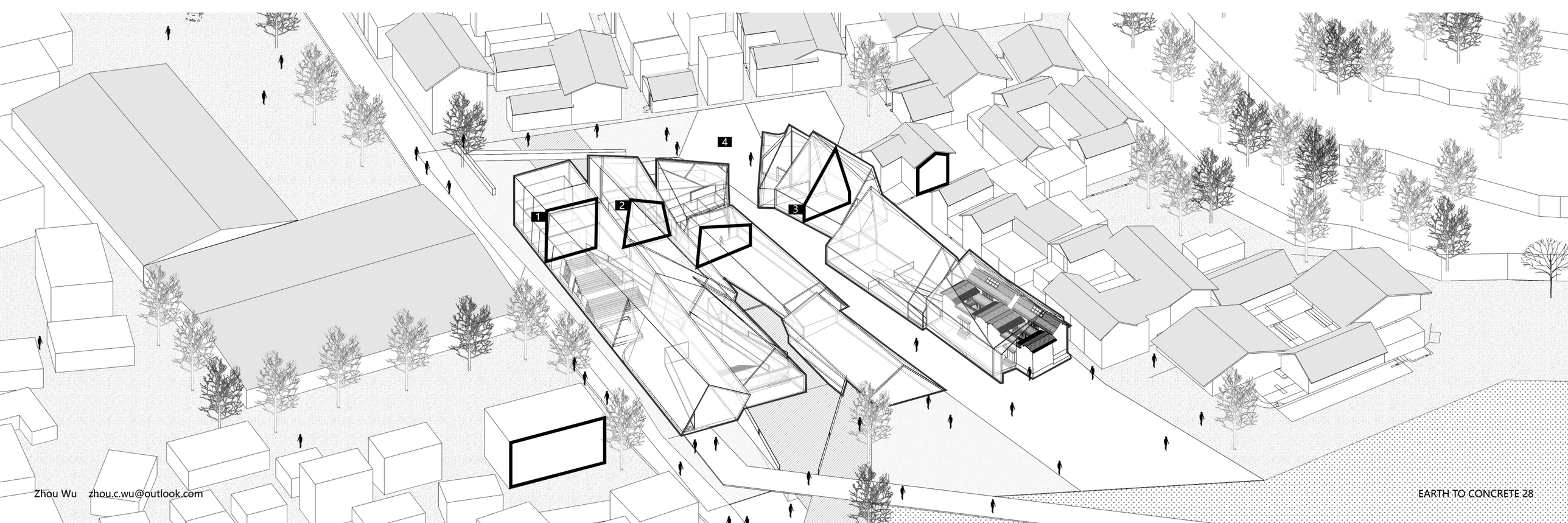
1 Multimedia Exhibition Hall



2 Village History Exhibition Hall

3 Ancient Culture Exhibition Hall

4 Entrance



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Outside Perspective
Standing at the end of Wulong Village, looking back, with the help of the past inheriting museum, the old village's rammed earth wall slowly changed into a modern appearance. This small fishing village's traditional culture which recorded in the rammed earth buildings can be extended into the large urban environment through the museum. Not only by the exhibitions, but also the museum itself.

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