

PORTFOLIO

year 4 semester 2

WALTER.L.MANCHWE

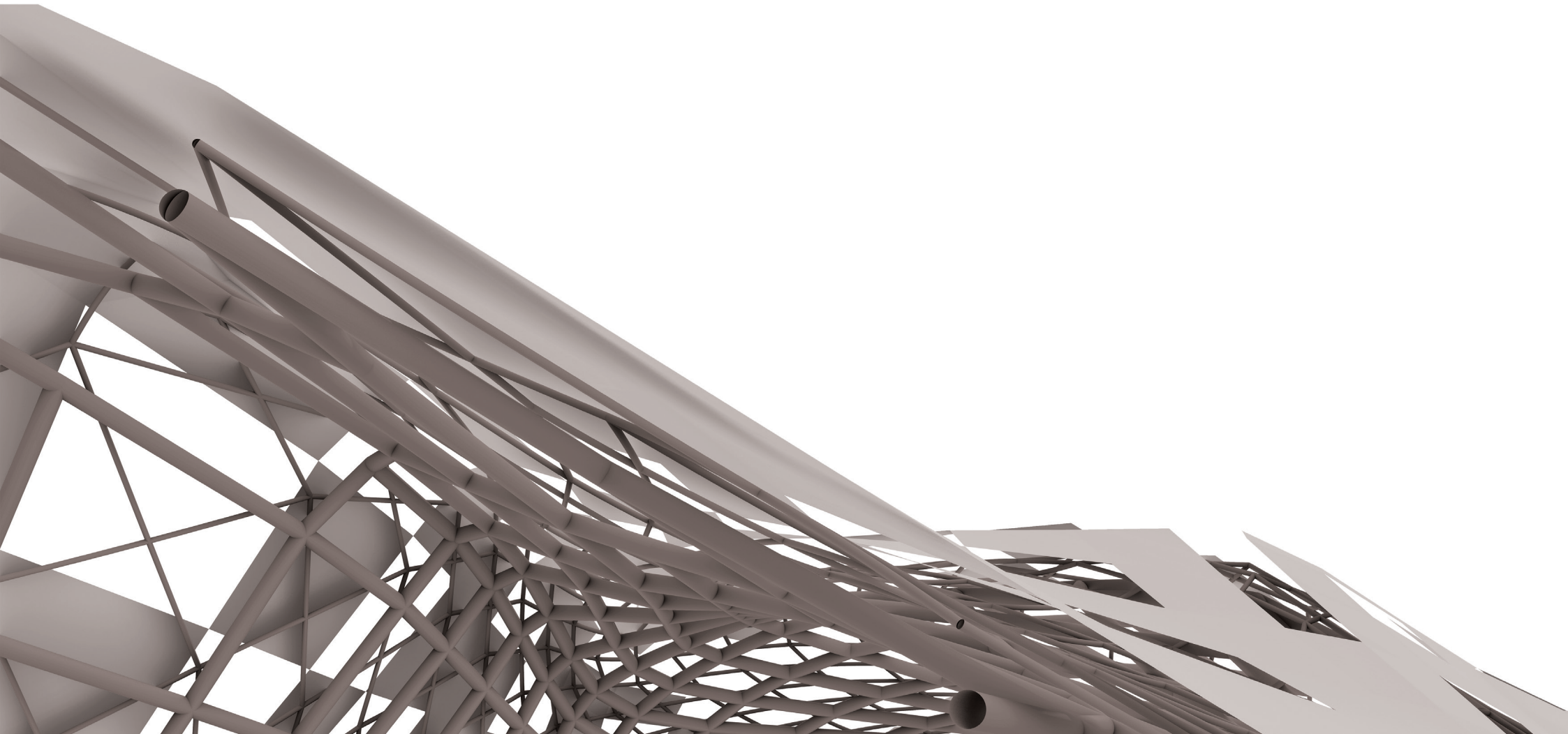


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THEME ANALYSIS

The premise of the studio this semester is anchored on revitalizing ecology and interrogating the delicate relationship between urban fabric and delicate ecological systems like rivers and wetlands. It is also aimed at how architecture can play a part in this.

UNDERSTANDING ECOLOGY

Ecology is the study of the relationships between living organisms and their physical environment: it seeks to understand the vital connections between plants and animals and the world around them

THE ROLE OF UNDERSTANDING ECOLOGY FOR HUMANS

The many specialties within ecology, such as marine, vegetation, and statistical ecology, provide us with information to better understand the world around us. This information also can help us improve our environment, manage our natural resources, and protect human health. The following examples illustrate just a few of the ways that ecological knowledge has positively influenced our lives.

REVIVING URBAN RIVER SYSTEMS

Urbanisation comes at a cost to rivers – they have been heavily degraded to enable development, carry waste, supply drinking water and facilitate transport and industry.

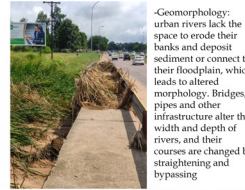
Effects of urbanisation on river:



-physical structure: artificial walls replace reed beds and natural river banks, or in many cases the river is hidden underground



-ability to support wildlife: natural corridors, riparian zones and in-channel habitats are lost



-Geomorphology: urban rivers lack the space to erode their banks and deposit sediment or connect to their floodplain, which leads to altered morphology. Bridges, pipes and other infrastructure alter the width and depth of rivers, and their courses are changed by straightening and bypassing



-removal of riparian vegetation: reduces organic input, habitat complexity, increases riverine temperature and reduces bank stability



-water quality: increased run-off from impervious surfaces such as roads, roofs and gardens, and contamination from industry discharges degrades water



-water quantity: decreased flow and reduced groundwater levels through abstraction and increased flow from surface run-off, increased



-invasive species: urban areas often suffer from introduced non-native species that become dominant and cause damage to the environment.

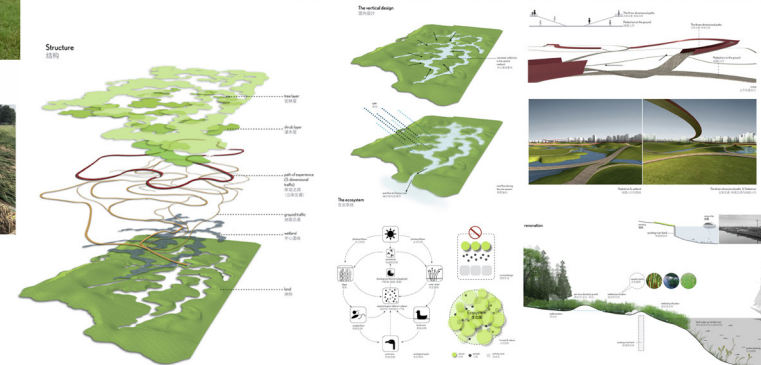
CASE STUDIES

The Qingpu Wetlands / logon architecture

FIRM: logon architecture
PROJECT: Qingpu Wetlands
LOCATION: Qingpu Shanghai



This proposal reflects a way to reverse the traditional dominating-dominated relationship of humans with nature. Elements are carefully planned to create an ecologically sustainable system with smallest financial investment and outside intervention possible. The park first develops plants, water, and land. Then, respectively around and between these elements, the Path of Experience, weaving up to 4m above ground, allows visitors and local residents an extraordinary experience.



TYPES OF ECOLOGY



Global Ecology
It deals with interactions among earth's ecosystems, land, atmosphere and oceans. It helps to understand the large-scale interactions and their influence on the planet.



Landscape Ecology
It deals with the exchange of energy, materials, organisms and other products of ecosystems. Landscape ecology throws light on the role of human impacts on the landscape structures and functions.



Ecosystem Ecology
It deals with the entire ecosystem, including the study of living and non-living components and their relationship with the environment. This science researches how ecosystems work, their interactions, etc.



Community Ecology
It deals with how community structure is modified by interactions among living organisms. Ecology community is made up of two or more populations of different species living in a particular geographic area.



Population Ecology
It deals with factors that alter and impact the genetic composition and the size of the population of organisms. Ecologists are interested in fluctuations in the size of a population, the growth of a population and any other interactions with the population.

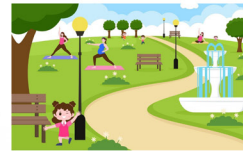


Organismal Ecology
Organismal ecology is the study of an individual organism's behaviour, morphology, physiology, etc. in response to environmental challenges. It looks at how individual organisms interact with biotic and abiotic components. Ecologists research how organisms are adapted to these non-living and living components of their surroundings.

BENEFITS



Improved flood management using more natural processes



Reconnecting people to the natural environment through urban regeneration

Reduced likelihood of negative impacts caused by climate change through

Better access for recreation and improved well-being

Enhanced habitats for wildlife.

ISLAND CITY PARK JAPAN

ARCHITECT: Toyo Ito, Hon
PROJECT: Island City Central Park, Grin Grin
LOCATION: Hakata Bay, Fukuoka Japan

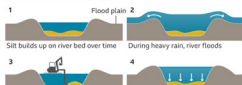


Located on reclaimed land on Hakata Bay, the structure locally known as Grin Grin serves as a greenhouse and public space on the west side of a large, multi-block park. The project is an undulating line of three interlocking column-free concrete shell structures, each of which has one or more elliptical skylights consisting of expansive, ventilated planes of glass. Visitors encounter climate-modified greenhouse spaces within that mimic tropical and subtropical environments, complete with a tropical aquarium and butterfly pavilion. The northern-most shell serves as an extensive, flexible gallery. The meandering trails, viewing platforms, flower beds, and grassy slopes that stretch across the roof extend the experience to include an appreciation of a locally attuned landscape.

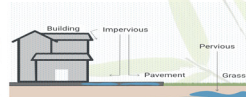


HOW TO REMEDY RIVER FLOODING

How dredging works



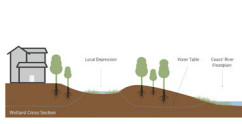
1 Silt builds up on river bed over time
2 During heavy rain, river floods
3 Diggers or vacuum pumps can be used to remove silt and increase river capacity
4 But after an extreme flood, river accumulates more silt as flow slows down



RAIN GARDENS
Rain gardens reduce flash flooding by collecting rainwater and allowing time for the water to be



MANGROVES
Mangroves are a species of tree with an extensive root system that slows down wave action, moving water



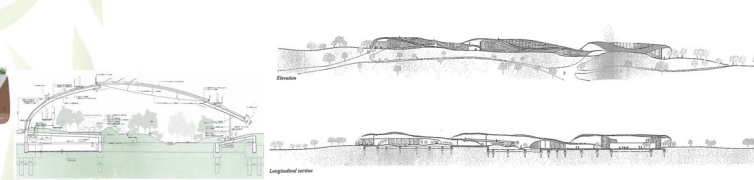
MARSH & WETLAND
Restoring or constructing new marsh or wetlands provides areas for water to be stored, therefore reducing flooding.



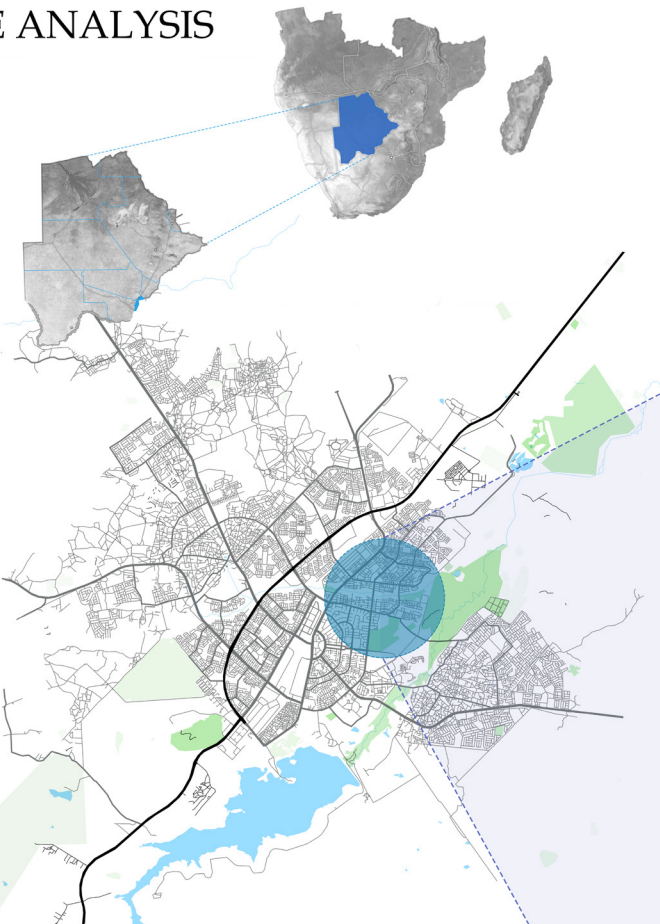
BIOSWALES
Bioswales are larger but functionally similar, and usually a part of a larger stormwater drainage system



DETENTION BASINS
Detention basins are an area meant to store water to protect against flooding for a limited period of time.



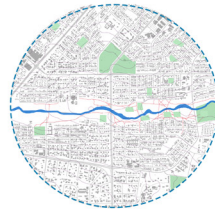
SITE ANALYSIS



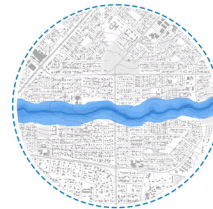
NOLI MAP
Highlighting the grain arrangement in and around the river



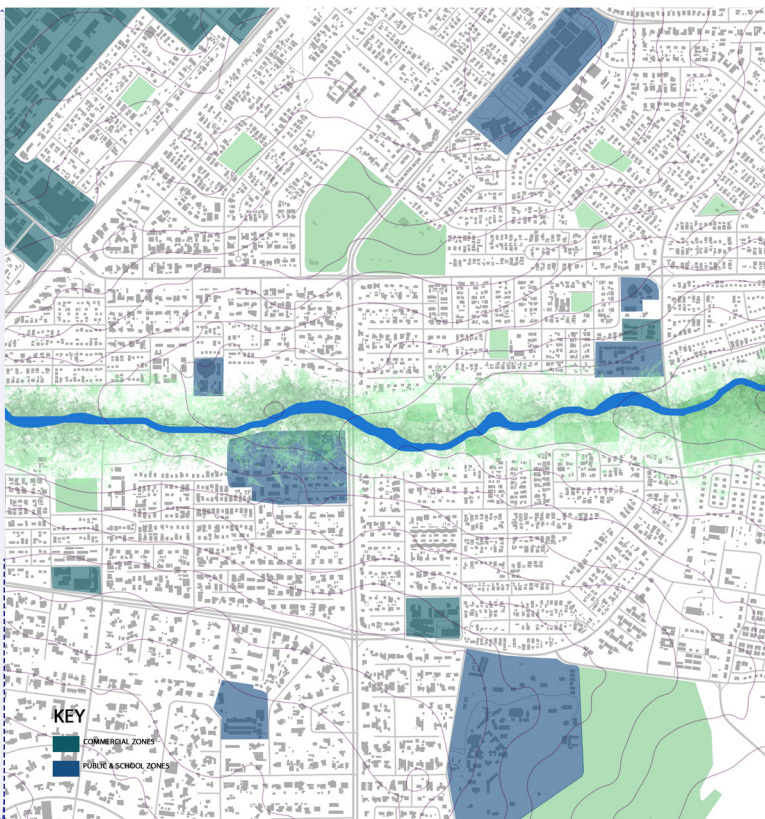
ROAD MAP
Highlighting the grain arrangement in and around the river



PEDESTRIAN MOVEMENT
Pedestrian movement in conjunction with the road network and the open spaces in and around the river.



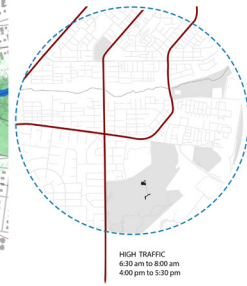
FLOOD LINES/LEVELS
The different levels of the river in flood scenarios.



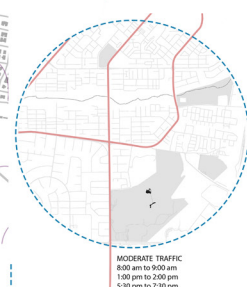
KEY
COMMERCIAL ZONES
PUBLIC & SCHOOL ZONES



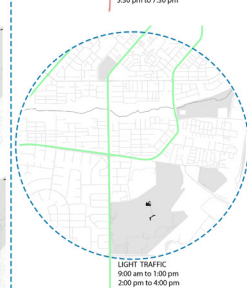
GREEN FINGERS
Highlighting the overlap of steam paths and urban circulation.



HIGH TRAFFIC
4:30 am to 8:00 am
4:00 pm to 5:30 pm



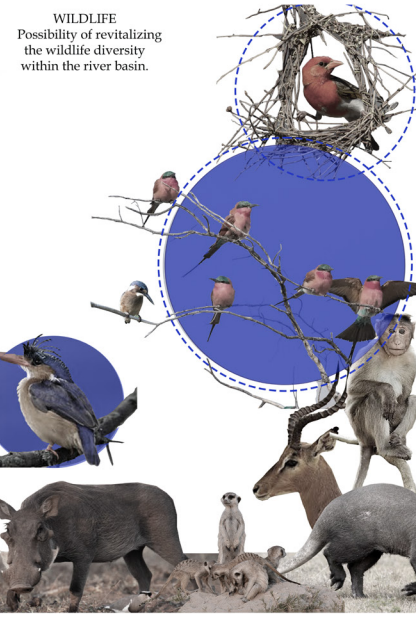
MODERATE TRAFFIC
8:00 am to 9:00 am
1:00 pm to 2:00 pm
5:30 pm to 7:30 pm



LIGHT TRAFFIC
9:00 am to 1:00 pm
2:00 pm to 4:00 pm
1:30 pm to 5:00 pm



BAMBOO FARMING
Possibility for bamboo farming and processing by the adjacent neighbourhoods & communities



WILDLIFE
Possibility of revitalizing the wildlife diversity within the river basin.



SITE PROBLEMS/ ISSUES

- Flooding
- Poor stormwater management
- Pollution of river water
- Poor pedestrian connectivity over the river
- Safety
- Vehicular movement

ACTIVITIES ON SITE

RECREATION

Football played in the neighbourhood and open spaces

Football tables

Football tables

COMMUNITY / GATHERING

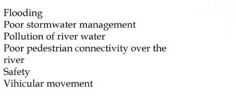
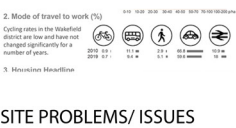
Community gathering spaces

COMMERCIAL

Commercial buildings and shops

PUBLIC TRANSPORT ROUTES

Public transport routes and stations

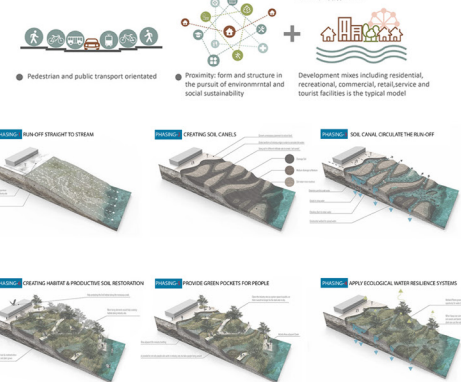


STRATEGY

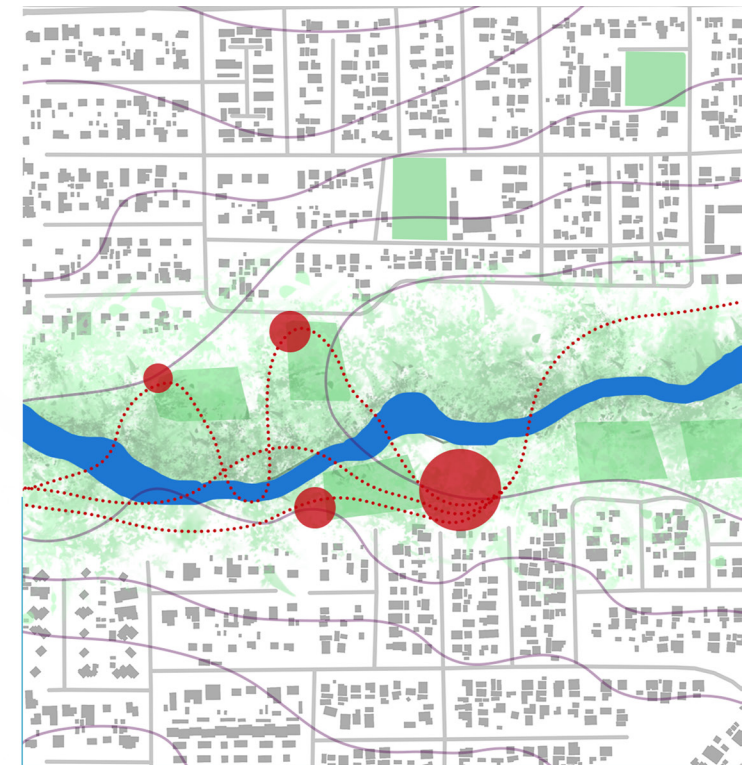
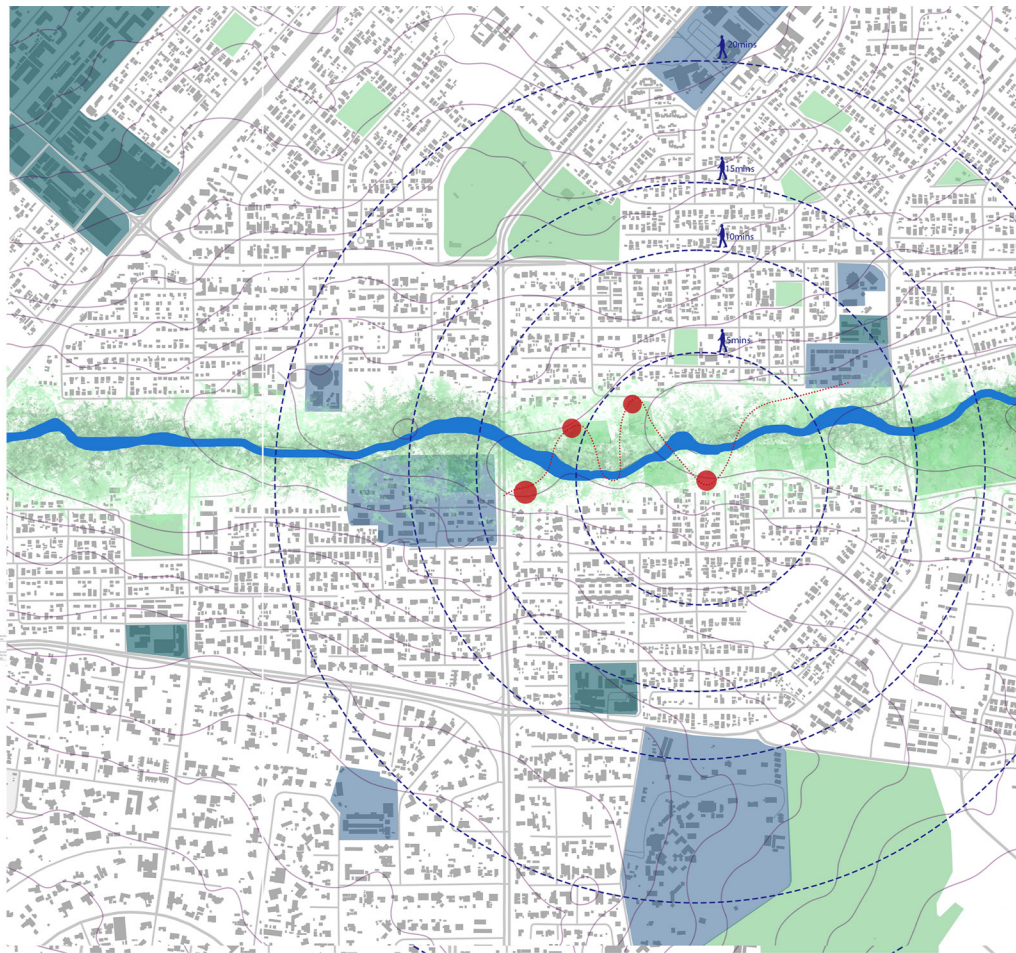
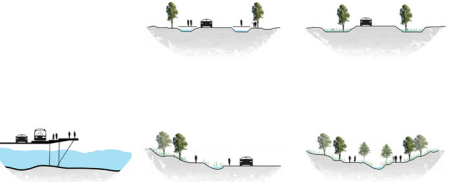
THE STRATEGY aims to revitalize the Segoditshane river valley by way of flood control, rebuilding the ecology, bridging the communities knowledge on ecology all the while injecting life and lively hood in the neighbouring community anchoring on sustainable architectural principals.

WATERFRONT CITY THEORY

John A. Carr, 1986. Urban waterfront regeneration: how to bring a city back to life. Planning Practice & Research, 1(3), pp.23-42



GREEN FINGER INTAVENTION

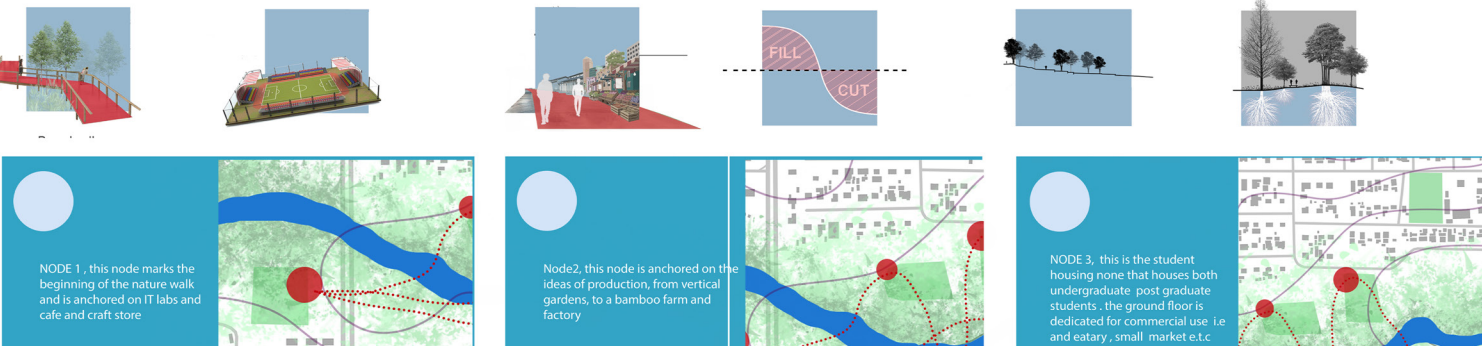


BRIEF

The building is aimed at being an ecological education centre that aims to help research and educate the population on ecological and environmental subject matters by way exhibition, research and education

PART I

The part is a curvilinear roofscape that peels from the landscape, overlooking the river.

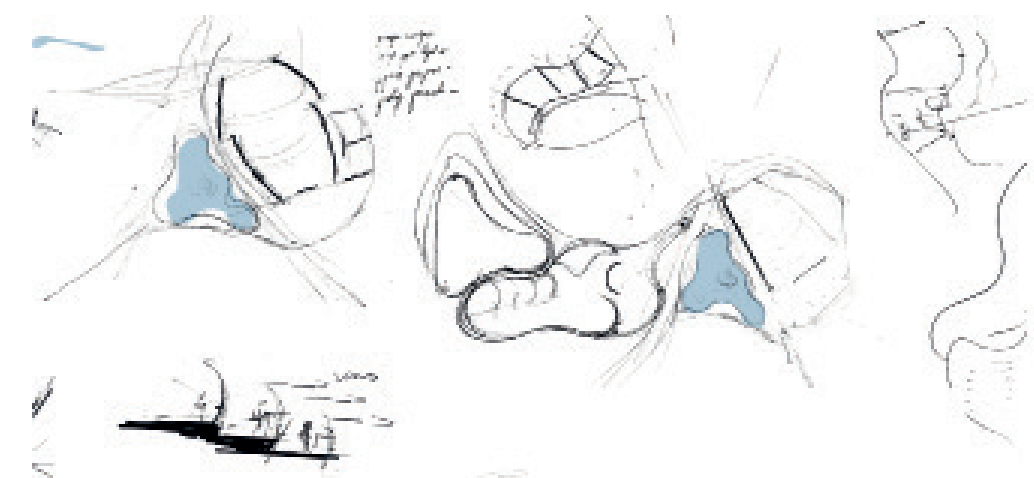
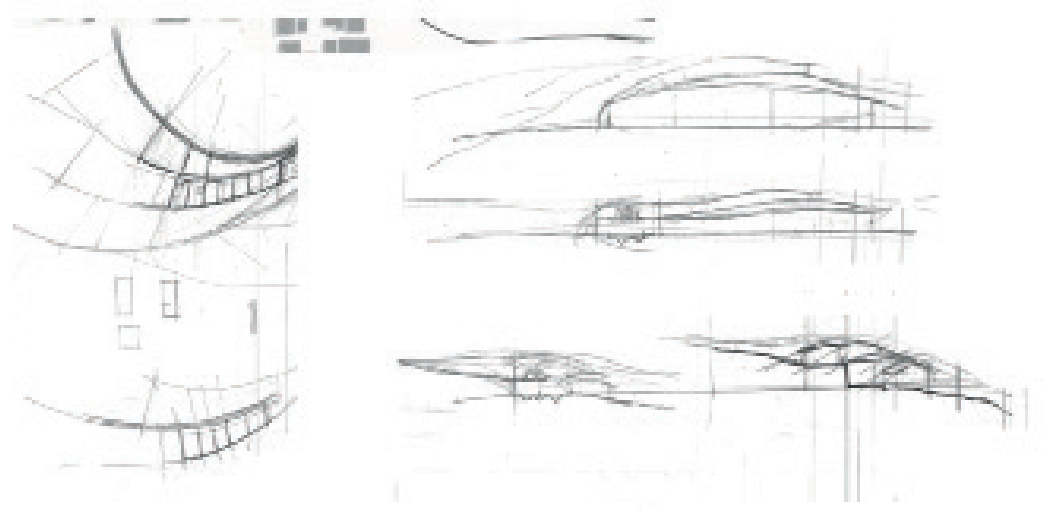
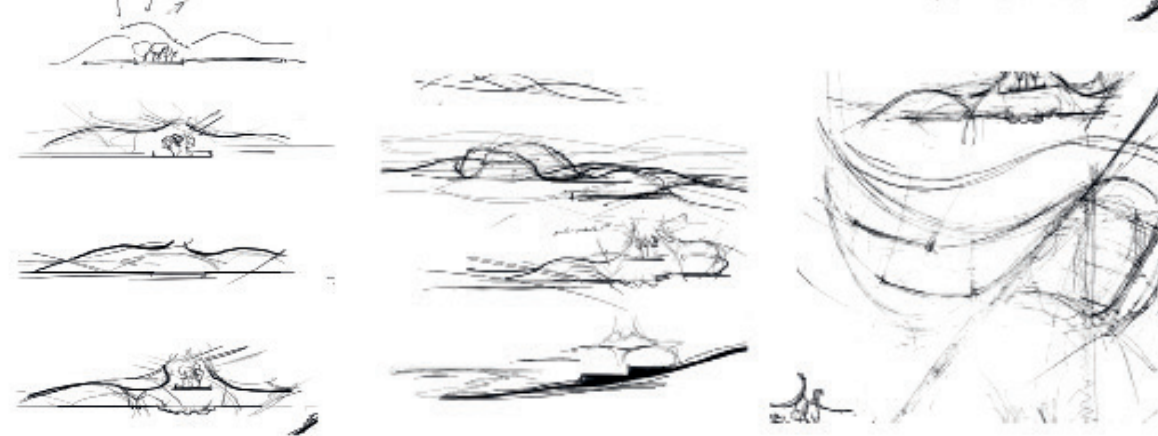
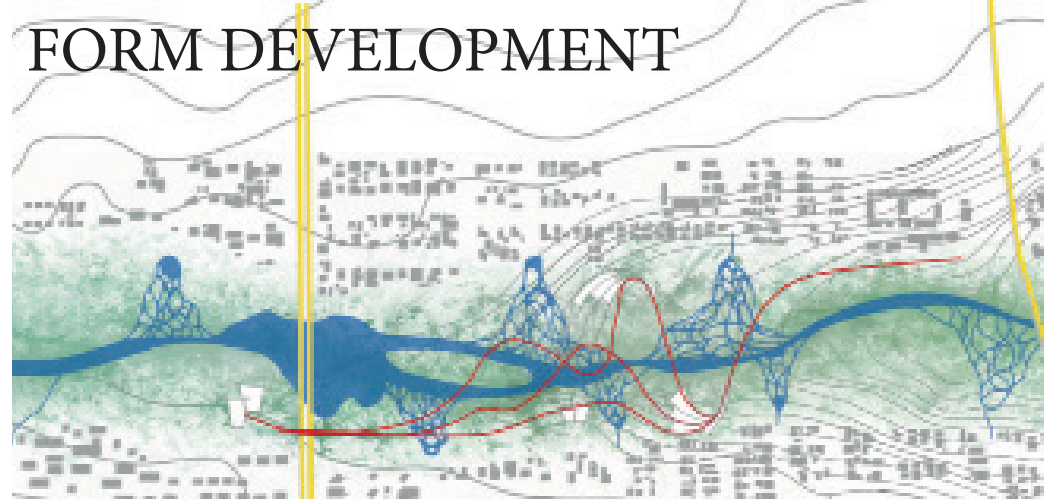


PROGRAM OF SPACES

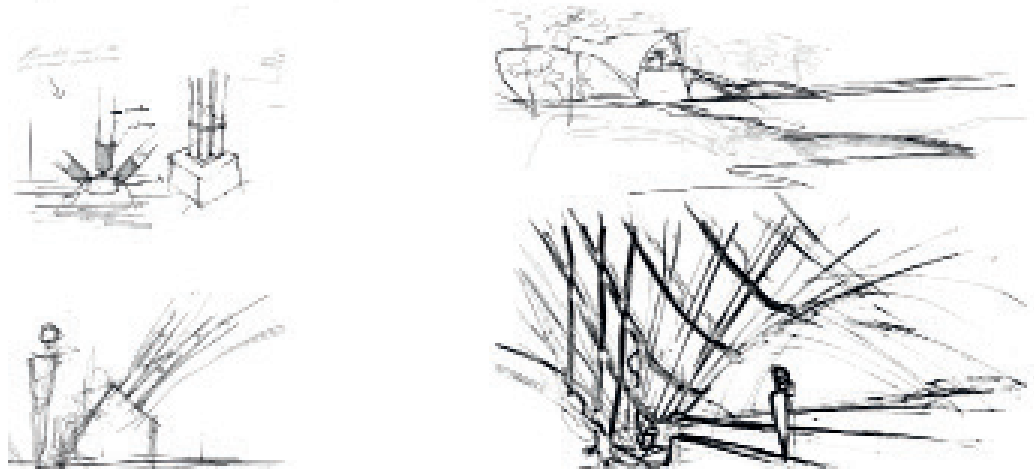
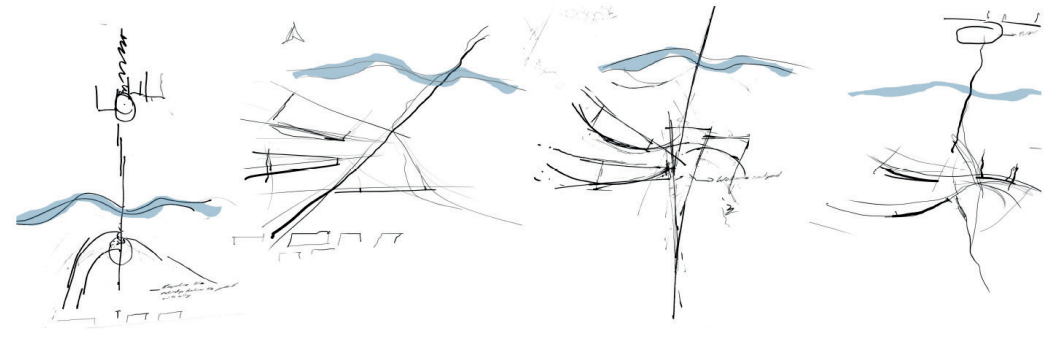
NODE	CATEGORY	SPACES	NUMBER OF USERS	AREA m ²
EDUCATIONAL CENTRE	EXHIBITION	AUDITORIUM	250	300
		GALLERY	200	200
	SUPPORTING SPACES	PLANTING GARDENS	250	400
		RESEARCH LAB	15	90
		DI. MENTORAGE EMPLOYEES LAB	45	150
		DI. SEMINAR SPACES	45	75
	ADMINISTRATION	STORAGE	8	50
		RECEPTION/RECEPTION ROOM	27	25
		ENTRANCE AND STAFF ROOM	8	20
		MEETING ROOM	18	40
		OPEN PLAN OFFICES	0	50
		MANAGERS OFFICE	1	24
SERVICES	RESTROOMS	8	50	
	CIRCULATION	PARKING AND CORRIDORS		
COMMUNITY OUTREACH	CRAFT	MULTIFUNCTIONAL SPACE	150	200
		DIY WORKSHOPS	5	300
	SERVICES	STORAGE	8	50
		ABILITIES	50	50
CIRCULATION	PARKING AND CORRIDORS			

CATEGORY	SPACES	NUMBER OF USERS	AREA m ²		
STUDENTS	COMMERCIAL	CAFETERIA/RESTAURANT	50	70	
		LAUNDRY	15	50	
	SHARED STUDENT SPACES	CORNER STORE	15	50	
		LIBRARY	40	50	
	ACCOMMODATION	5X STUDY ROOMS	6	100	
		50X UNDERGRADUATE STUDENTS	3	1400	
	SERVICES	20X GRADUATE STUDENTS	2	1500	
		ABILITIES			
	CIRCULATION	PARKING AND CORRIDORS	WAITING ROOM	15	50
			RECEPTIONIST & FRONT	5	30
STUDENT WELFARE CENTRE		RECEPTION	4	44	
		RECEPTION			
EDUCATIONAL	FARMING	BACKWOOD FARMS			
		URBAN FARMING			
	COMMERCIAL	VERTICAL GARDENS			
		PARKING			
WATERPARK	GREY WATER TREATMENT				
	WATERPARK				

FORM DEVELOPMENT



SEARCHING FOR FORM

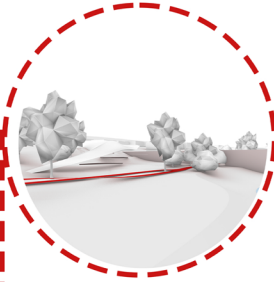


MASTER PLAN

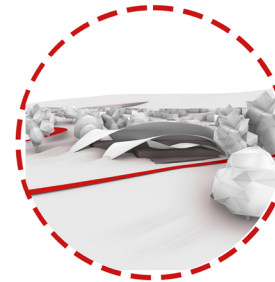
NODE 1 this node marks the beginning of the nature walk and is anchored on IT labs and cafe and craft store



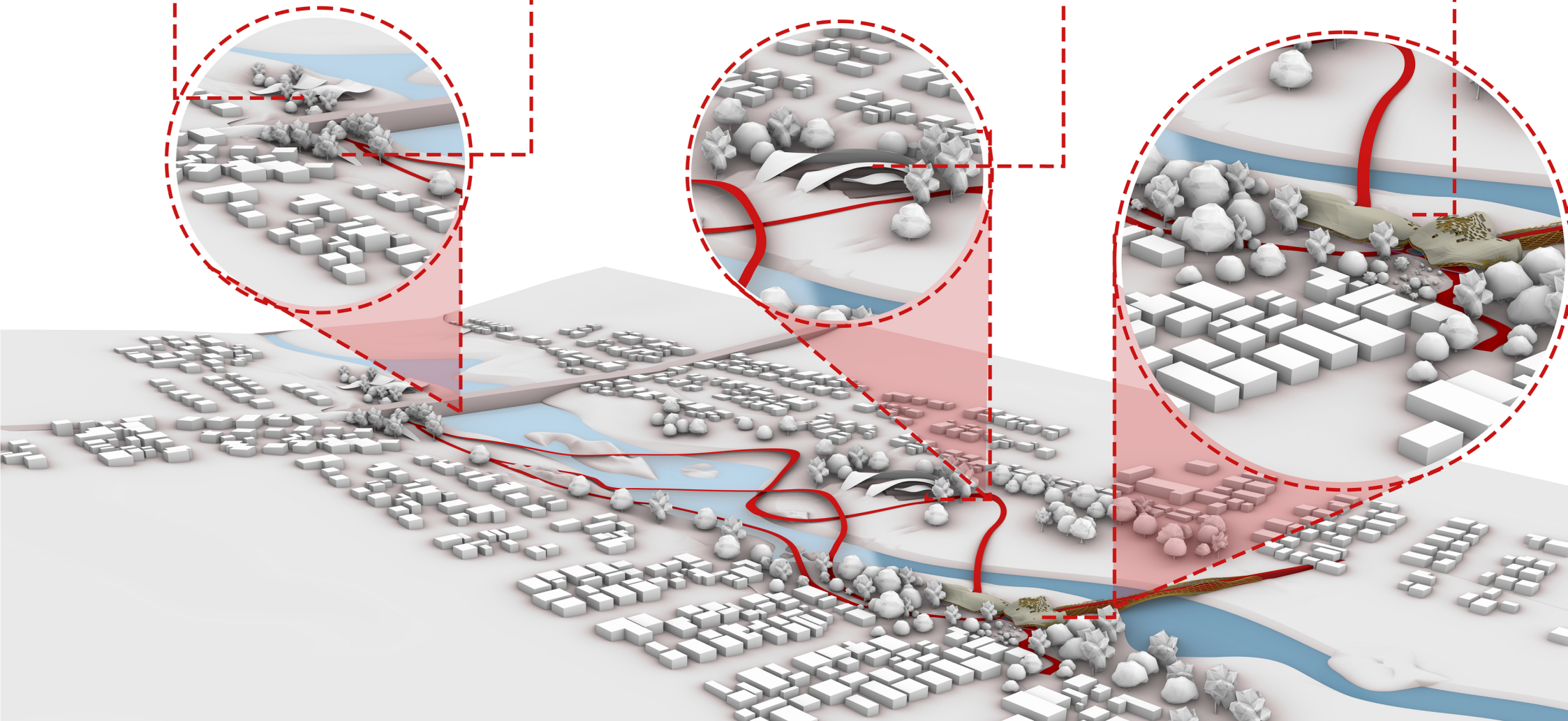
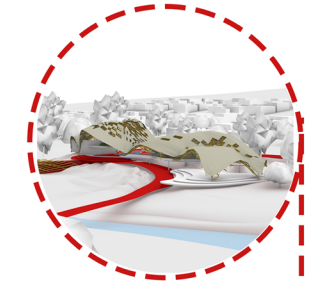
NODE 2, this node is anchored on the ideas of production, from vertical gardens, to a bamboo farm and factory



NODE 3 this is the student housing zone that houses both undergraduate post graduate students. the ground floor is dedicated for commercial use i.e and eatary , small market e.t.c

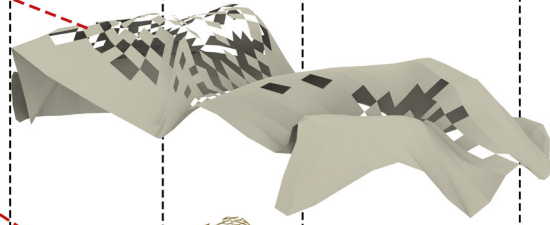


NODE 4
The building is aimed at being an ecological education centre that aims to help research and educate the population on ecological and environmental subject matters by way of exhibition, research and education

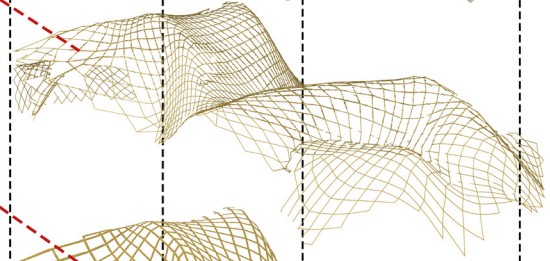


MARUAPULA ECOLOGICAL EDUCATION CENTRE

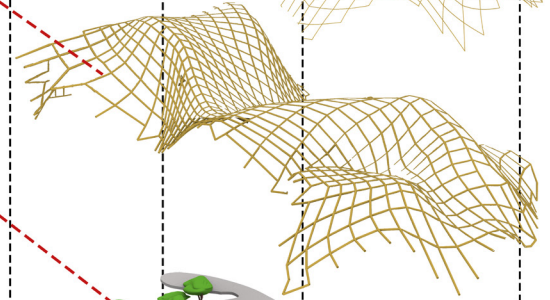
BAMBOO ROOF



BAMBOO SUB-STRUCTURE

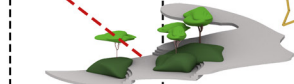


BAMBOO MAIN STRUCTURE



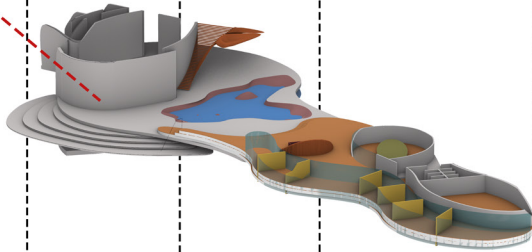
1ST FLOOR

-floating garden



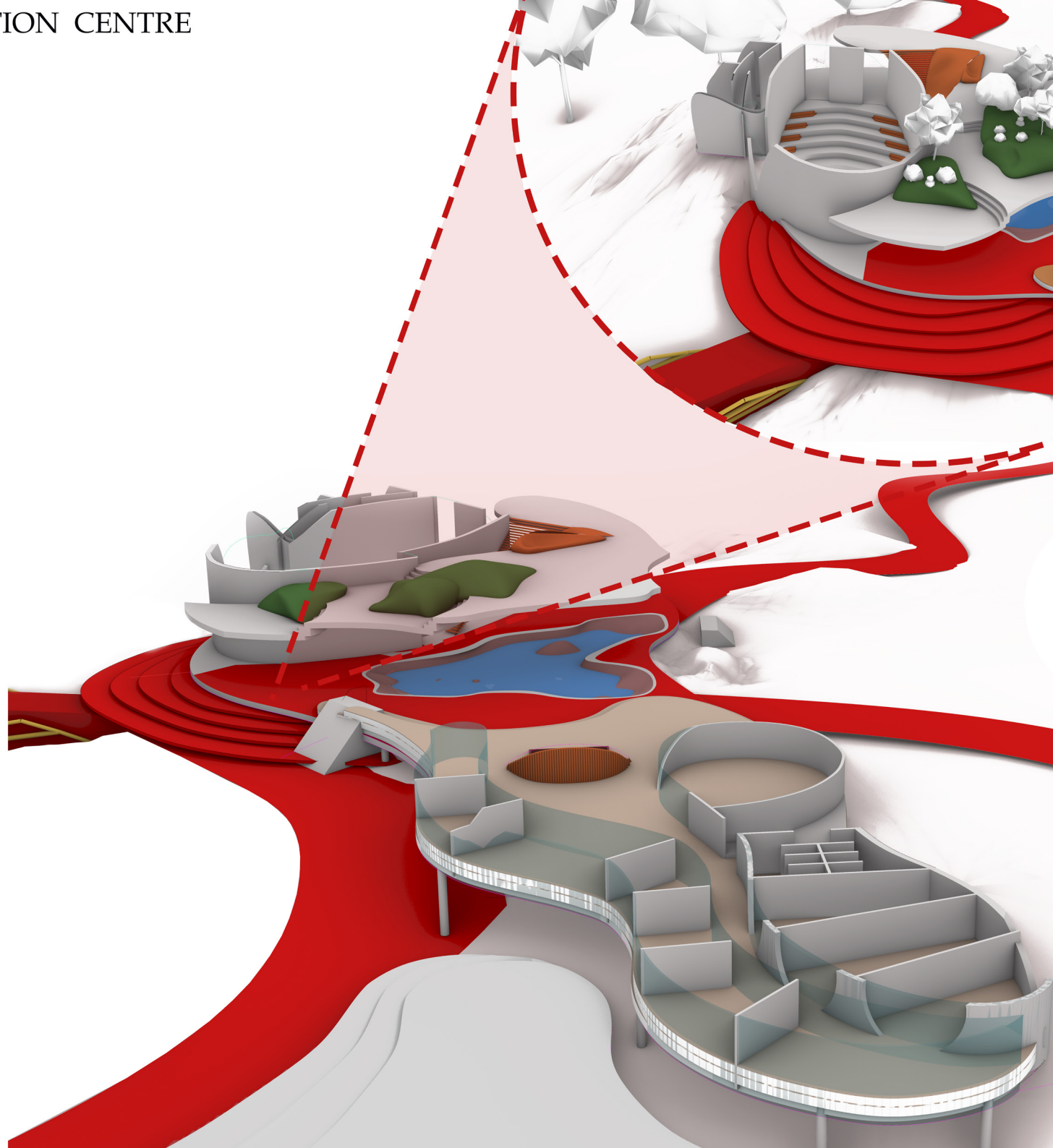
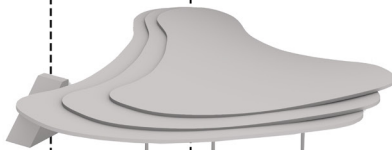
GROUND FLOOR

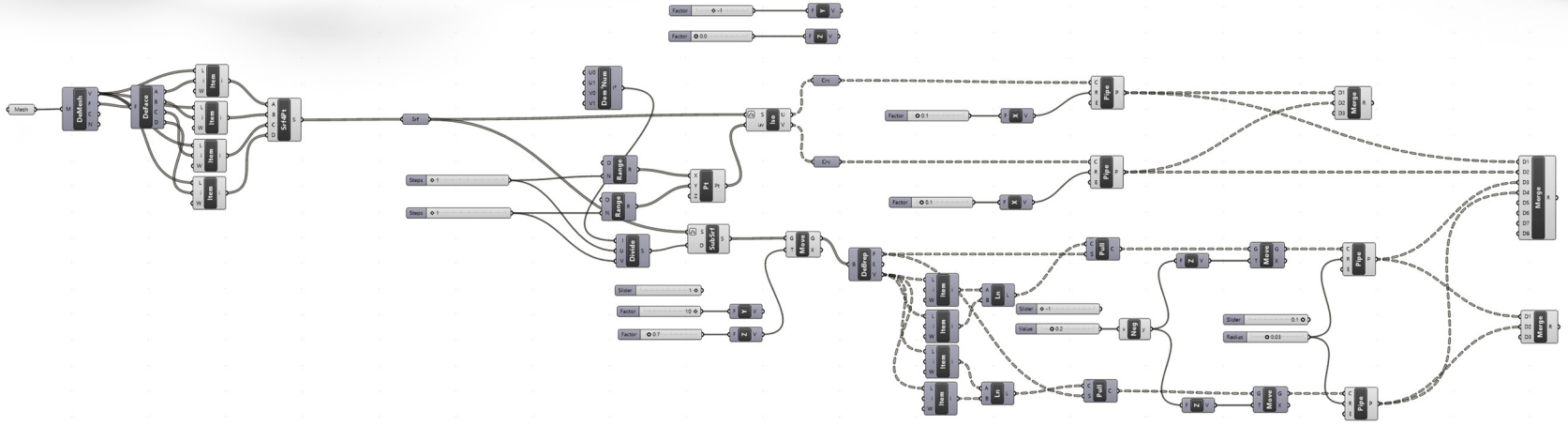
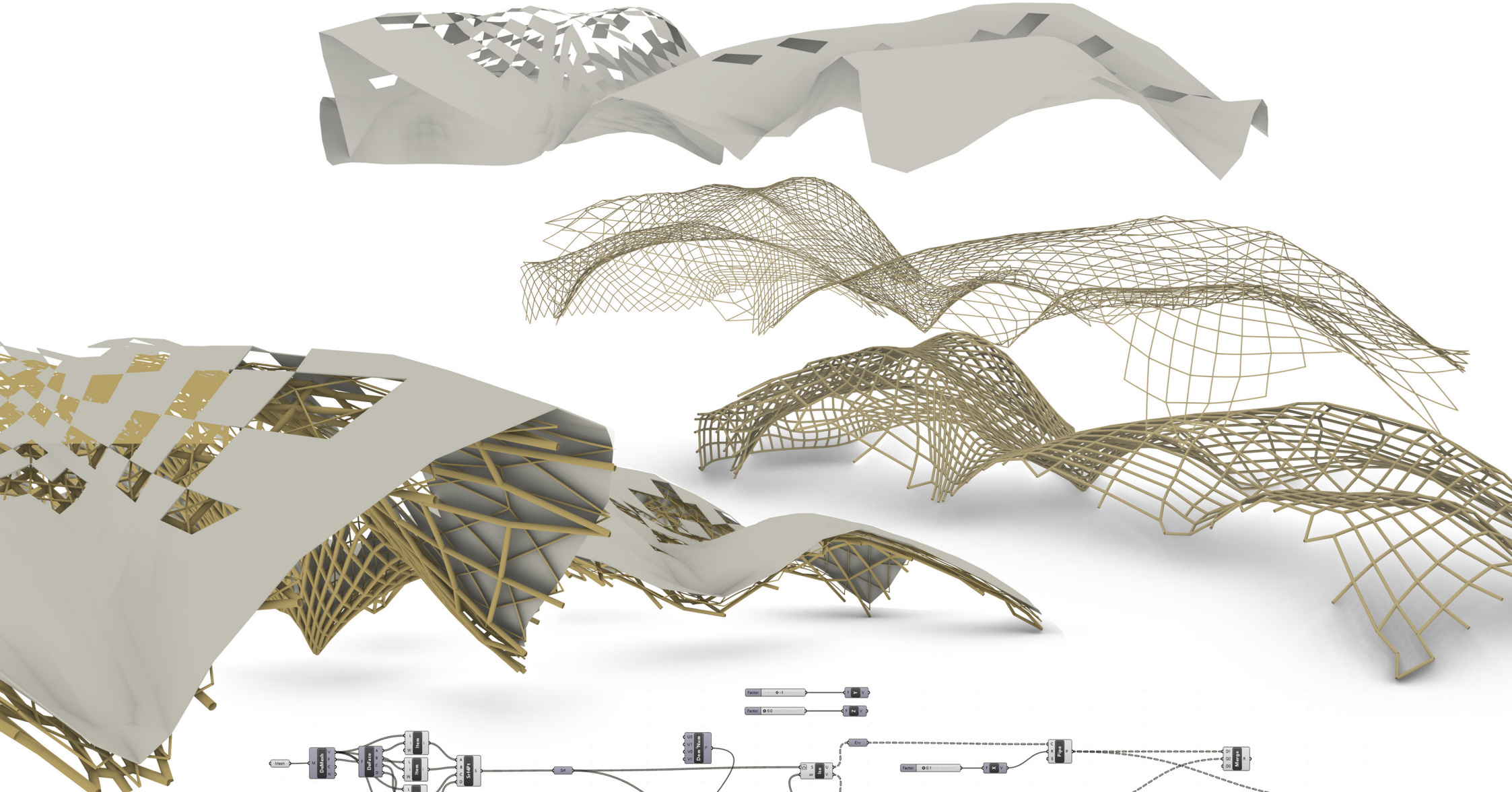
-Indoor auditorium
-interior court
functioning as a
-foyer/lower level of
the winter garden
-Admin level
Educational labs



FOUNDATION/ ground connection

-representation of how
the building and the
roof meet the ground.
- floating the building
to protect it from
flooding.





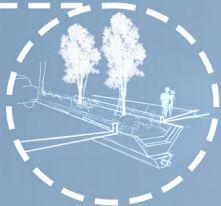


AREAL VIEW

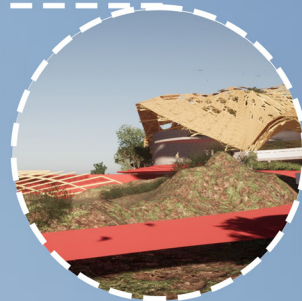
-Facing North

-showing how the pedestrian walkways transition from the residential/urban context through a layer of ecology towards the design

GREEN FINGER
PROPOSALS AND
INTERVENTIONS



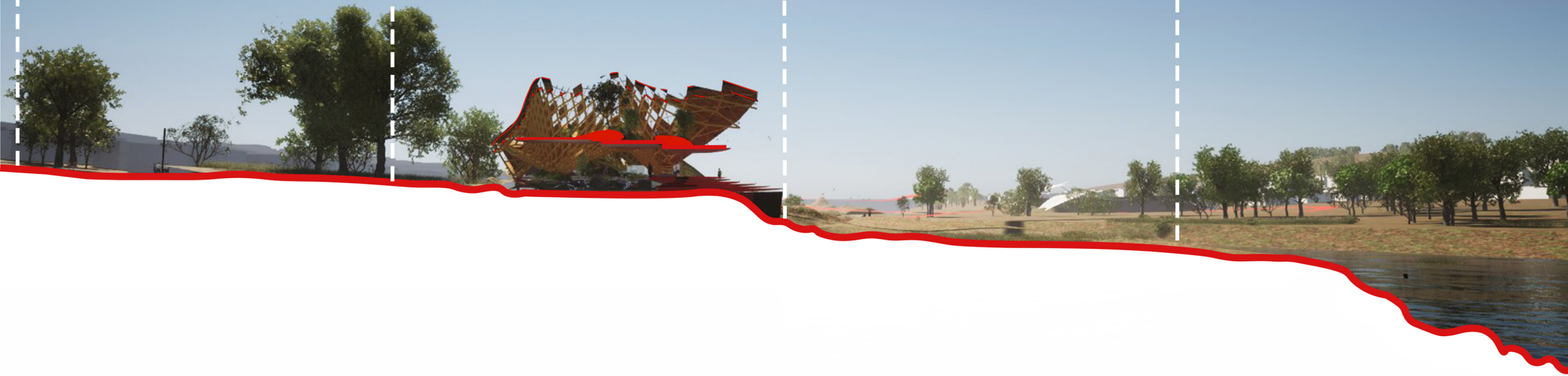
ECOLOGICAL PARK BETWEEN
THE URBAN CONTEXT AND
THE SITE
-For recreation and entertainment
by the community.



BURM & DETENTION PONDS
-to protect the building from floods
*the detention ponds are designed
to fill up and hold water in the case
that the river floods/the water level
rises before getting to the building.



GREENFINGER, WETLAND &
RIVER JUNCTION
-where all 3 elements meet
- this is a turbulent junction and the
wetland is set in place to reduce the
rate of water flow to make it more
calm seamless.

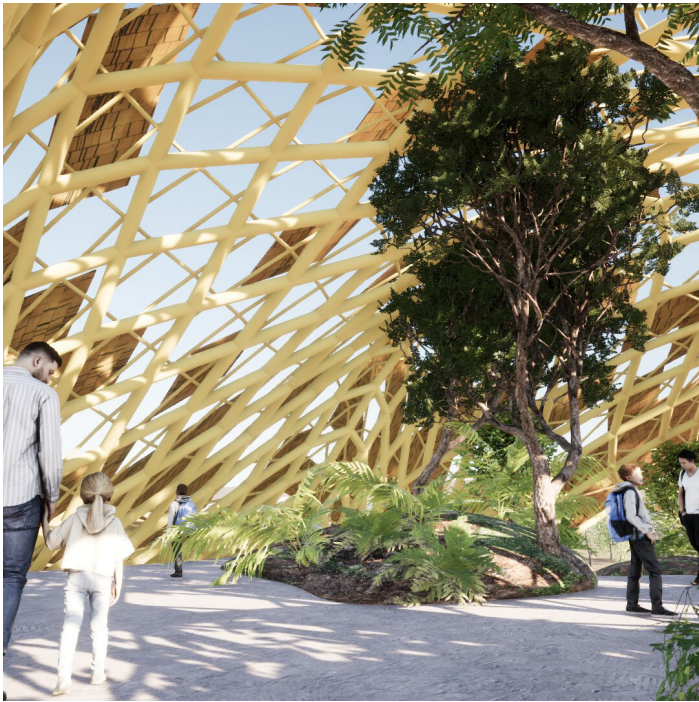


MAIN ARRIVAL

-the play on horizontal
planes to draw people
into the building

-the perforated roof layer
defuses the intensity of
the solar radiation that
reaches the plants on the
1st floor winter garden





1ST FLOOR

-the floating garden functions as a winter garden escape space than exhibits different types of ecology.



GROUND FLOOR

-FOYER/ COURTYARD

- this is a welcome courtyard that welcomes all the pedestrian paths that intersect at this junction . It also allows for a seamless transition into the interior spaces



GROUND FLOOR

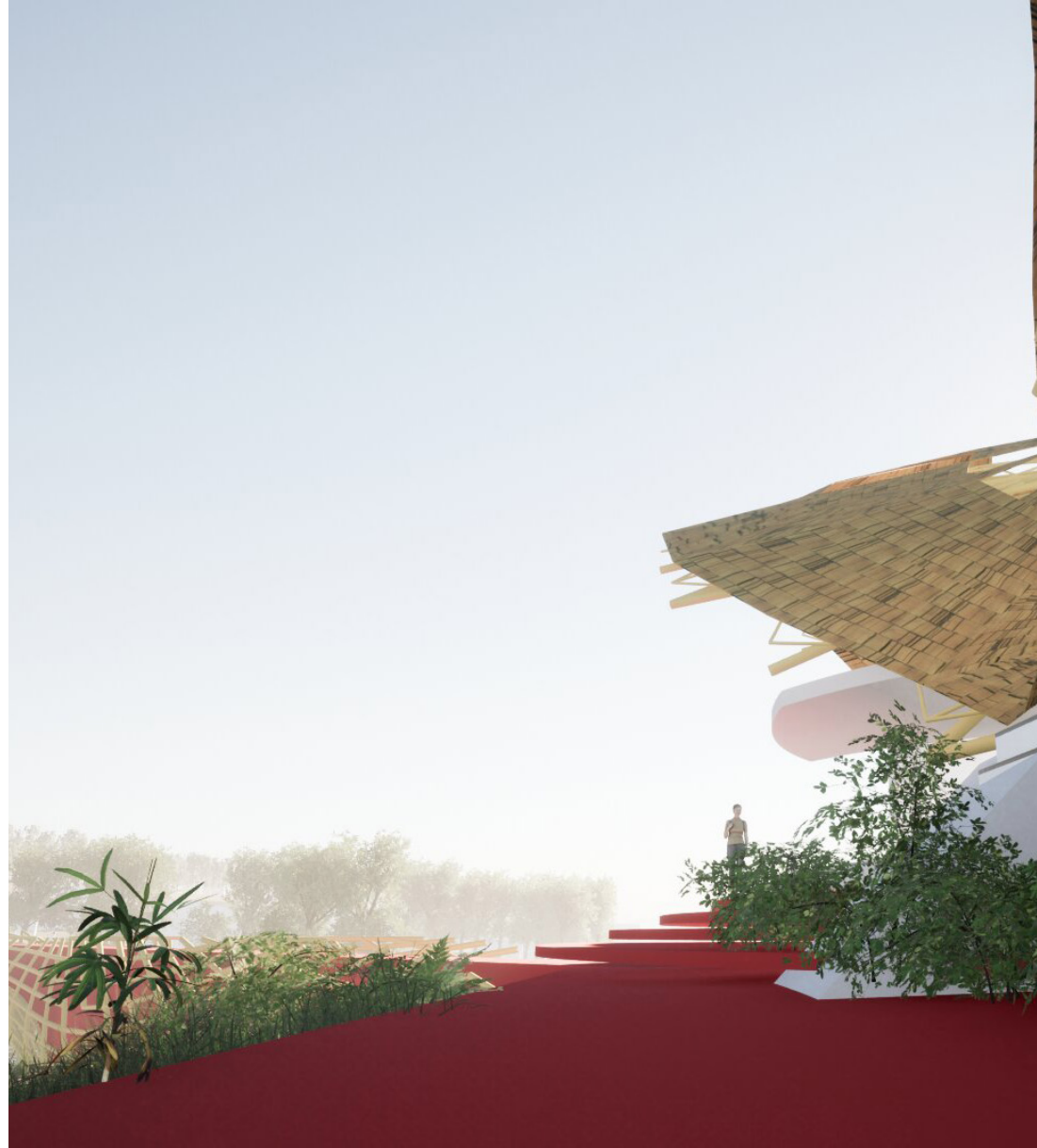
-ADMIN

-Seamlessly layering the transition between public and private zones
-the skylights and how naturally illuminate the interior space



FRONT ELEVATION

- Depicts how well the building is nestled within the environment
- depicts the wavy, organic nature of the roof profile that mimics the texture of the topography and ripples of the river water .v





WESTERN ELEVATION
- tries to show the character
of the land/topo that sits
between the building and
the river

