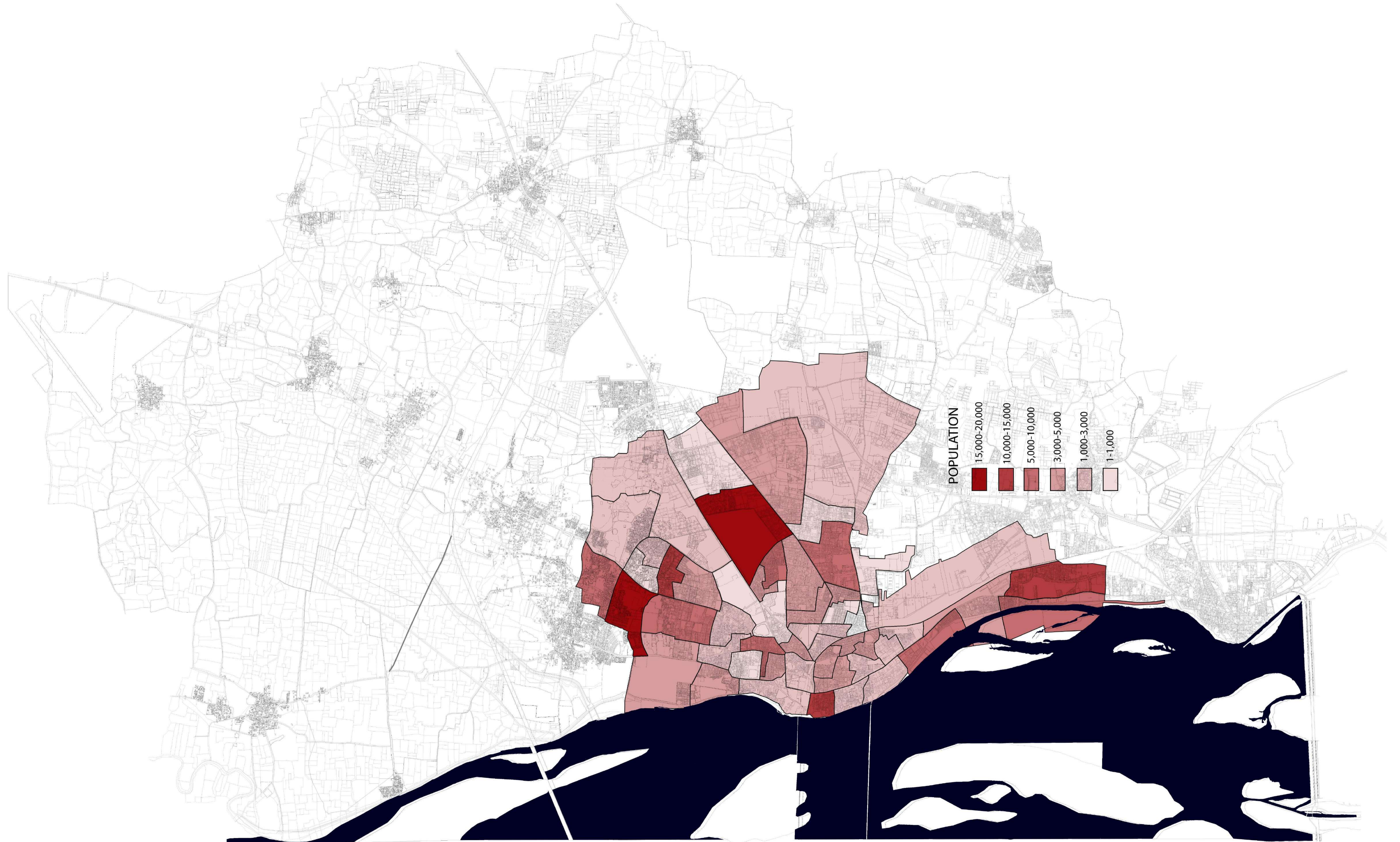


# POPULATION MAP



# LAND USE MAP

- RESIDENTIAL
- AGRICULTURE
- GREEN SPACES
- COMMERCIAL
- ROADS
- GOVERNMENT BUILDINGS
- SCHOOLS
- HOSPITALS
- RELIGION WORSHIP PLACES



# GREEN SPACES



- RESIDUAL SPACES
- GREEN SPACES
- GREEN SPACES

# SOIL MAP

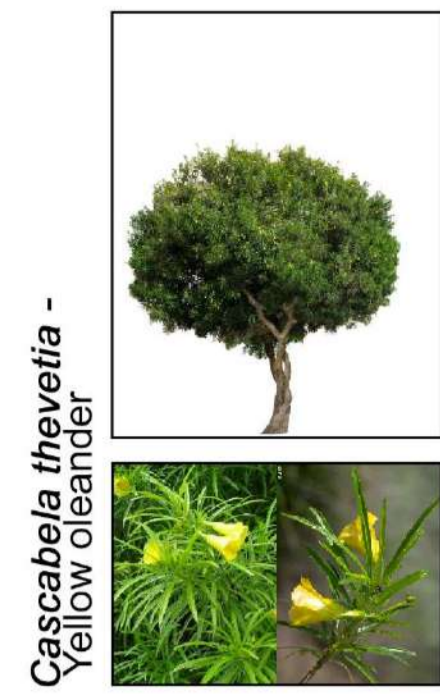


RESIDUAL SPACES

GREEN SPACES

# SHRUBS PALATE

## BUSHES



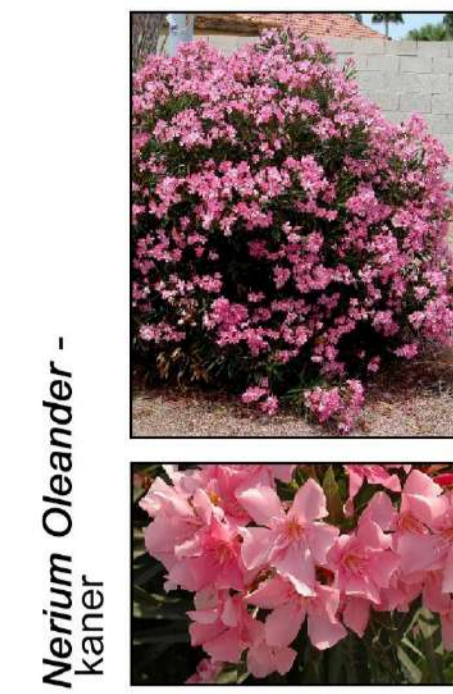
[Lifespan: 25-50 years]  
**Name:** Yellow oleander  
**Botanical name:** *Cascabela thevetia*  
**Tree growth:** evergreen tropical shrub or small tree grows upto 2-2.5 meters. Flowers bloom from summer to fall.  
**Specification:** The plant's toxins have tested in experiments for uses in biological pest control. Seed oil was used to make a 'paint' with antifungal, antibacterial and anti-termite properties.



[Lifespan: 15-20 years]  
**Name:** Adenium  
**Botanical name:** *Adenium obesum*  
**Tree growth:** Perennial Slow growing. Red, pink, white or combination flowers almost year round.  
**Specification:** The plant is harvested from the wild for local use, mainly as a medicine. A very popular ornamental plant.



[Lifespan: 15 years]  
**Name:** Ficus Fig  
**Botanical name:** *Ficus starlight*  
**Tree growth:** large evergreen shrub 1.5-2.5 metres. Time to ultimate height 10-20 years  
**Specification:** Its highly used as an ornamental treer shrub which is very easy to maintain and grow.



[Lifespan: 25-50 years]  
**Name:** Kaner  
**Botanical name:** *Nerium Oleander*  
**Tree growth:** Evergreen shrub that grows upto the height of 4 m and bearing leaves all the year around.  
**Specification:** It is commonly cultivated for its sweet smelling flowers which have medicinal uses.



[Lifespan: +50 years]  
**Name:** Hydrangea  
**Botanical name:** *Hydrangea macrophylla*  
**Tree growth:** reaches upto 2 meters height and blooms during Summer-fall.  
**Specification:** Colors also beguile with clear blues, vibrant pinks, frosty whites, lavender, and rose sometimes all blooming on the same plant.



[Lifespan: upto 80 years]  
**Name:** Century plant  
**Botanical name:** *Agave americana*  
**Tree growth:** lives only 10 to 30 years, spread around 6-10 ft with gray-green leaves of 3-5 ft long.  
**Specification:** Used as an herbal remedy for weak digestion, intestinal gas and constipation. The juice has antibacterial properties.



[Lifespan: +5 years]  
**Name:** Venus hair fern  
**Botanical name:** *Adiantum capillus-veneris*  
**Tree growth:** Evergreen slow growing plant. Grows from 6 to 12 inches  
**Specification:** medicinally take it internally to treat mental illness. Infusion used for jaundice therapy, yumbelbe and centpede stings.

## CREEPERS



[Lifespan: 6+ years]  
**Name:** Indian Traveller's Joy  
**Botanical name:** *Clematis Gouriana*  
**Tree growth:** A large climbing shrub, reaching up to the canopies of trees. Flowering takes place from August to February, while fruits appear from September to May  
**Specification:** Recognised as a medicinal herb in traditional medicine amongst tribal community.



[Lifespan: 40+ years]  
**Name:** Gardenia  
**Botanical name:** *Gardenia Lucida*  
**Tree growth:** They are evergreen shrubs and small trees, 5-50 cm.  
**Specification:** Flowering is from about mid-spring to mid-summer, and many species are strongly scented.



[Lifespan: >20 years]  
**Name:** Rangoon creeper  
**Botanical name:** *Combretum Indicum*  
**Tree growth:** Evergreen fast-growing shrub, can reach from 2.5 meters to up to 8 meters.  
**Specification:** The plant is used as an herbal medicine. Decoctions of the root, seed or fruit can be used as antihelmintic.



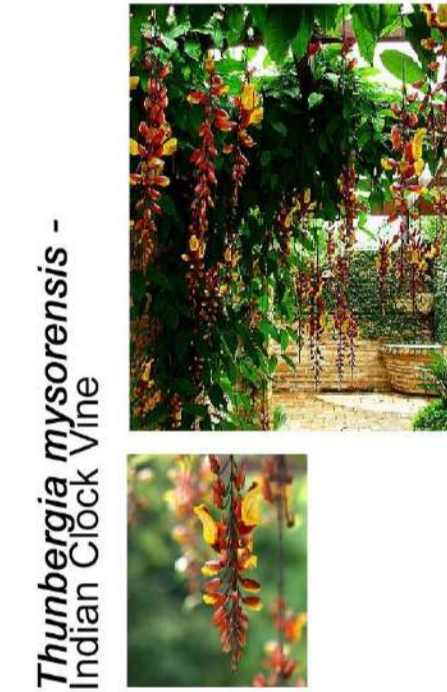
[Lifespan: >25 years]  
**Name:** Mexican creeper  
**Botanical name:** *Antigonon leptopus*  
**Tree growth:** fast-growing climbing vine that holds on via tendrils and is able to reach 25 ft or more in length.  
**Specification:** Producing pink or white flowers from spring to autumn. The fruit and seeds are eaten and spread by a wide range of animals such as pigs, raccoons and birds.



[Lifespan: 15-20 years]  
**Name:** Jasmine  
**Botanical name:** *Jasminum*  
**Tree growth:** Jasmine can be either deciduous (leaves falling in autumn) or evergreen (green all year round), and can be erect, spreading, or climbing shrubs and vines.  
**Specification:** Jasmine is a plant. The flower is used to make medicine as well for liver disease (hepatitis), liver pain due to cirrhosis, and abdominal pain due to severe diarrhea (dysentery). It is also used to cause relaxation (as a sedative), cancer treatment.



[Lifespan: <60 years]  
**Name:** Pride of India  
**Botanical name:** *Lagerstromia speciosa*  
**Tree growth:** Deciduous small to medium sized tree can grow upto 20 meters. The flowers in this plant bloom only once in a year at the peak of summer.  
**Specification:** Plant's young leaves are consumed as vegetables, and its old leaves and mature fruit are used in traditional medicine for reducing glucose in blood.



[Lifespan: 12-15 years]  
**Name:** Indian clock vine  
**Botanical name:** *Thunbergia mysorensis*  
**Tree growth:** reaches upto 6 meters. A woody-stemmed evergreen vine.  
**Specification:** The vine blooms from spring to autumn. Its sweet nectar is attractive to sunbirds, a very small passer-



[Lifespan: 80-100 years]  
**Name:** Hydrangea  
**Botanical name:** *Adenocalymma Comosum*  
**Tree growth:** slow growing evergreen climber, height upto 60 cm.  
**Specification:** A large, golden-flowered, with only one or two flowers open at a given time, indicates continuous flowering over at least several weeks. It is considered analgesic, anti-inflammatory, anti-rheumatic and anti-pyretic, and also effective as a mosquito and snakes repellent.



[Lifespan: 8+ years]  
**Name:** Bleeding-heart vine  
**Botanical name:** *Clerodendrum Thomsoniae*  
**Tree growth:** evergreen growing to 4 m  
**Specification:** grown as an ornamental plant for its decorative two-coloured flowers.

## GROUND COVERS AND GRASSES -



[Lifespan: 2-3 years]  
**Name:** Poinsettia  
**Botanical name:** *Euphorbia pulcherrima*  
**Tree growth:** shrub - height of 0.6-4 metres.  
**Seasonality:** evergreen  
**Specification:** Cant with stand extreme cold weather. And leaves are poisonous.



[Lifespan: 5-15 years]  
**Name:** Dwarf lilyturf  
**Botanical name:** *Ophiopogon Japonicus*  
**Tree growth:** Perennial. It is an evergreen, sod-forming perennial plant, 8-12" tall.  
**Specification:** It is grown as an ornamental plant, providing an excellent groundcover. really thrives in a slightly moist, light shade setting. traditionally used as a Chinese medicine.



[Lifespan: >25 years]  
**Name:** Lemongrass  
**Botanical name:** *Cymbopogon*  
**Tree growth:** grow to about 2 m. Lemongrass grows quickly and spreads to fill a planting bed or pot.  
**Specification:** cultivated as culinary and medicinal herbs because of their scent, resembling that of lemons. used as insect repellent (especially mosquitoes) in insect sprays, aromatherapy, culinary purposes, as a flavoring.



[Lifespan: 10-20 years]  
**Name:** Spider Grass  
**Botanical name:** *Liriope spicata*  
**Tree growth:** Perennial evergreen foliage 6-12" high. Fast growing.  
**Specification:** Spikes of tiny violet-blue flowers appear in late summer. Liriope is a genus of low, grass-like, flowering plants from asia.



[Lifespan: 10-15 years]  
**Name:** Pampas Grass  
**Botanical name:** *Cortaderia selloana*  
**Tree growth:** fast growing grass. Reaches height of 3 m. The leaves are long and slender, 1-2 m.  
**Specification:** Pampas grass is highly adaptable and can grow in a wide range of environments and climates.



[Lifespan: 6-15 years]  
**Name:** Fountain Grass  
**Botanical name:** *Pennisetum alopecuroides*  
**Tree growth:** Perennial. Spreading clumps from 2-3' tall.  
**Specification:** Drought, Erosion, Wet Soil, Black Walnut, Air Pollution tolerant. Spreading clumps from 2-3' tall and as wide. medium to deep green leaves (to 1/2" wide) in summer, changing to golden yellow in fall and fading to beige in late fall.



[Lifespan: >25 years]  
**Name:** Buddha Bamboo  
**Botanical name:** *Bambusa ventricosa*  
**Tree growth:** 6-10 m tall. Very fast growing  
**Specification:** Under harsh conditions, this bamboo develops short swollen internodes - hence its name 'Buddha's Belly'. shade setting. Great for privacy screening on acreage, windbreaks or erosion control.



[Lifespan: 100+ years]  
**Name:** Black bamboo  
**Botanical name:** *Phyllostachys nigra*  
**Tree growth:** Growing up to 5 m (16 ft) tall by 3 m (10 ft) broad forms clumps of slender arching canes which turn black after two or three seasons.  
**Specification:** It is used for lumber (timber), food, and musical instruments, among other things.



[Lifespan: 25+ years]  
**Name:** Golden bamboo  
**Botanical name:** *Phyllostachys aurea*  
**Tree growth:** initially 1-3 feet once established usually grow 3-5 feet in height per year.  
**Specification:** It is well-suited to the making of bamboo pipes. Ornamental purposes and privacy hedges.

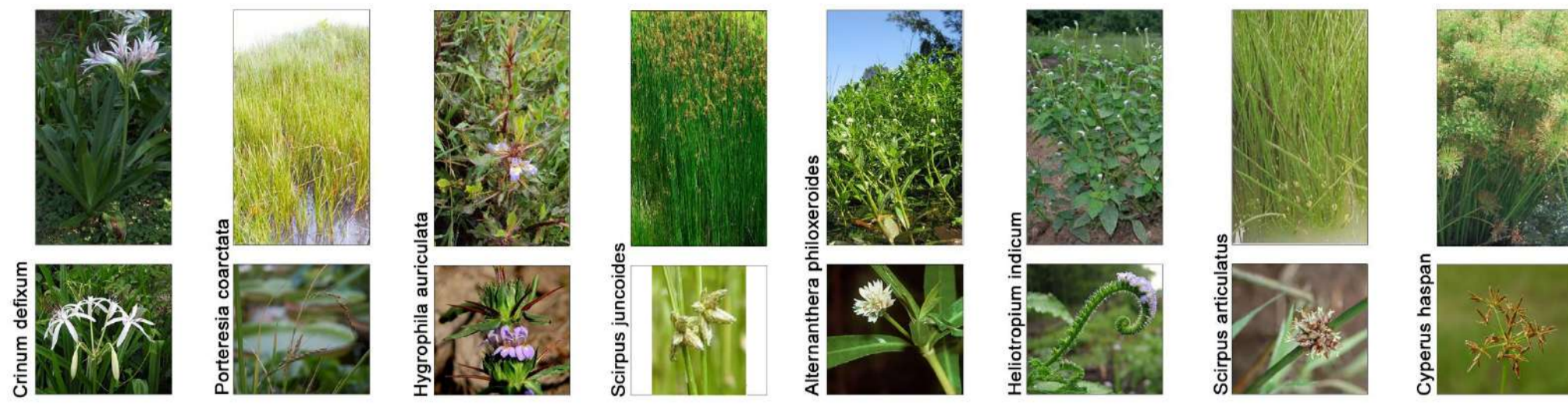


[Lifespan: 3-5 years]  
**Name:** Evercream  
**Botanical name:** *Carex oshimensis*  
**Tree growth:** moderate to slow growing, grows upto a feet tall and 2 feet wide.  
**Specification:** best used to create a river of color in the shade garden. Carex 'Evercream' is drought tolerant, but really thrives in a slightly moist, light

# WETLAND PALATE

## EMERGENT PLANTS

**Emergent wetland plants** are rooted in soil with basal portions that typically grow beneath the surface of the water, but whose leaves, stems (photosynthetic parts), and reproductive organs are aerial.



- Cinnamomum**: > Height- 1-1.8 m > used in indigenous medicine for many diseases > Leaf extract is used as a treatment for body-ache, leprosy, fever and diarrhoea. > The bulbs are crushed and applied on to piles and itching.
- Portulaca caudata**: > Height - upto 1 m > Wild grass > Whole plant given as cattle food to increase lactation. > In Ayurveda, leaves and fruits used for pain, fevers, body aches.
- Hydrophila auriculata**: > Height -1.50 m > Roots, flower, stem, fruit, and leaves as ash burnt together are used as a medication.
- Scirpus lunceoides**: > Height -0.15-0.70 m > Sometimes used as a green-food for cattle; feeding-value rather high.
- Alternanthera philoxeroides**: > Height-0.60 m > Used medicinally. > Tertiary filtration system for domestic sewage. > Cultivated as a source of biomass for compost-making.
- Heliotropium indicum**: > Height - 1.00 m > The plant has been widely used to treat warts, inflammations and tumours. > The whole plant is buried and, after the fleshy tissue has rotted away, the fibre is used to make false hair for women.
- Scirpus articulatus**: > Height -0.20-0.50 m > Seeds of are eaten as granular sweets. > Whole plant given as cattle food to increase lactation. > In Ayurveda, leaves and fruits used for pain, fevers, body aches.
- Cyperus haspan**: > Height - 0.50 m > Smoke from the pith of the plant is used as a febrifuge. > The pith of the stems has been used as lamp wicks. > The plant is a source of materials for weaving into mats and baskets.

## SUBMERGED PLANTS

**Submerged wetland plants** spend their entire life cycle beneath the surface of the water. Nearly all are rooted in the substrate. Submerged plants take up dissolved oxygen and carbon dioxide from the water column.



- Limnophila sessiliflora**: > Height - 0.40 m > Commonly used as a bunch plant in aquariums.
- Eelgrass (Eelgrass)**: > Height - 1.5 m > Used in aquariums.
- Hydrilla verticillata**: > Height - Is variable in height depending primarily on the depth of the water. > Its fluffy, filamentous, bright-green green leaves provide an excellent spawning habitat for fishes. > It is frequently used as a model organism for studies of plant physiology.
- Ceratophyllum demersum**: > Height - 1-3 m > Its fluffy, filamentous, bright-green green leaves provide an excellent spawning habitat for fishes. > It is frequently used as a model organism for studies of plant physiology.
- Myriophyllum aquaticum**: > Height - 2 m > Young shoot tips - cooked and used as a vegetable.
- Ottelia alismoides**: > Height - Is variable in height depending primarily on the depth of the water. > The petioles and tender leaves are eaten as a vegetable. > The plants are used to improve the water quality in ponds by capturing floating mud particles. > Used as medicinal treatment.

## FLOATING LEAVED PLANTS

**Floating Leaved plants** have leaves that float on the water's surface while the roots are anchored in the substrate. Stems connect the leaves, which are circular or oval and have a tough leathery texture, to the bottom.



- Nymphaea odorata**: > Height - Can grow in water up to 2.5 m deep. > All the parts of the plant are edible after cooked. > The roots of the plant has great medicinal values.
- Nymphaea peltata exotica**: > Height - Can grow in water 0.5-4.0 m deep. > Ornamental use. > edible and medicinal uses.
- Nelumbo nucifera**: > Height - Stem height 0.5-2m > The flowers, seed, leaves, and parts of the underground stem are used to make medicine. > Lotus flowers are used to stop bleeding.
- Ipomoea aquatica Forsk**: > Height - Stems are 2-3 metres or longer > Leaves and young shoots are edible raw or cooked.
- Apocynon natans**: > Height - Stems are 1.5m metres or longer > The soup prepared from the boiled tubers is use as traditional medicine.

## TREES

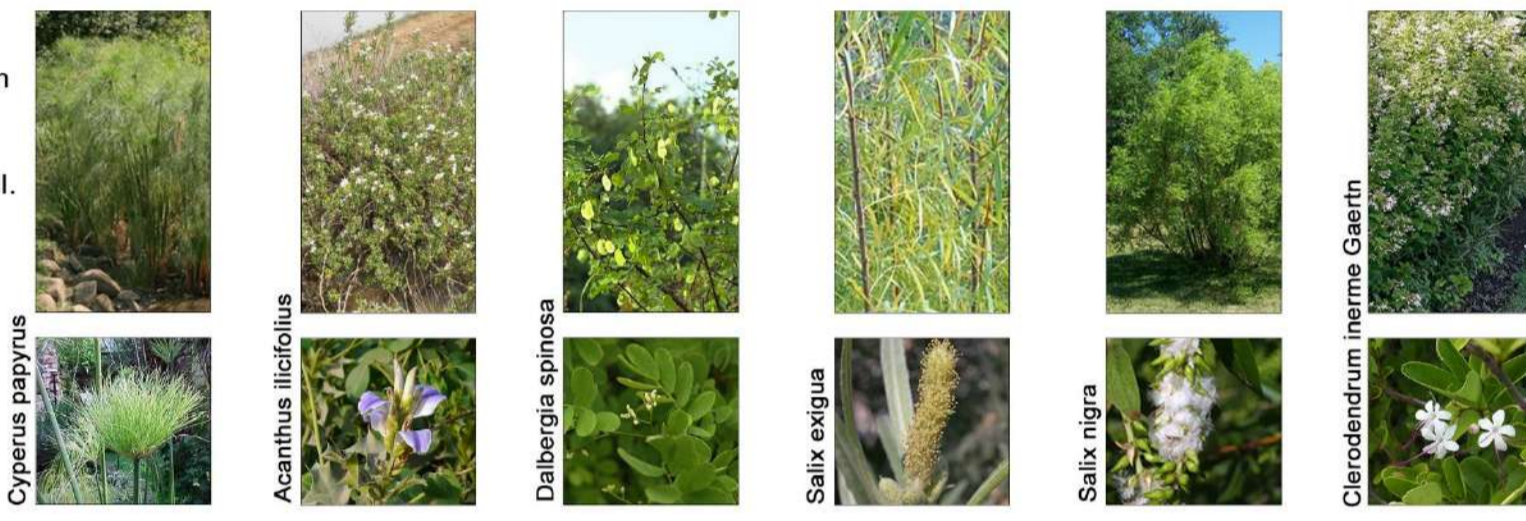
**Trees** are large woody plants greater than 7m tall.



- Sonneratia casearia**: > Height- 5-15m > The heavy wood is used for boatbuilding, construction, piles, and posts. > The pulp is suitable for kraft paper production. > Fruit is a folk remedy for sprains, swellings, and worms.
- Excoecaria agallocha**: > Height- 10 - 30 m > Certain parts of the wood are used for incense. > The white wood is soft and spongy. The roots are sometimes used as floats. > Different parts of the tree have various medicinal values.
- Ceriops decandra**: > Height- usually grows up to 15 metres. > The wood is used for fuel. > The branches are used for tool handles, and bent ones for boat ribs. > A decoction is used to treat haemorrhages.
- Avicennia marina**: > Height- 1 - 10 m > The resin from the bark is used to treat snake bites. > The tree is useful for preventing coastal erosion and as a windbreak. > The wood is also used as firewood and for charcoal production.
- Thespesia populneoides**: > Height- grow up to 20 m > The different parts of trees has various great medicinal values. > The tree is valuable as a coastal erosion and as a windbreak. > An oil is obtained from the seed which is used in lamps.
- Hibiscus liliaceus**: > Height- grow up to 15 m > The bark fibre is widely used for making cordage and fishing lines and nets. > Fibre is also used for textiles and the bark for making bark cloth. > Wood is suitable for the manufacture of plywood, hardboard and paper and is used as fuelwood.

## SHRUBS

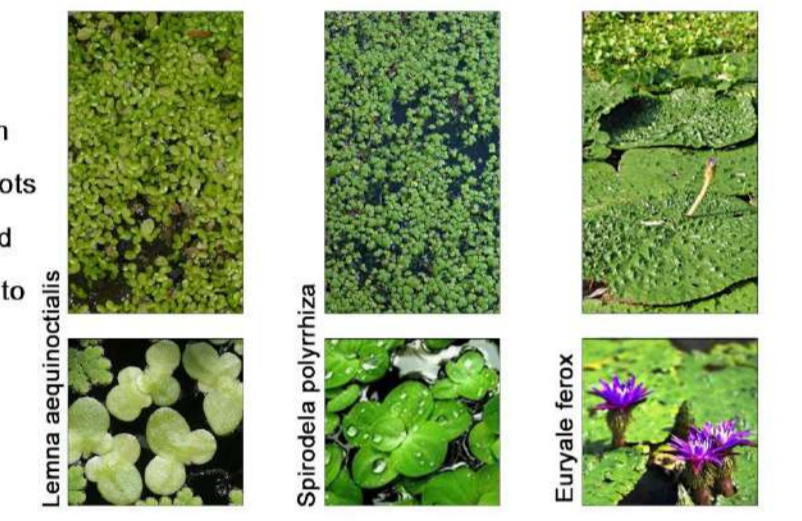
**Shrub plants** are rooted in the soil, but have a woody stem and grow upto 7m tall. Shrub plants may be true shrubs or small trees.



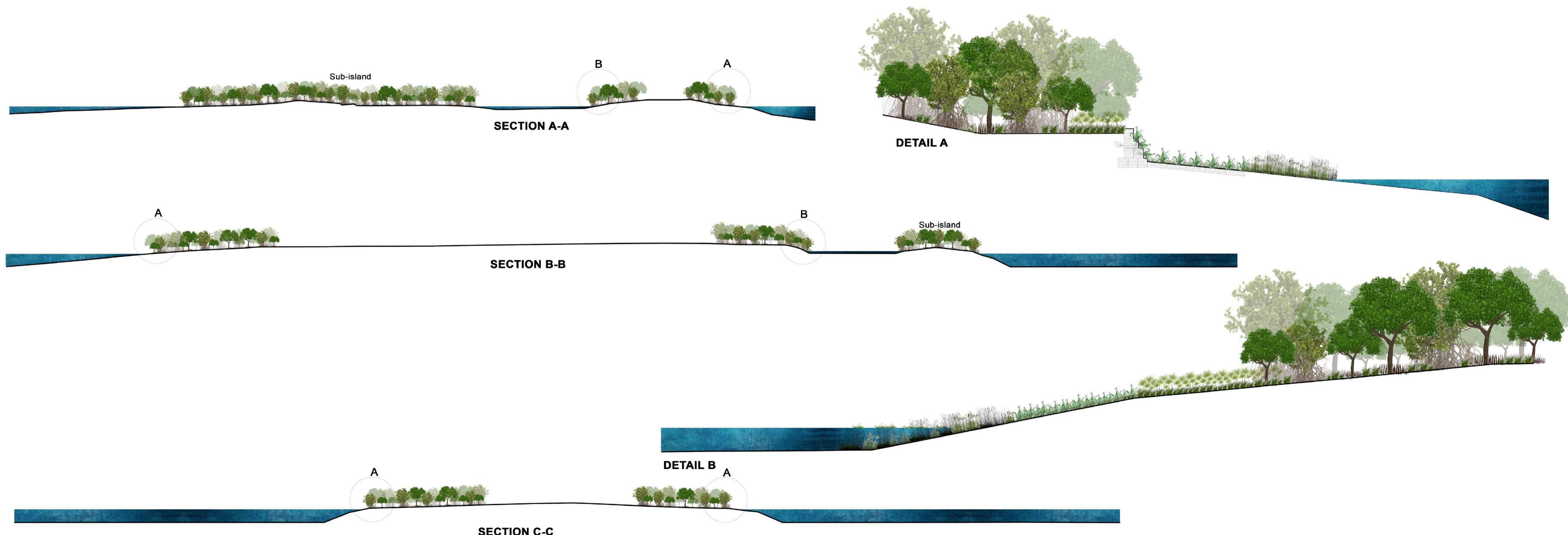
- Cyperus papyrus**: > Height- 4-5 m > the stems of this plant were used to make a paper. > Used for various purposes such as baskets, sandals, blankets, medicine, incense, and boats.
- Acanthus ilicifolius**: > Height- 0.5-2 m > The ashes of the burnt plant are used as a lye for making soap. > A decoction of the leaves and roots is used as a treatment for asthma.
- Dalbergia spinosa**: > Height- upto 8 m > Fuel wood, charcoal and timber are produced. > Wood is used for furniture and ornanace.
- Salix exigua**: > Height- upto 9 m > The leaves have been used to make a drink like orange juice. > The bark has been used in the treatment of sore throats, coughs and certain fevers. > The fibres in the bark have been woven to make clothing, bags and blankets. > Plants have an extensive root system used in soil stabilization projects.
- Salix nigra**: > Height- upto 12 m > Inner bark added to cereal flour for use in making bread. > The young stems are very flexible and are used in basket and furniture making. > A fibre obtained from the stems is used in making paper. > A good charcoal is also obtained from wood.
- Clerodendrum inermis Gaertn**: > Height- 1-4 m > Roots used for venereal diseases. > Leaves used for treating fever, cough, skin rashes and boils.

## FLOATING PLANTS

Leaves and stems of **floating plants** float on the water's surface. Roots may not be present and there is no connection to the bottom substrate.



- Lemna aquiculicollis**: > floating aquatic plant found in quiet waters
- Spirodela polyrrhiza**: > floating aquatic plant > The whole plant is used in the treatment of colds, measles and oedema. > Leaves are edible.
- Euryale ferax**: > floating aquatic plant > All the parts of the plant are edible. > seeds are taken internally in the treatment of chronic diarrhoea, kidney weakness.



TOURISTIC PLACES

📍 PAPI HILLS



📍 RESERVE FOREST OF INDIA

📍 KOVVUR



📍 PUSHKAR GHAT



📍 PICHUKA LANKA

📍 KADIUM NURSERY GARDEN

📍 DOWLAI SWARAM BARRAGE



📍 COTTON MUSEUM







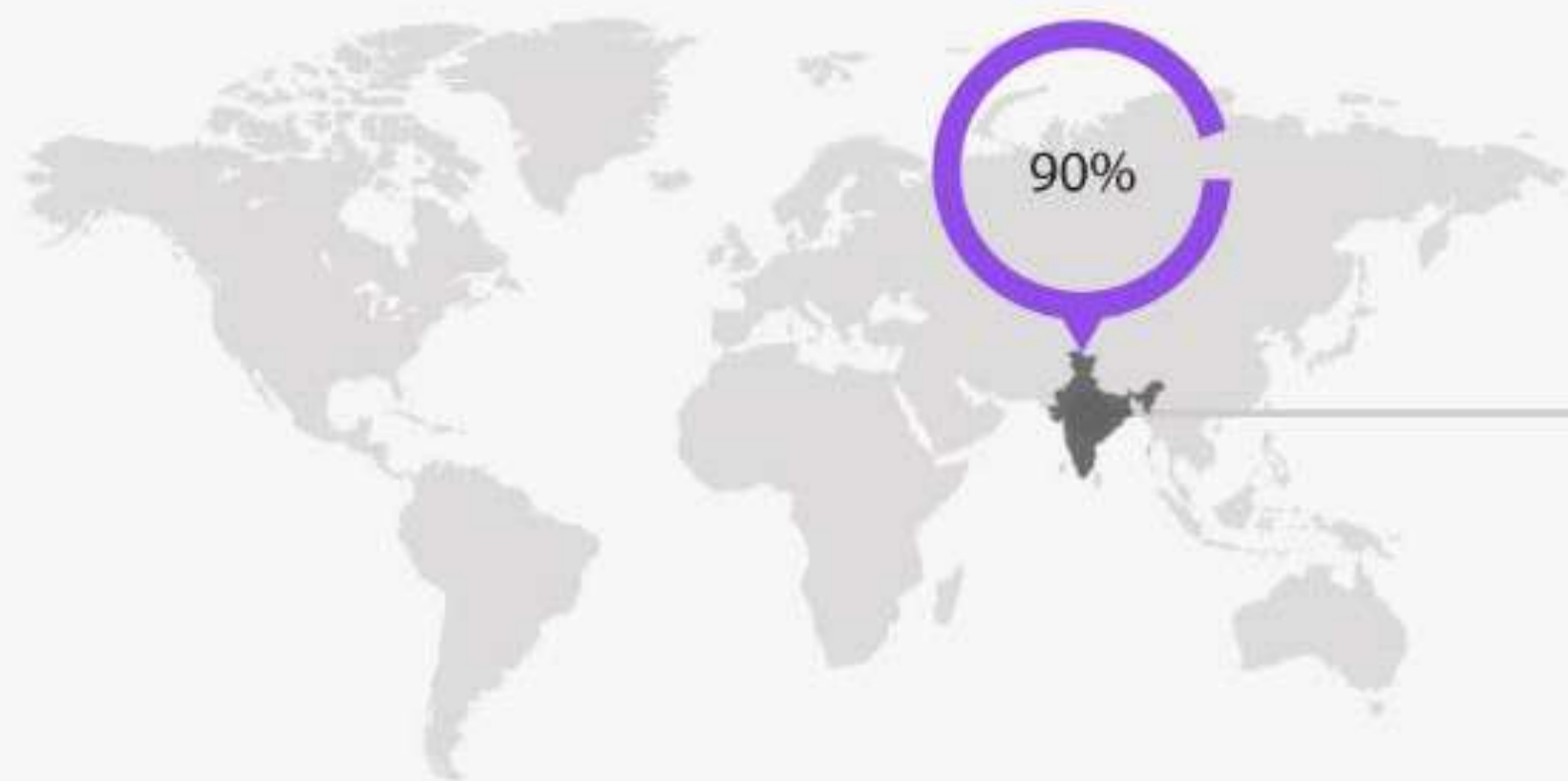
# RAJAMUNDRY, INDIA

The city is known for its historic traditional, cultural, agricultural and economic backgrounds and hence, it is known as the Cultural Capital of Andhra Pradesh.

One of the longest road cum rail bridges across Godavari River, connects the city with the town of Kovvur.

The Kotilingeswar Ghat temple on the banks of Godavari river is one of fifty five Shakti Peethas.

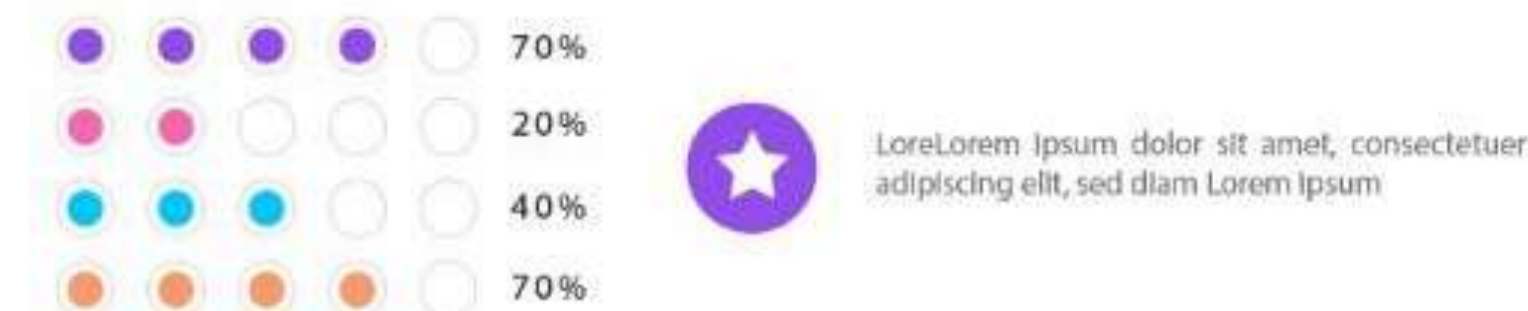
As of 2018 census, it is the fifth most populous city in the state, with a population of 540,825.



# SWOT ANALYSIS

## RAJAMUNDRY AND PEOPLE

Religious hotspot  
Recreational hotspot  
Cultural and traditional hotspot



### Strength

- Existing Ghats -near Rajahmundry city
- Active functional spaces -in and around river front in Rajahmundry
- The bridge -connection between Rajahmundry and Kovvuru
- Kadiyam nursery -availability of varied tree species.

- Pushkaralu- Key Pilgrim event happening every 12 years.
- Aboundand spaces -Availability of spaces in the city
- Pulsa -Well-known fish

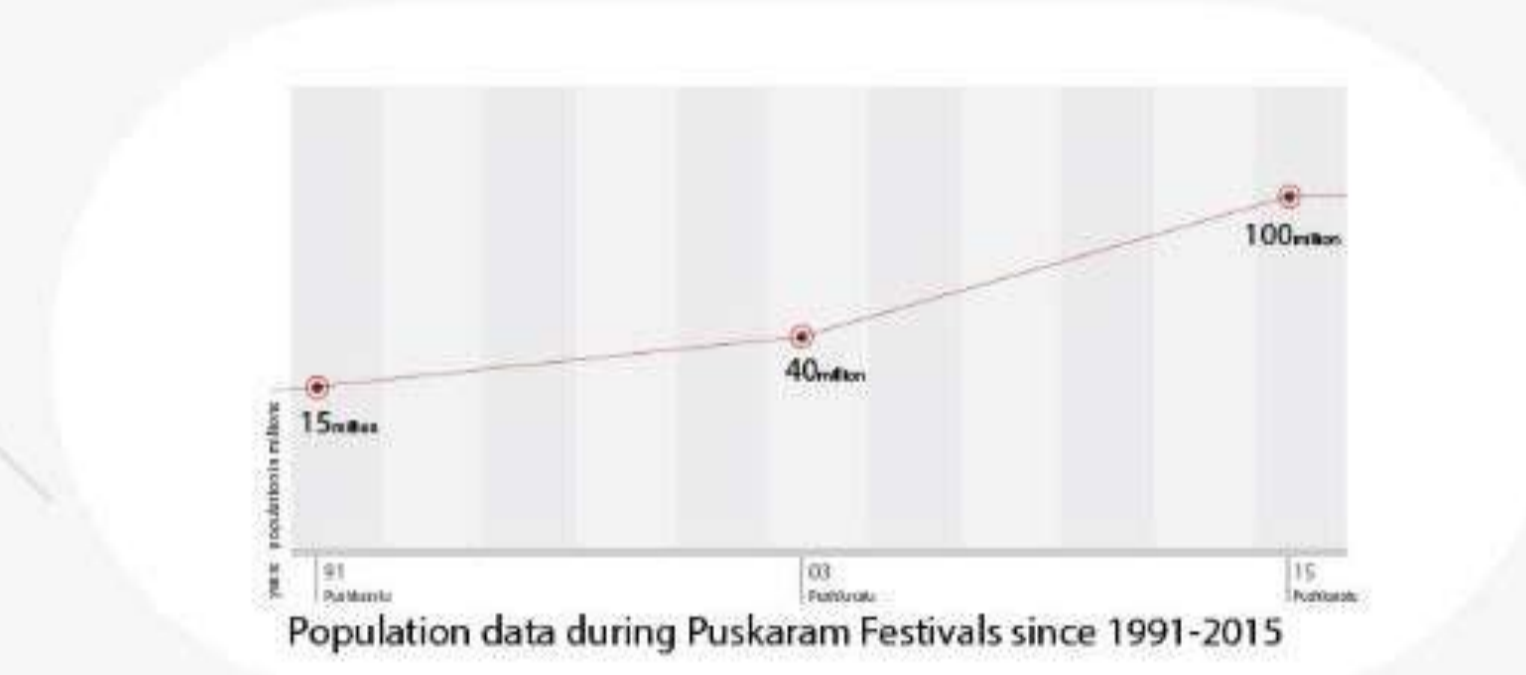
### Demographics of Rajmundry

The existing number of elderly and youndsters are distributed evenly along with the

### Weakness

- Lack of proper services (toilets, changing rooms, parking, etc.)
- Pushkaralu -ruins the serenity of the space and livelihood
- Bridge length -connecting Rajahmundry and Kovvuru.
- Accessibility -No handicap friendly zones

- Connectivity -between city & Ghats
- Lack of Green spaces
- Soil erosion of island and connectivity from land and island
- Street furniture -Lack of appropriate infrastructure



### Opportunity

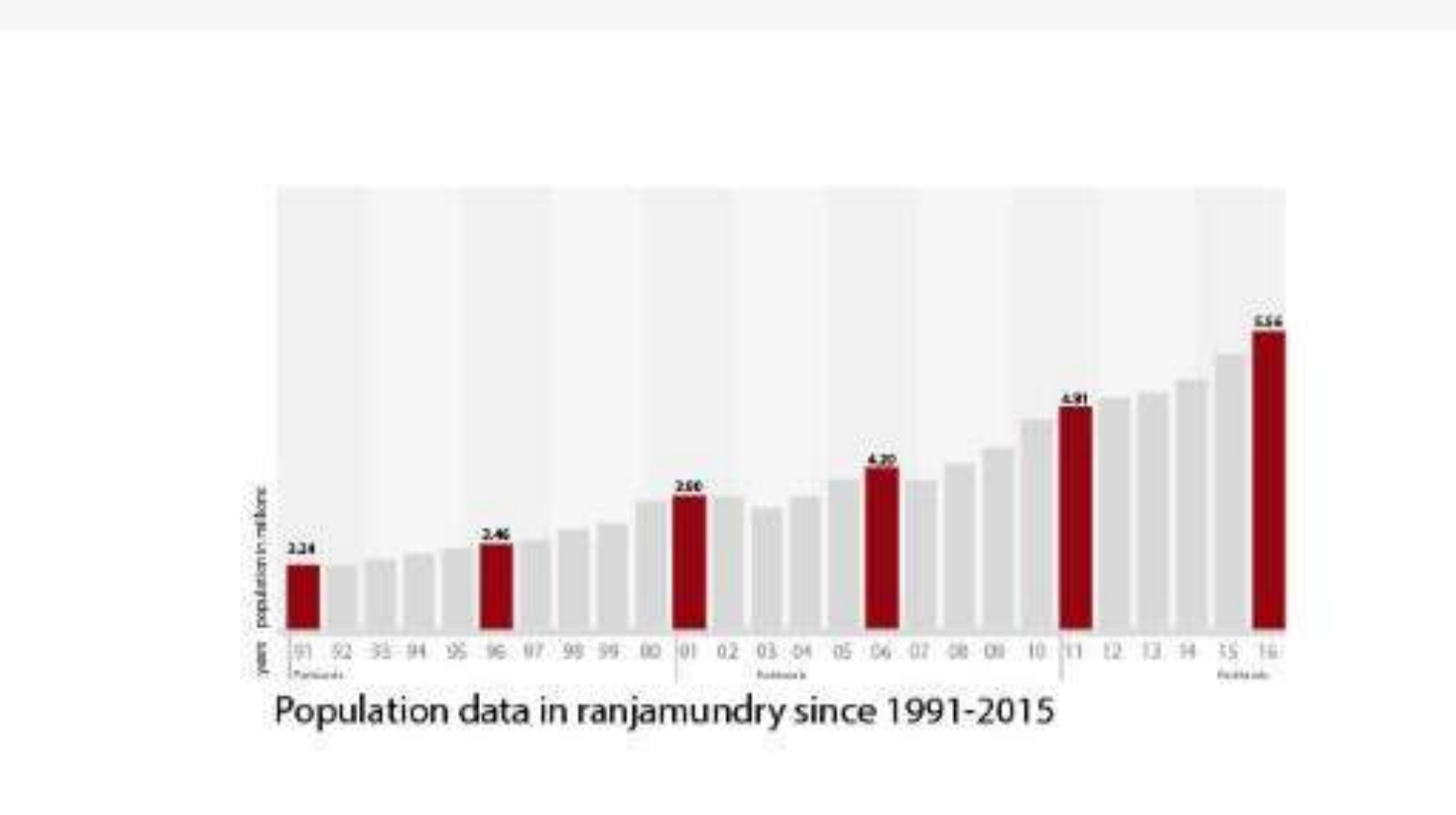
- Connecting riverfront and usergroup -Possibility to distribute the user group of Kovvuru Riverfront.
- Addition of functions -to the existing palette
- To boost development - of Kovvuru village.

- Structural stability -of existing bridge
- Kadiyam bridge-usability in design
- Pushkaralu-Employment increase ratio
- Island-usability -recreational-biodiversity
- Paper Industry -production of material

### Threats

- Figure ground ratio for Kovvuru.
- Literacy /institution
- Connectivity through bridge in a proper accessible way

- High flood Island can be submerged



the ratio of the people is directly proportional to time. Where the accessibility is increasing day by day and these places are becoming more and more flooded with people, in high amounts making it a touristic, pilgrimage attractions in area. and now seeking a major infrastructure requirement as well as the revenue.

TIMELINE FESTIVALS

January



Ganga Sagar Mela  
Vasant Panchami  
Makar Sankranti

March



Holi  
Hanuman Jayanti

May

July



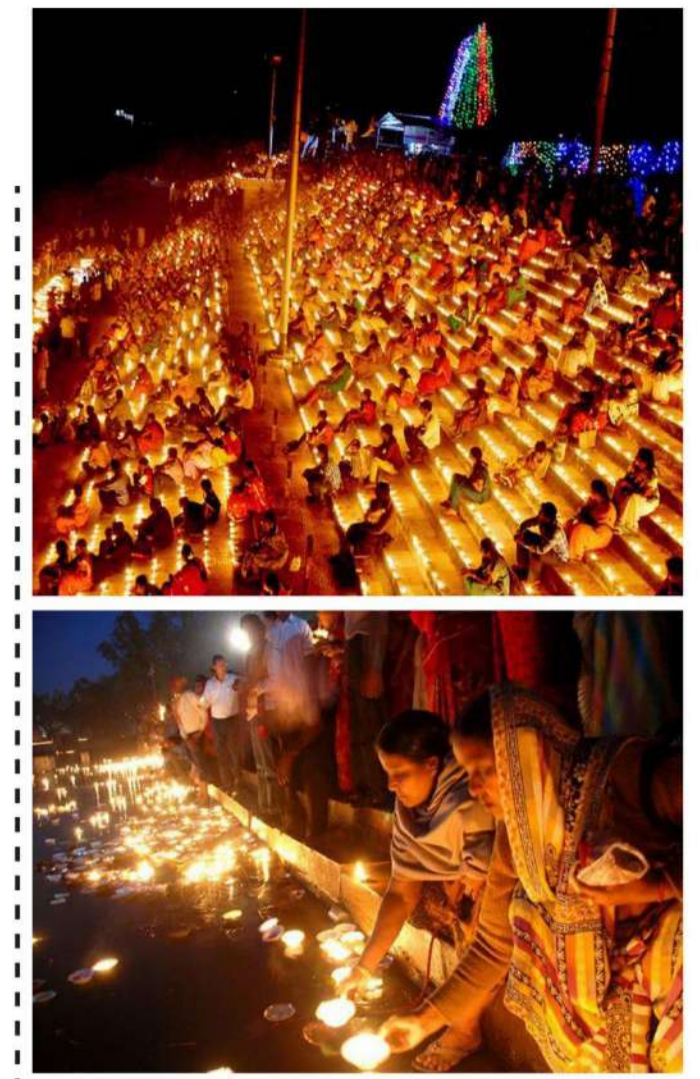
Ratha Yatra  
Guru Purnima

September



Anant Chaturdashi  
Nandotsav/  
krishnastami

November



Diwali  
Karthik Purnima

February



Shiv ratri

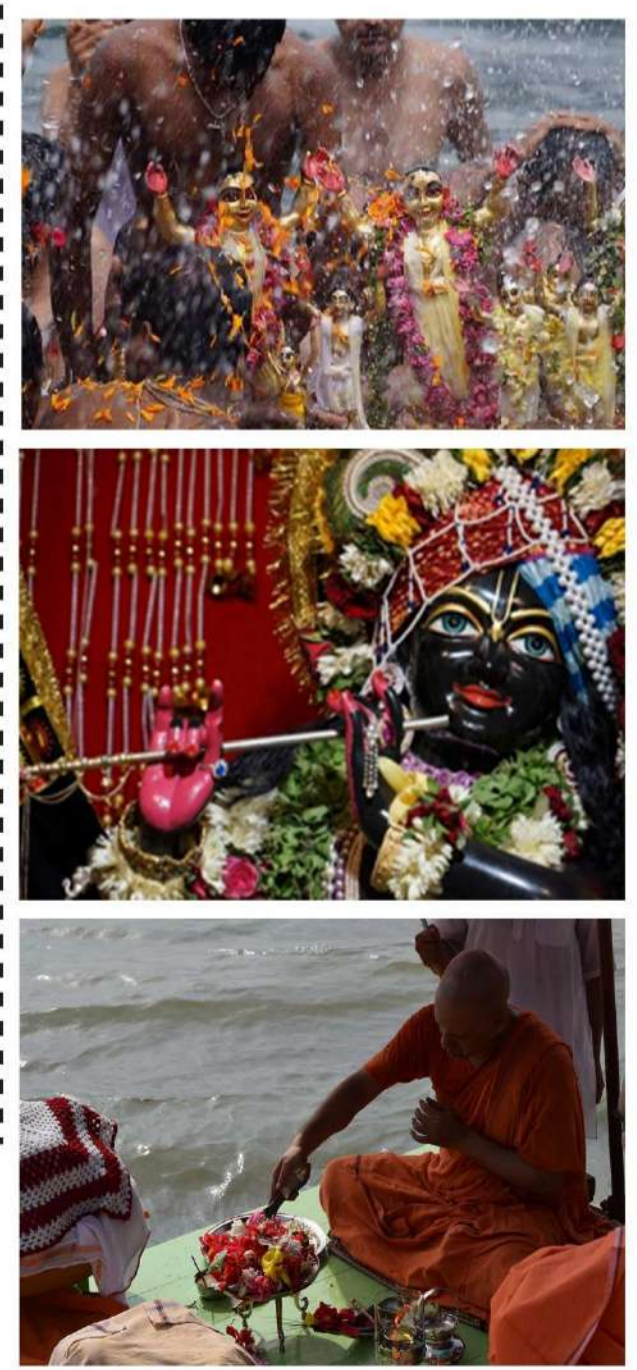
April



Ugadi  
Akshaya tritiya

June

Ganga Puja  
Nirjala Ekadashi  
Snana yatra



August

Sravna Purnima  
Chalukya feastival



October

Dasara  
Durga Puja



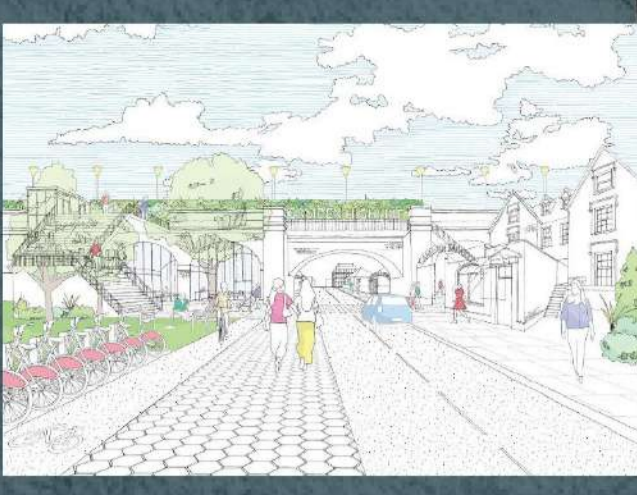
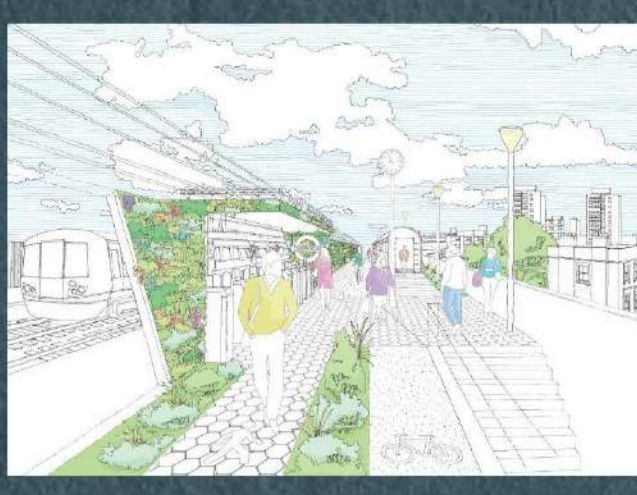
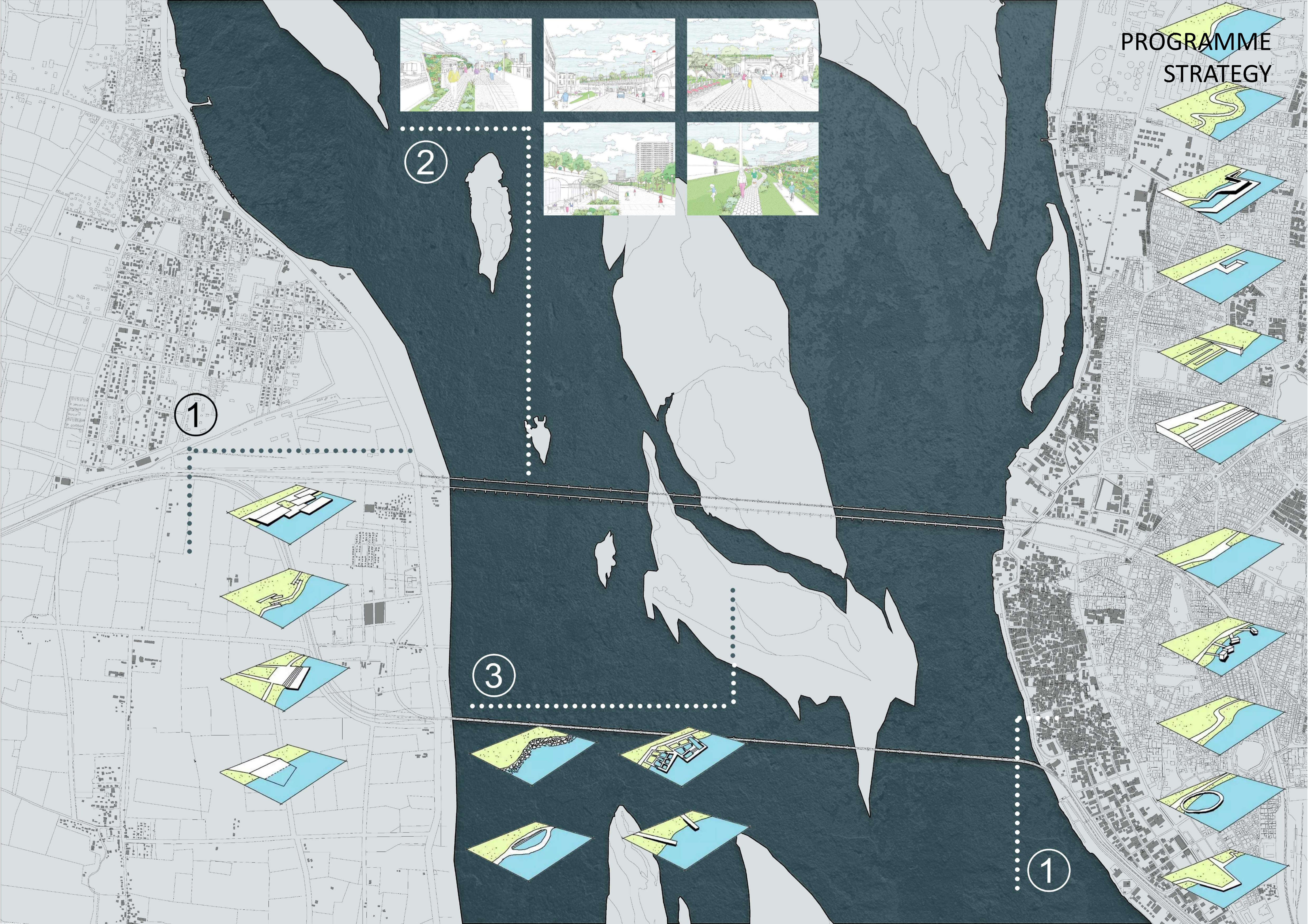
December

# PAPER PRODUCTION CYCLE



Trees will be grown and sent to paper production process as Rajahmundry have International paper factory. The by-product of the production process which is fly ash will be used as one of the construction material in the project, by making fly ash bricks. Also these bricks can be supplied accross India which will take a step to sustainability.

# PROGRAMME STRATEGY



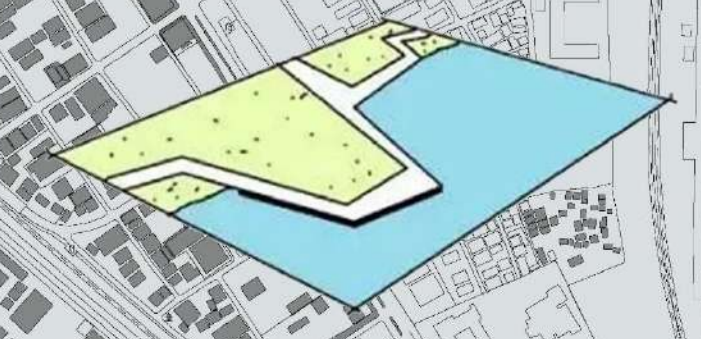
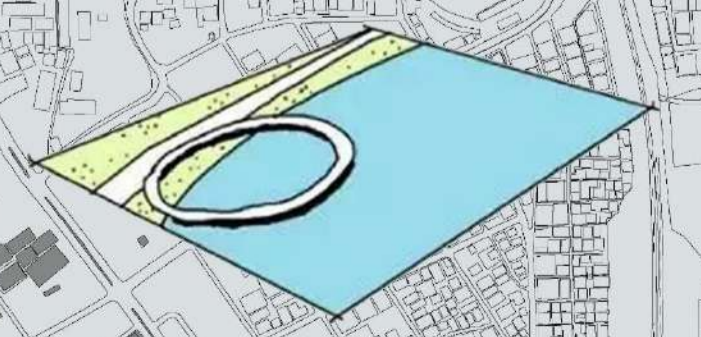
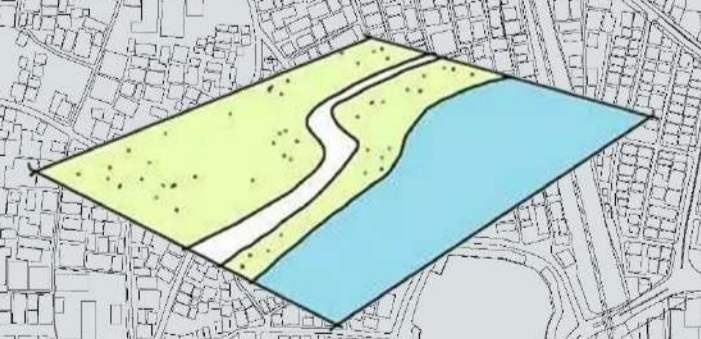
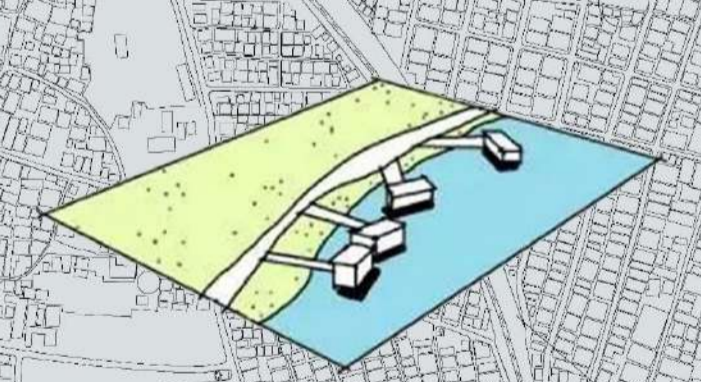
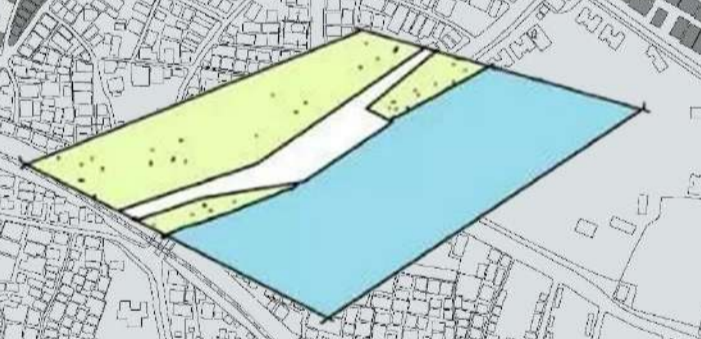
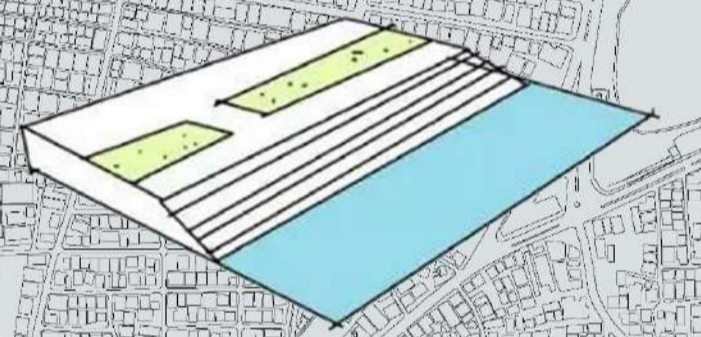
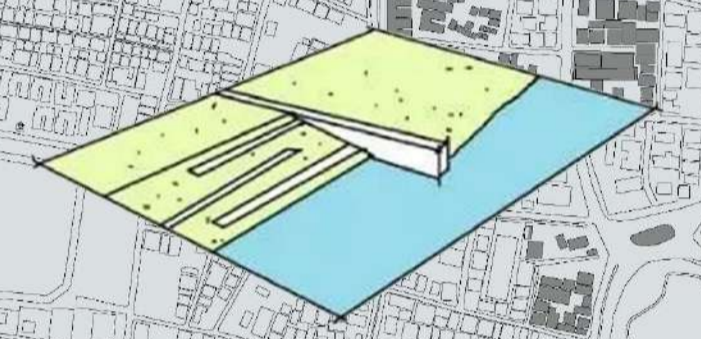
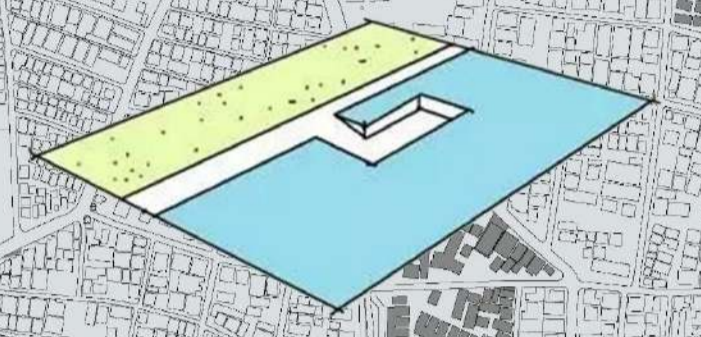
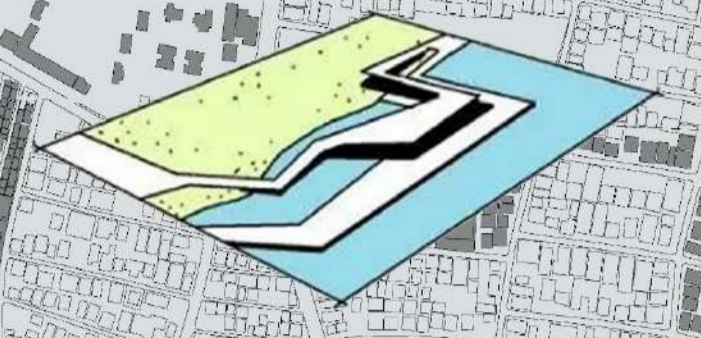
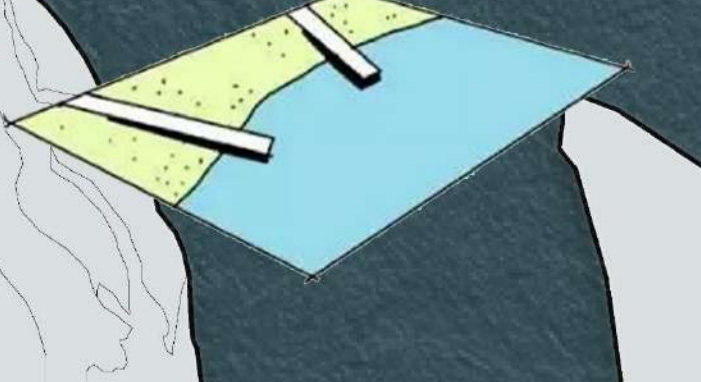
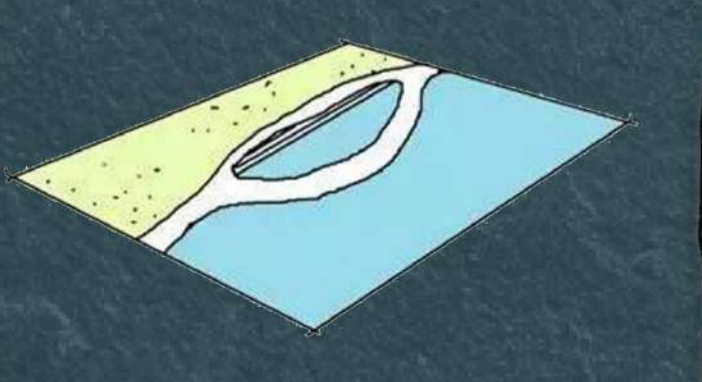
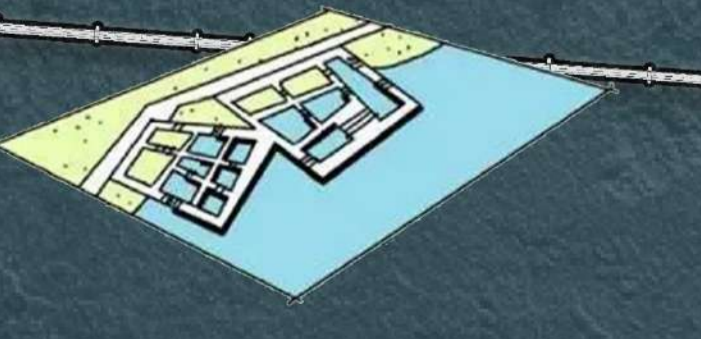
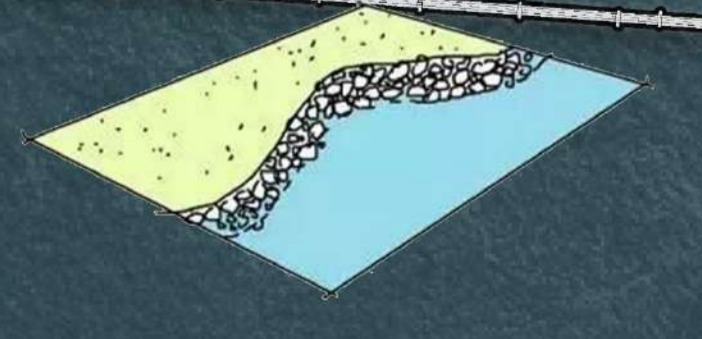
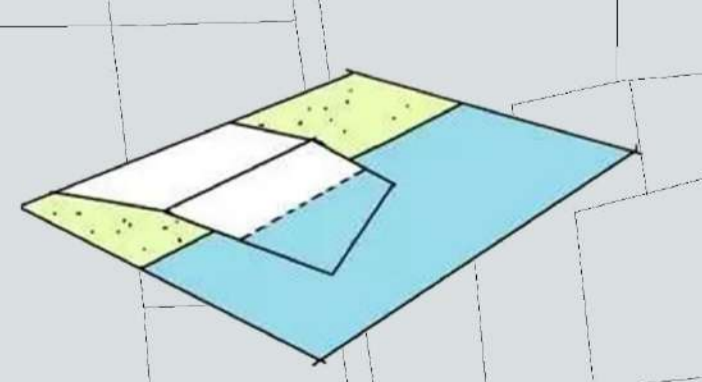
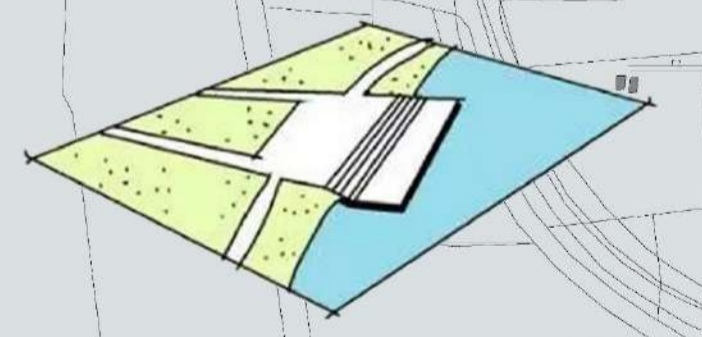
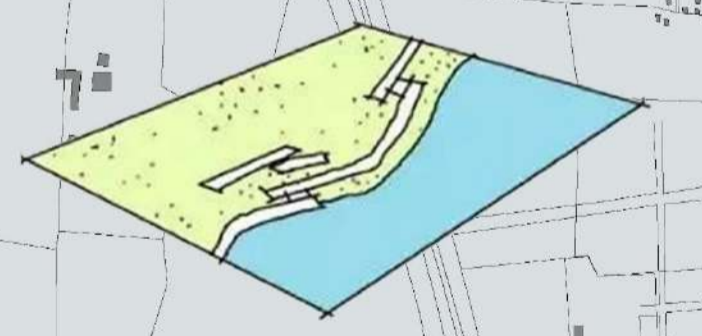
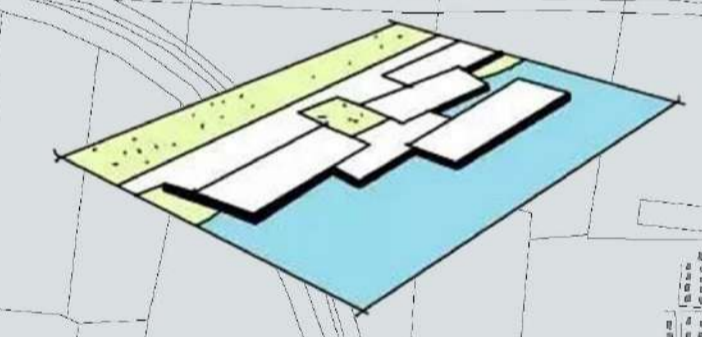
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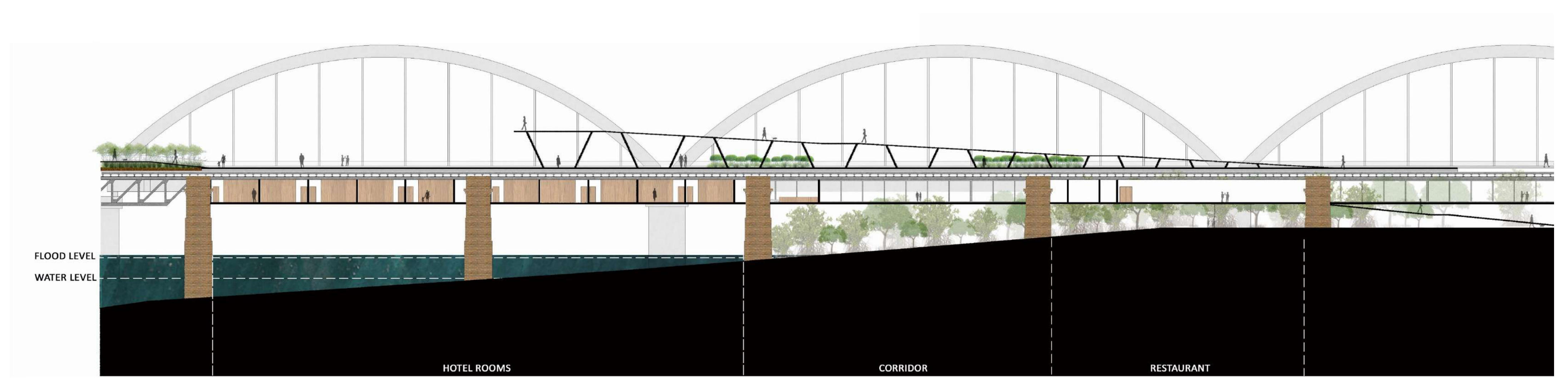
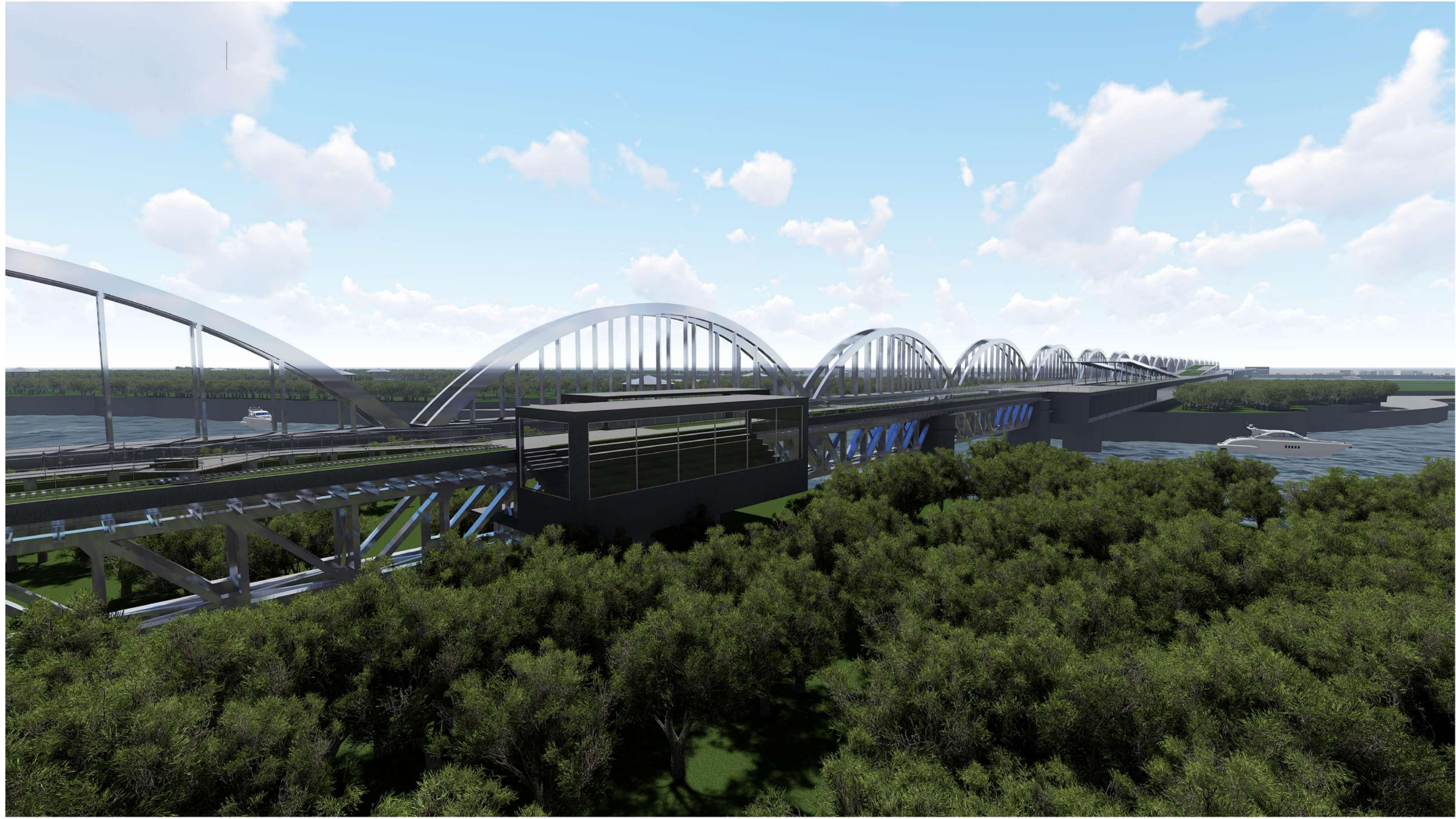
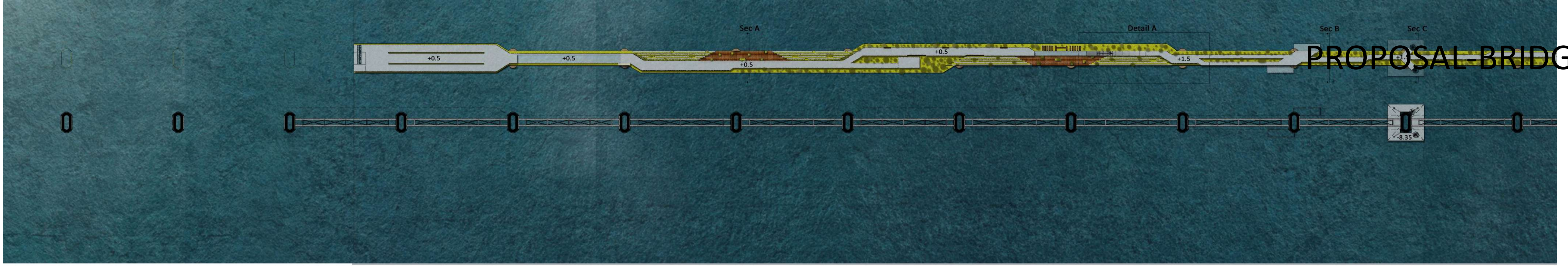
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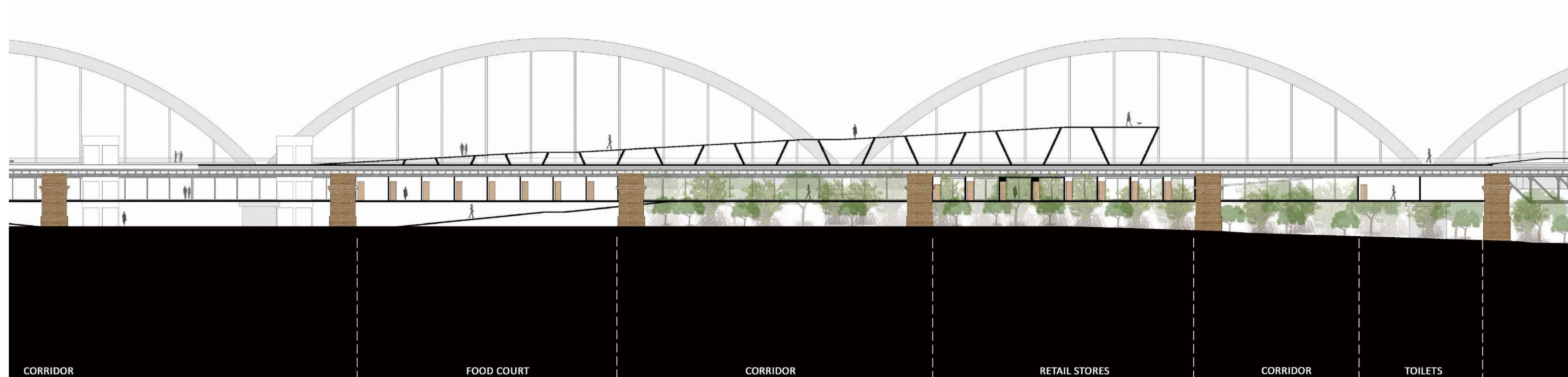
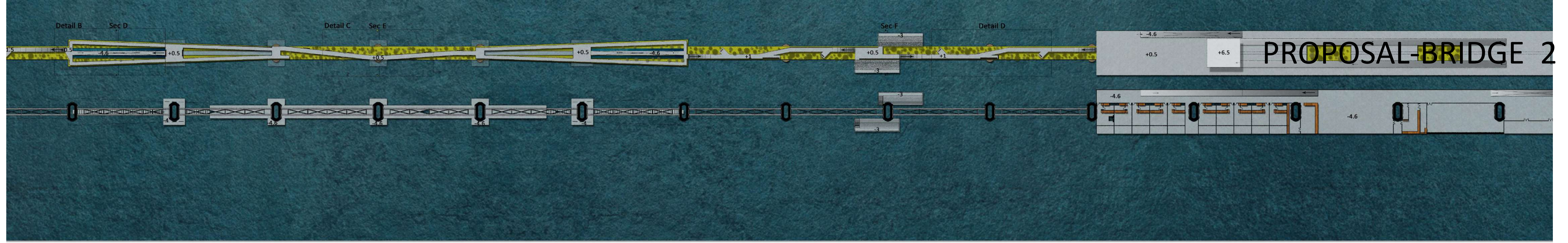




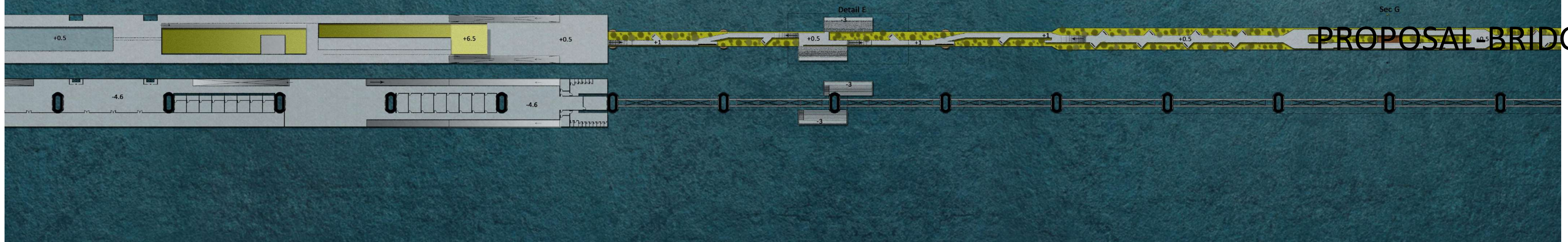


# PROPOSAL BRIDGE 1









SECTION A

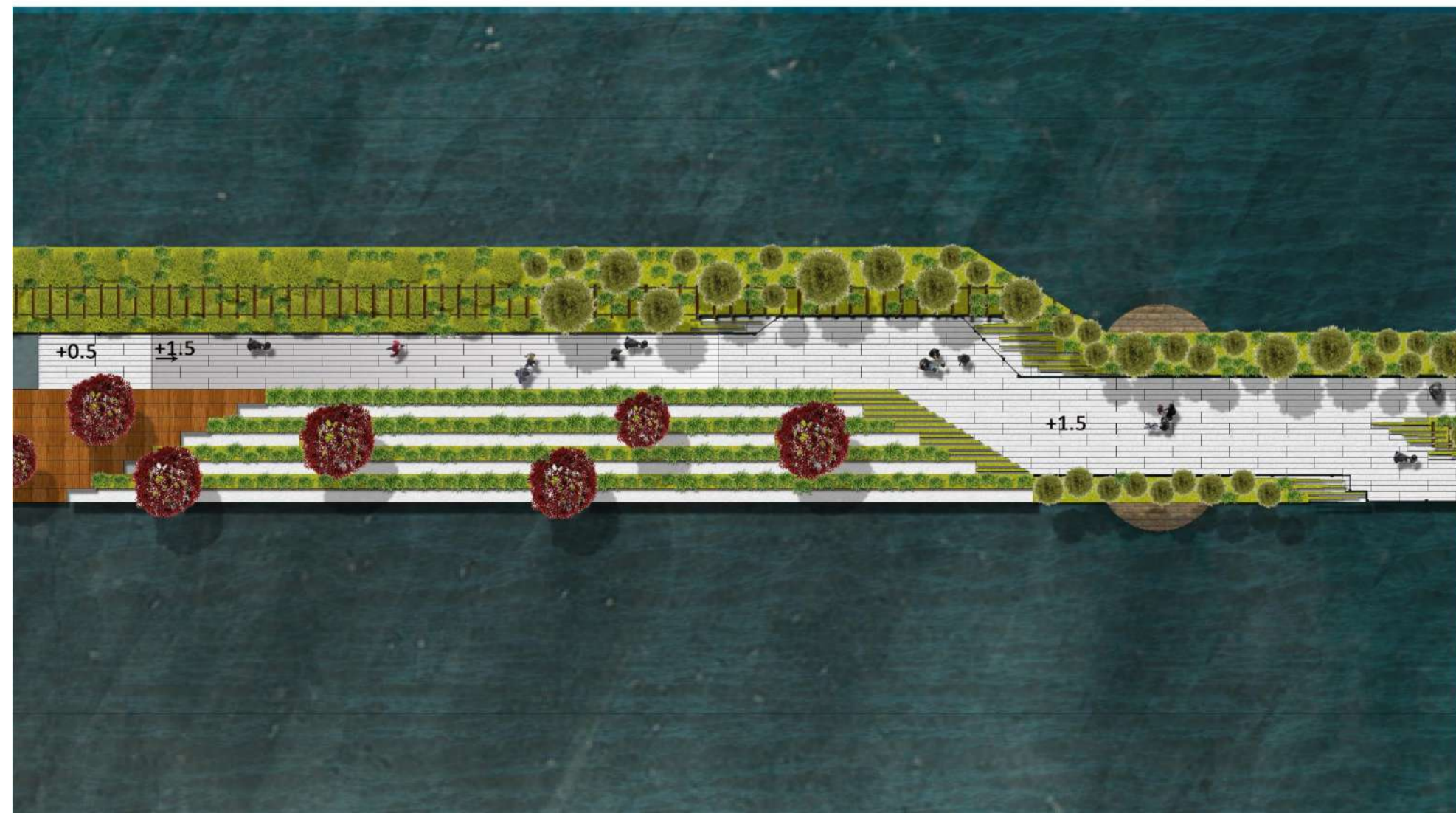
SECTION B

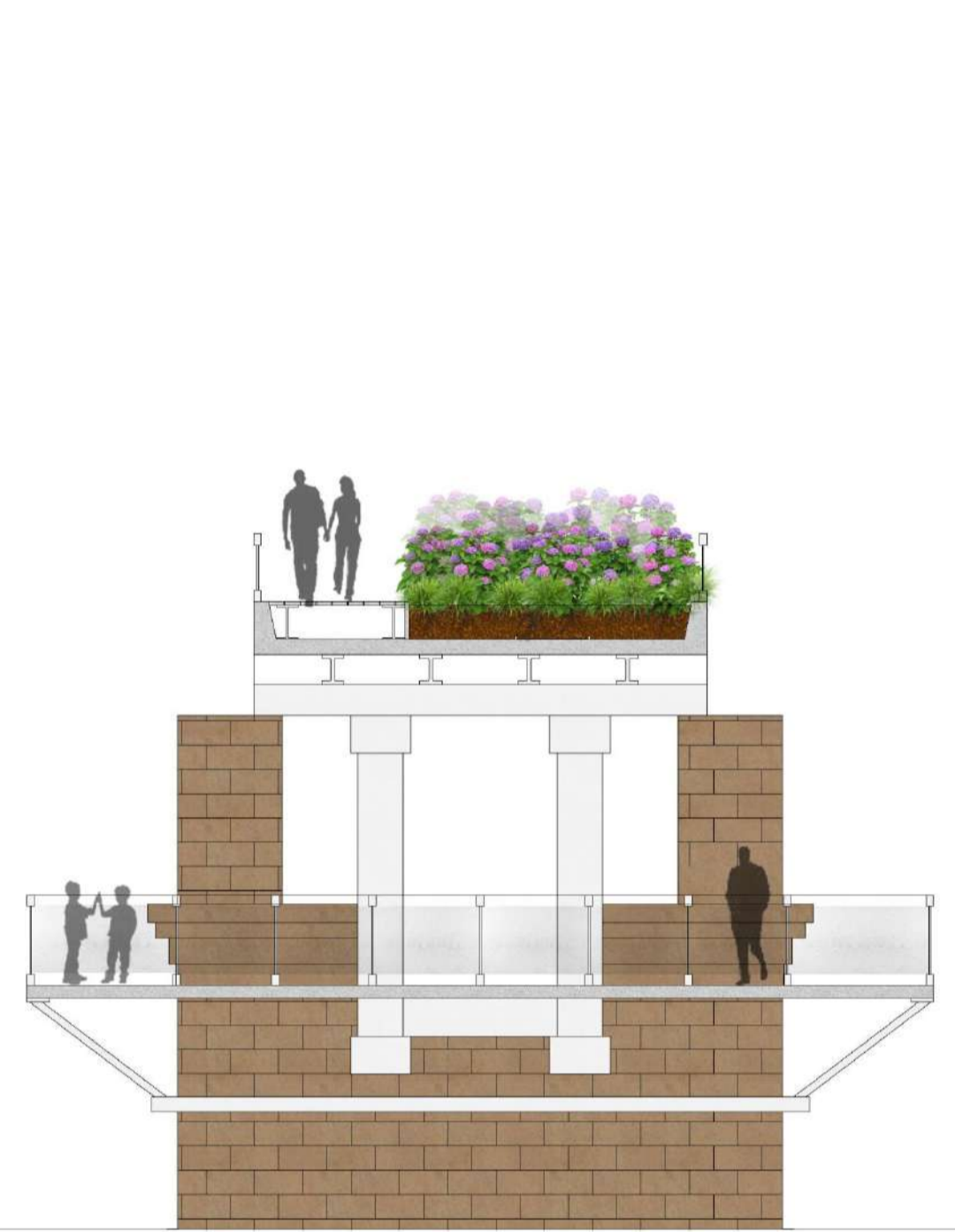
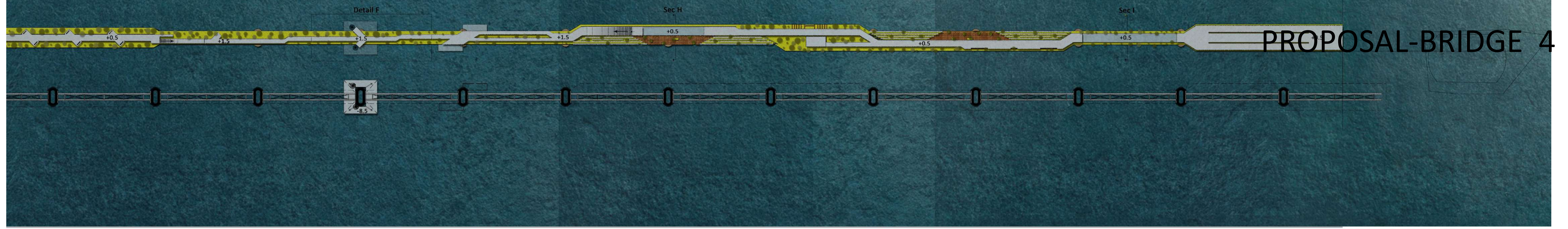


SECTION C



SECTION D





SECTION E



SECTION F



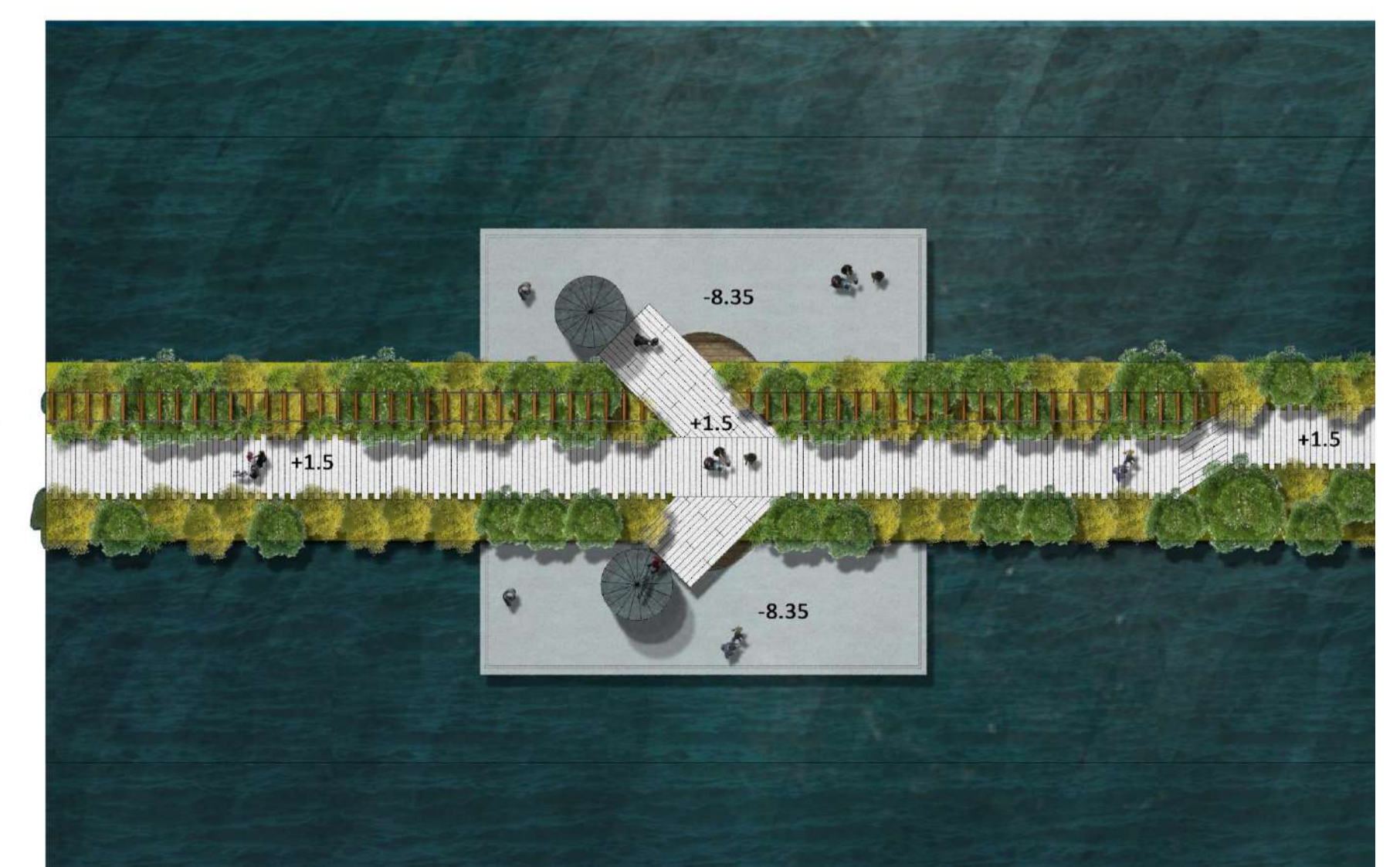
SECTION G



SECTION H



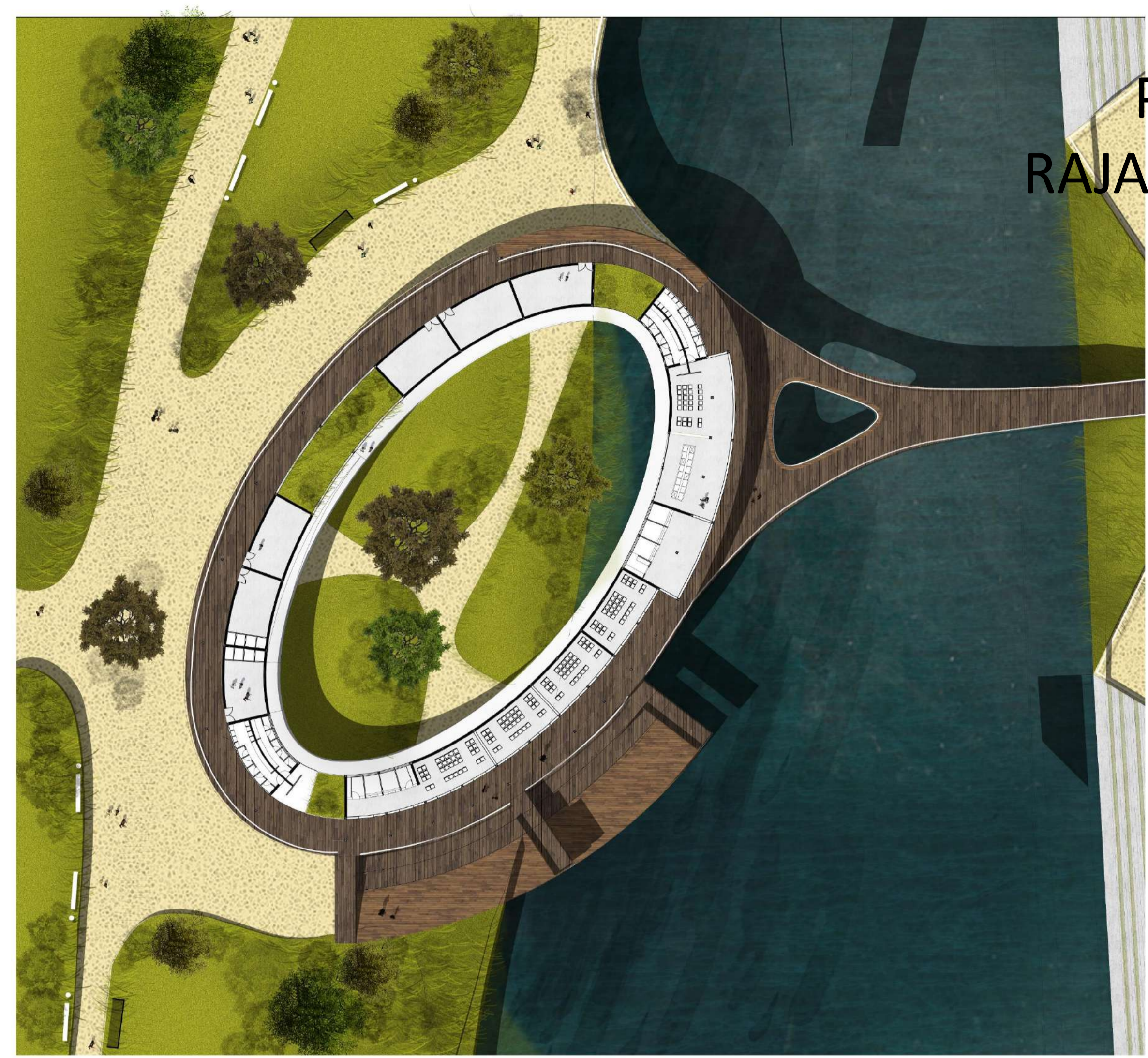
SECTION I



PROPOSAL-  
RAJAHMUNDRY  
ZONEPLAN



PROPOSAL-  
RAJAHMUNDRY  
DETAIL



PROPOSAL-  
RAJAHMUNDRY  
DETAIL



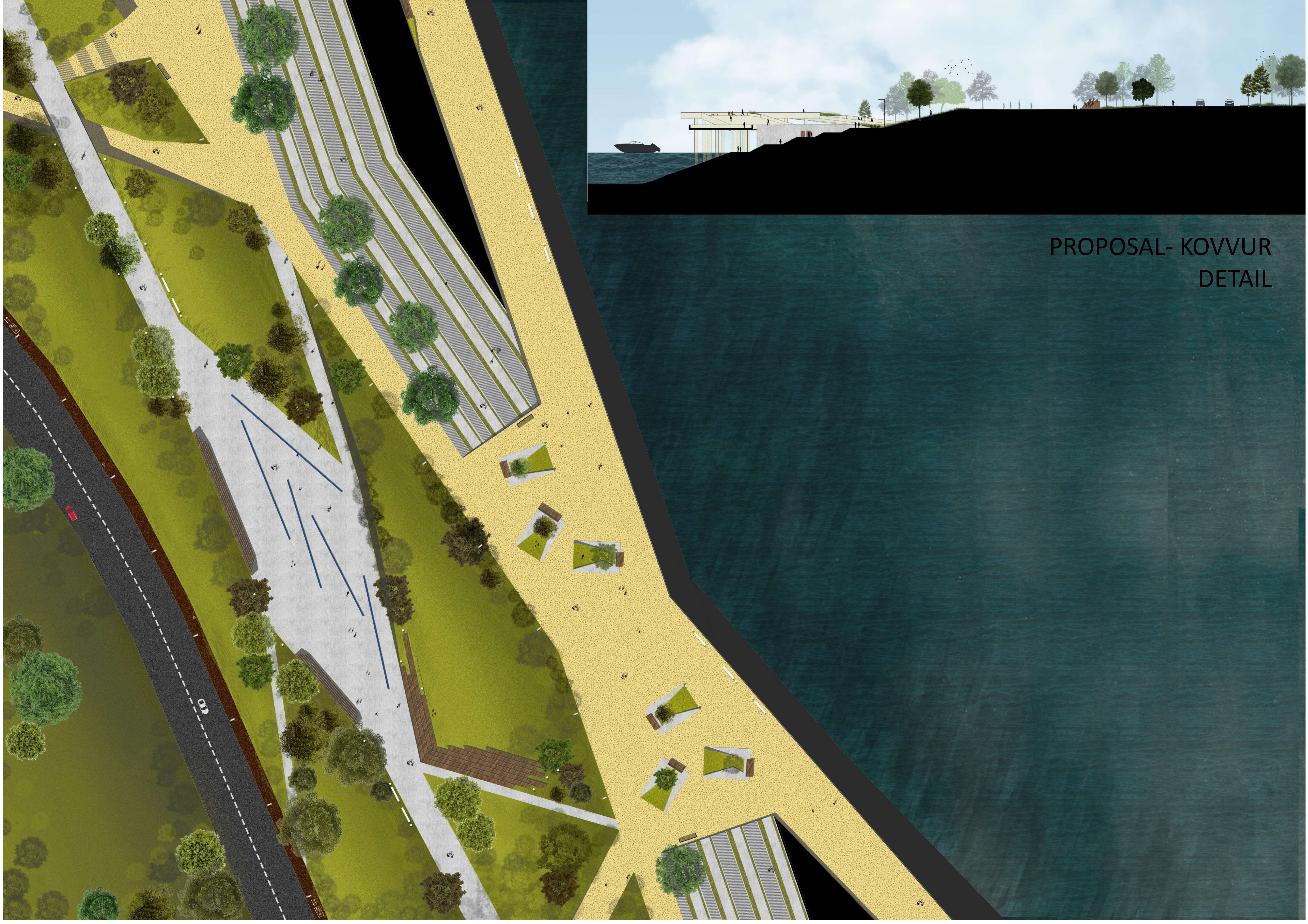
PROPOSAL-  
RAJAHMUNDRY  
DETAIL



1:500

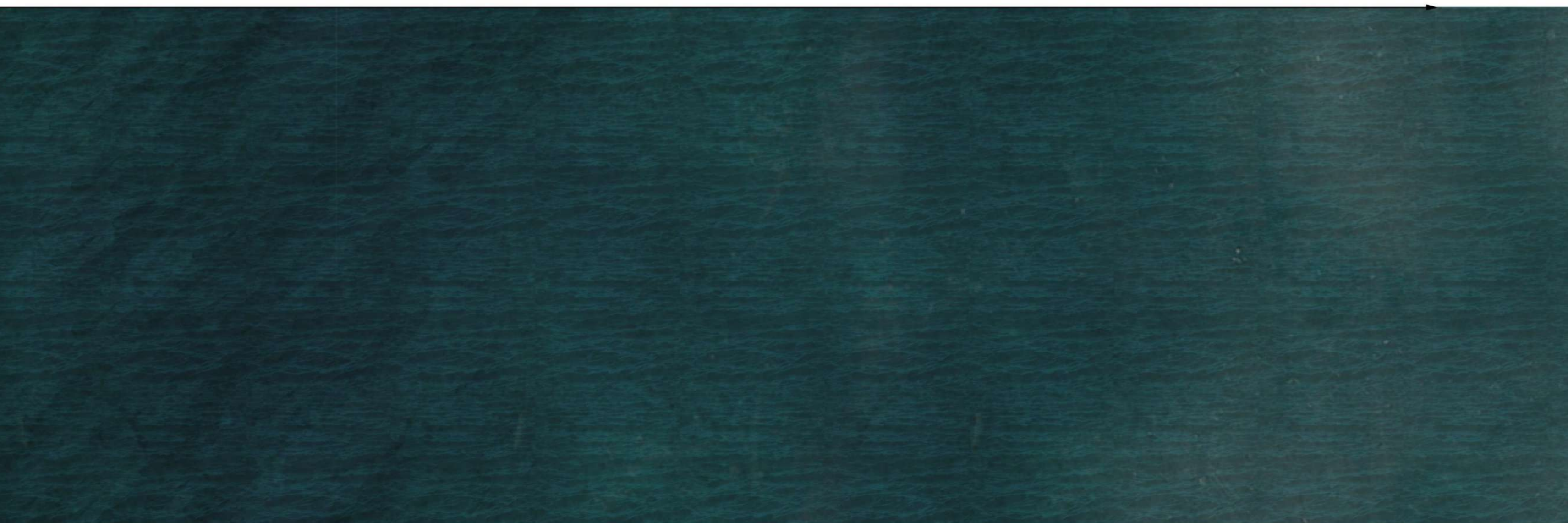
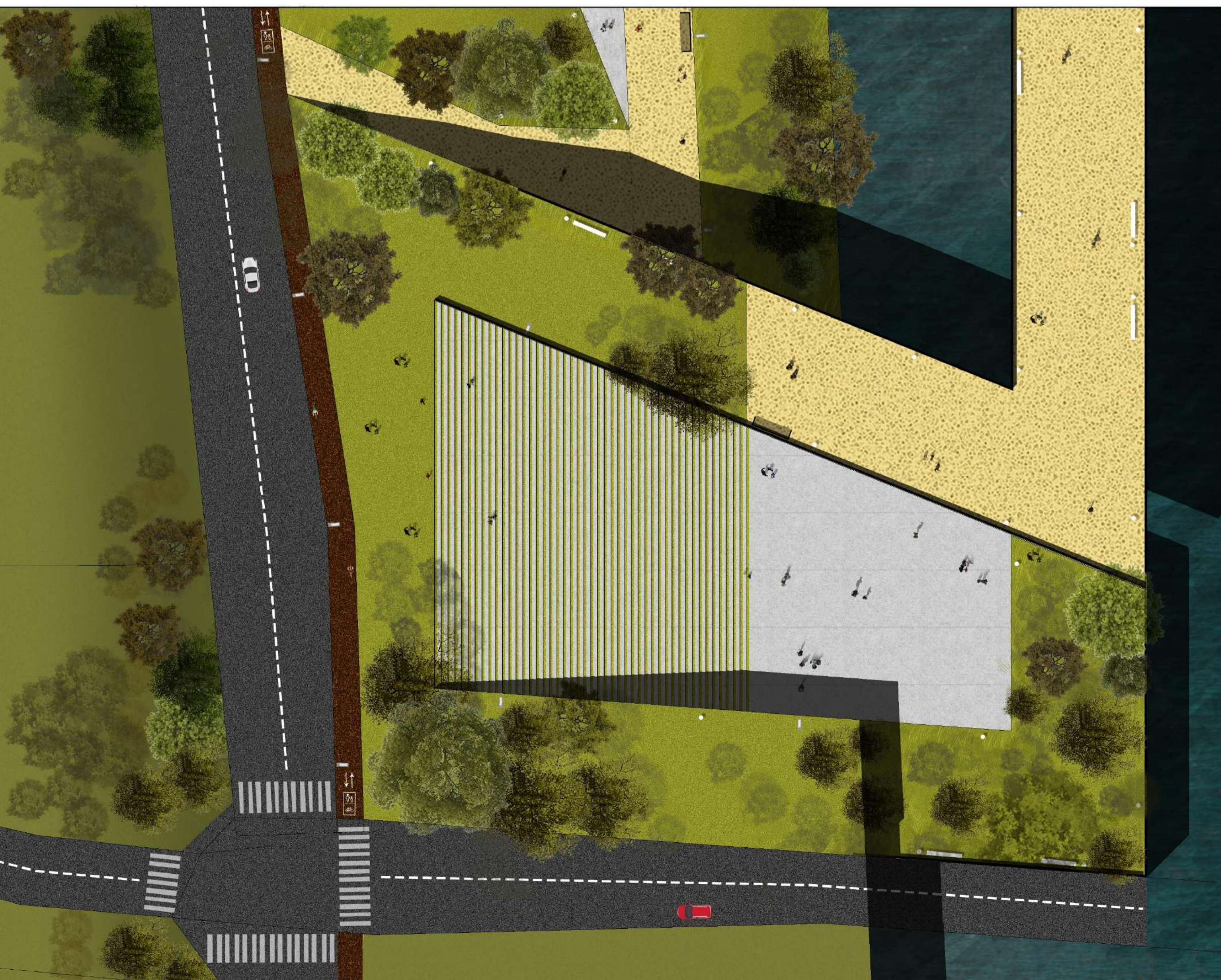
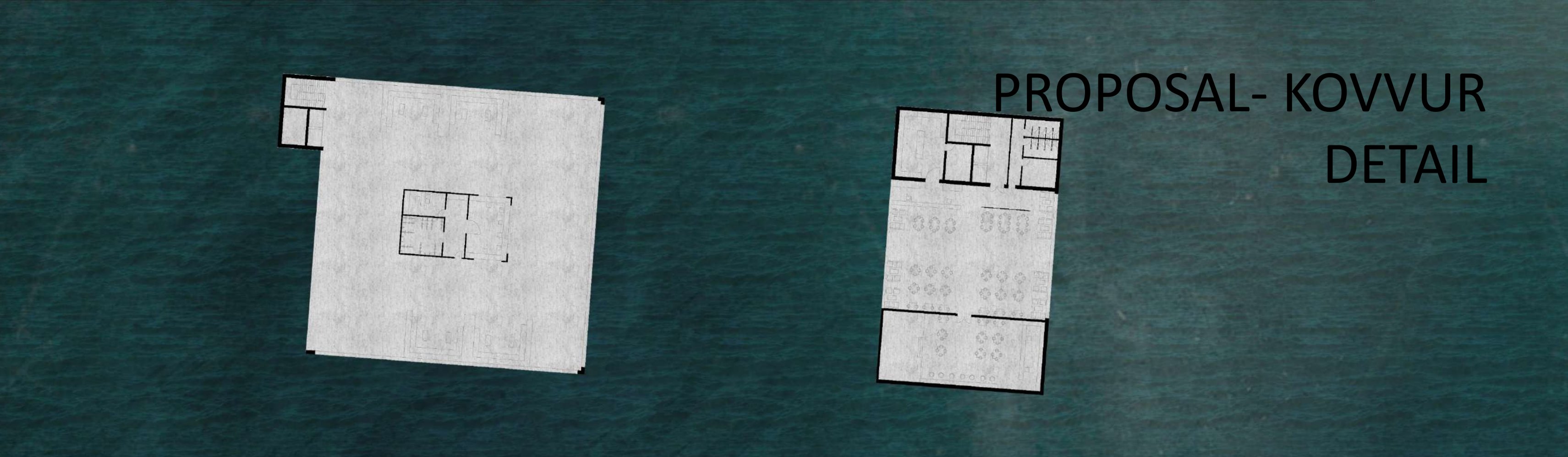
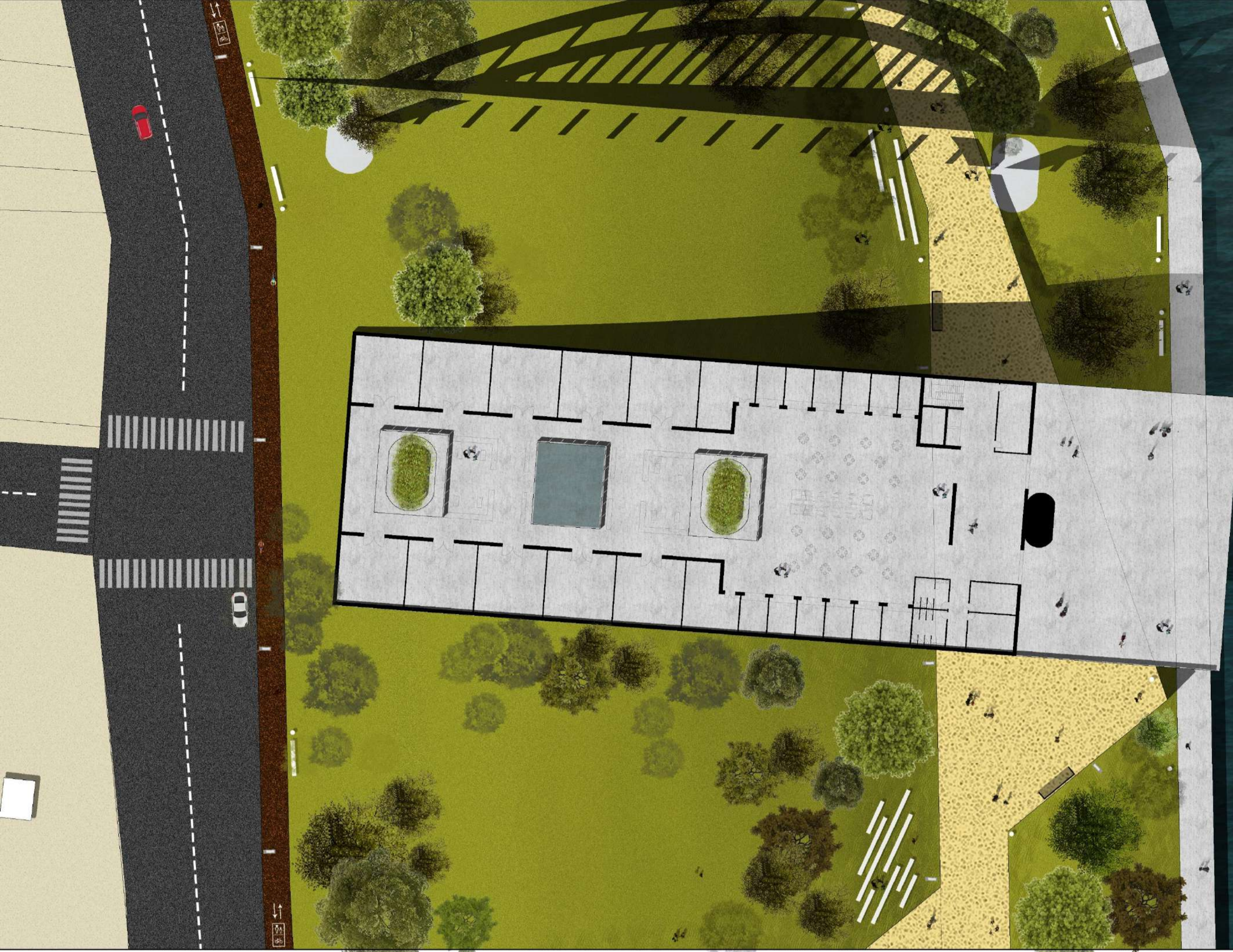
# PROPOSAL- KOVVUR ZONEPLAN



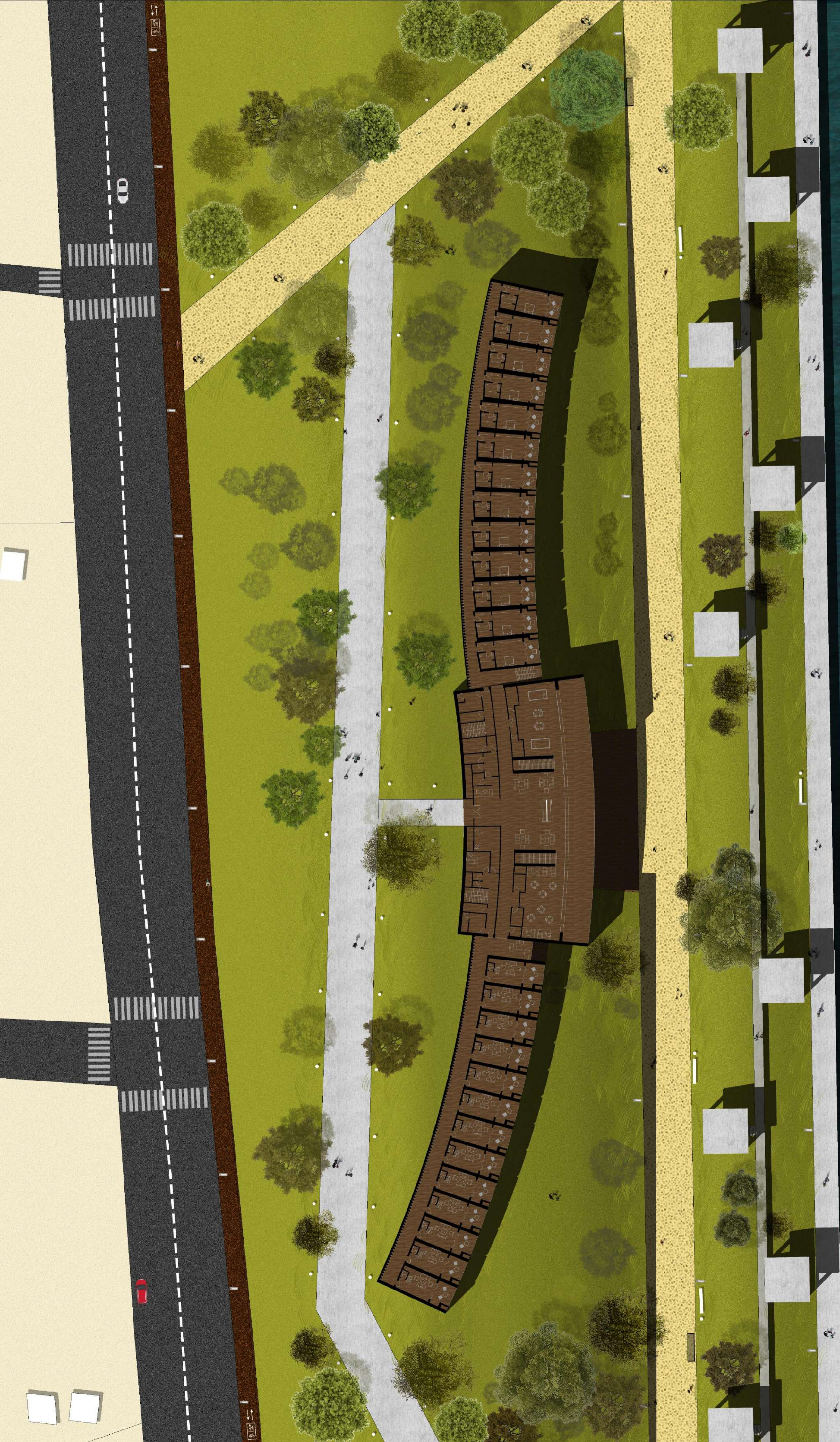


PROPOSAL- KOVVUR  
DETAIL

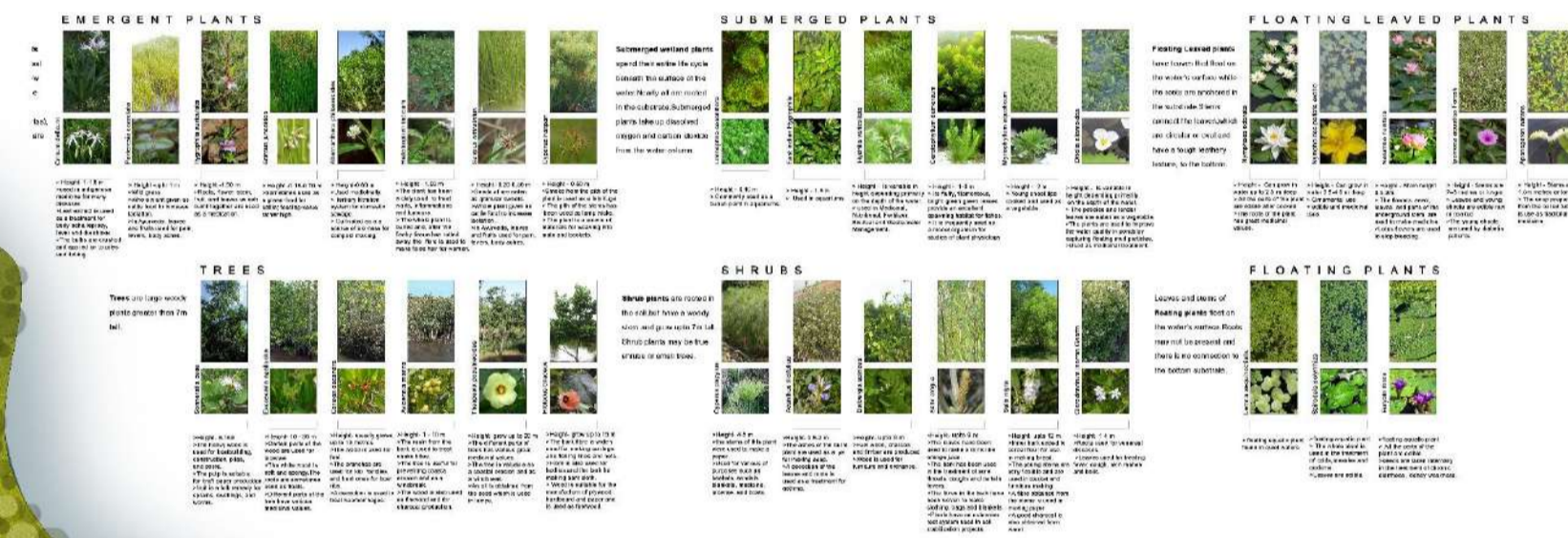
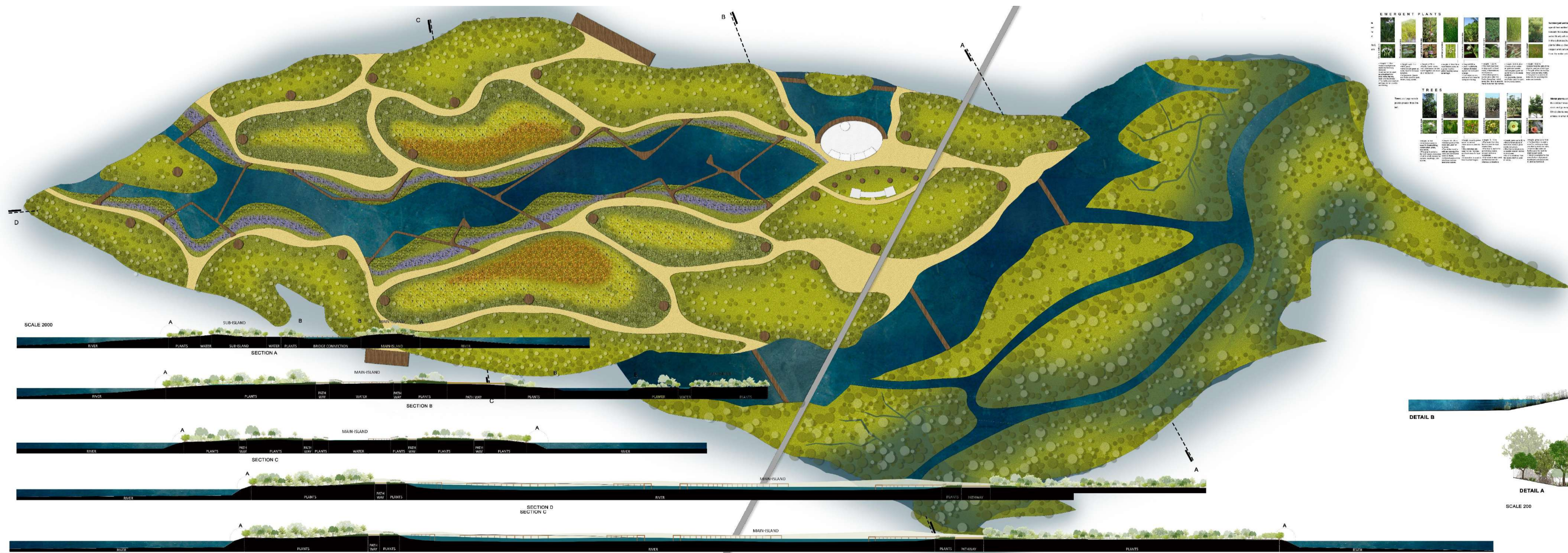




PROPOSAL- KOVVUR  
DETAIL



# PROPOSAL- WETLAND



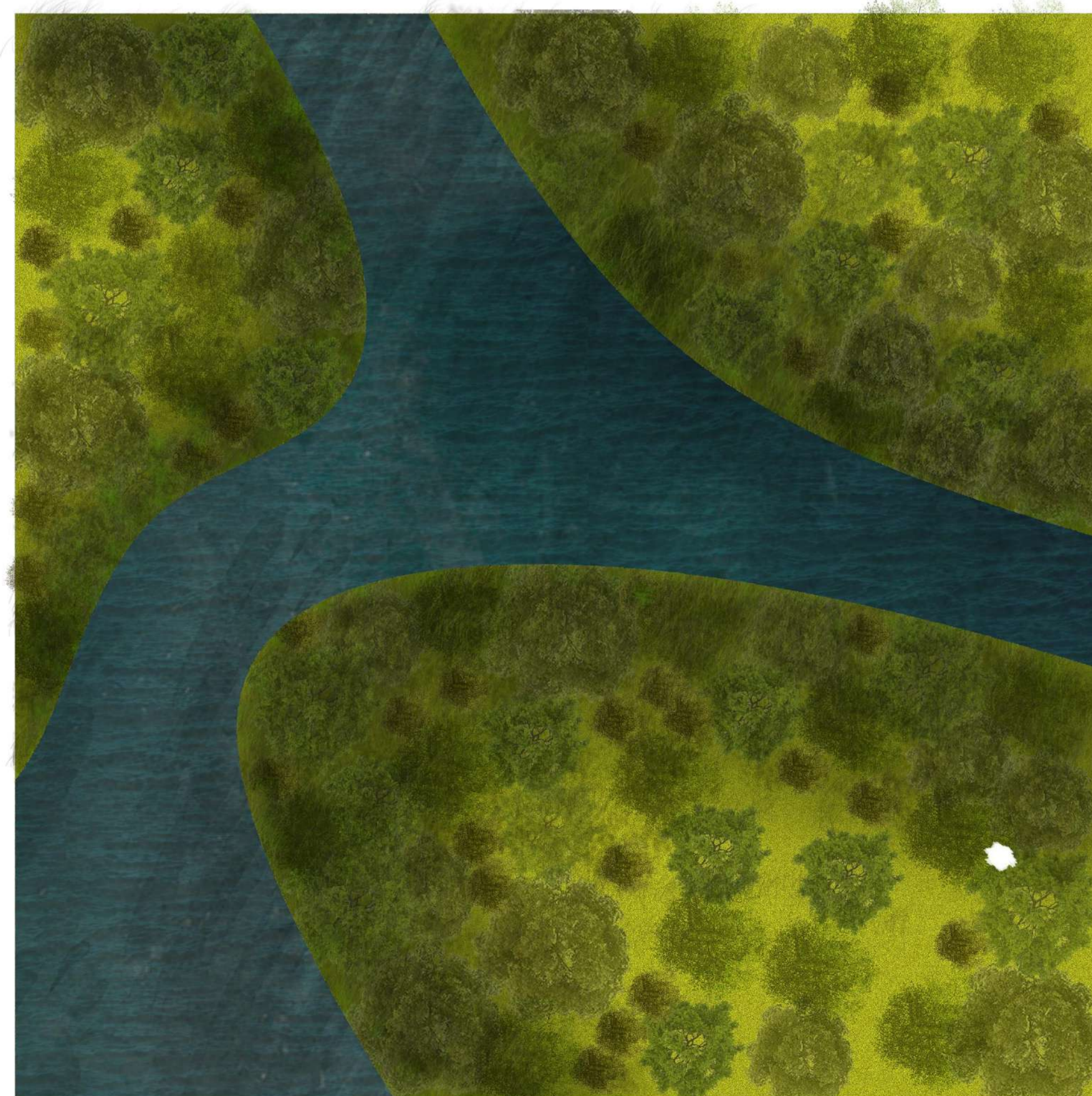
# PROPOSAL- WETLANDDETAIL



DETAIL A



DETAIL B



DETAIL C

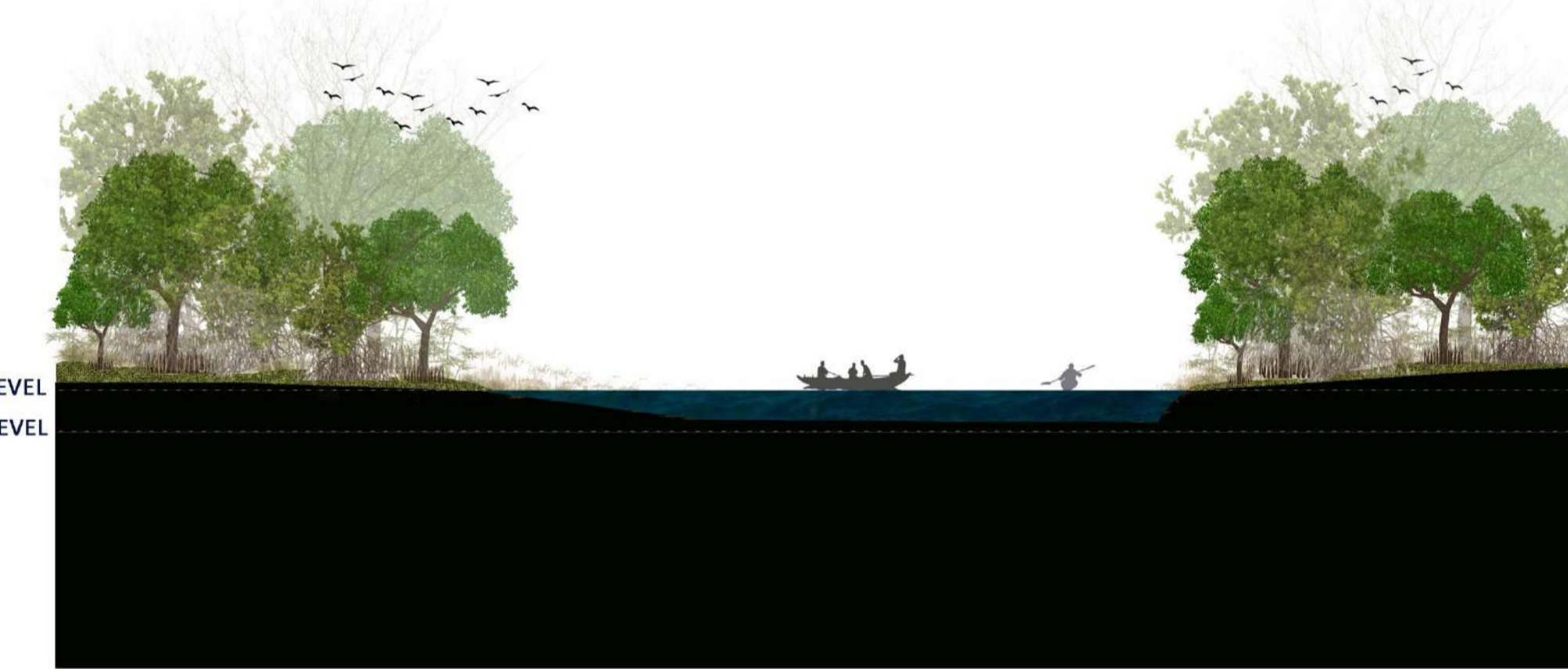


DETAIL D

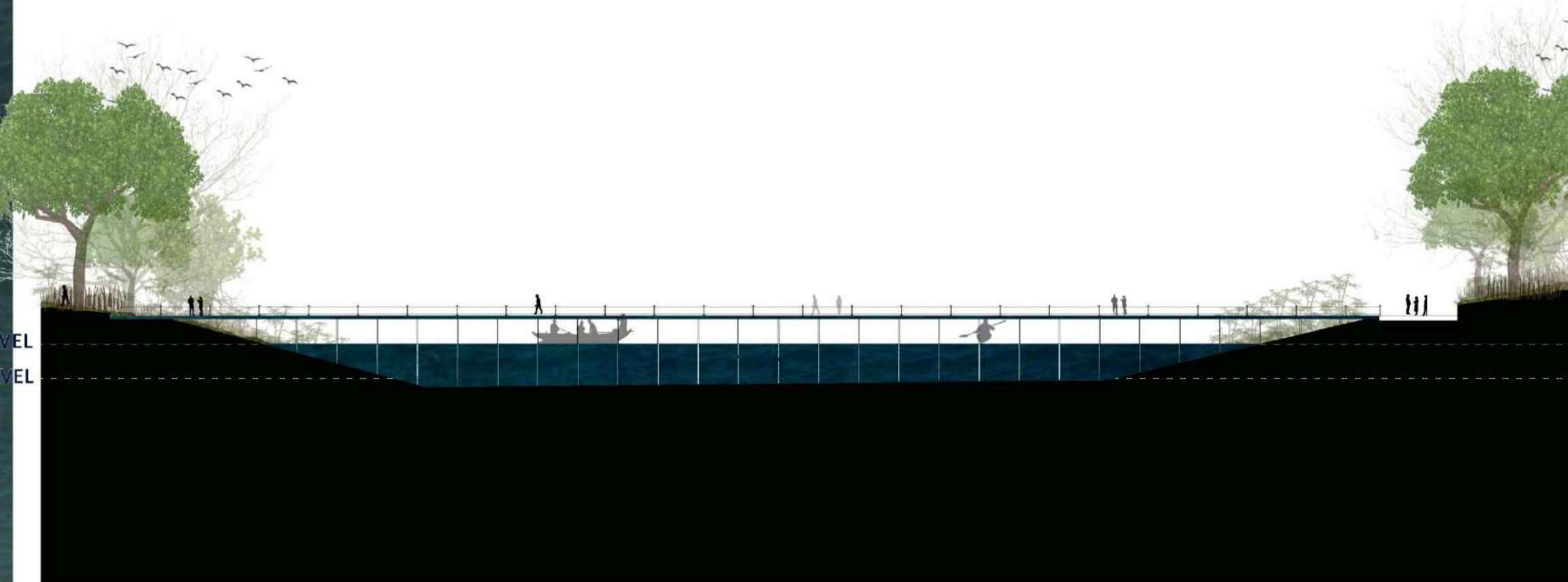
FLOOD LEVEL  
WATER LEVEL



FLOOD LEVEL  
WATER LEVEL

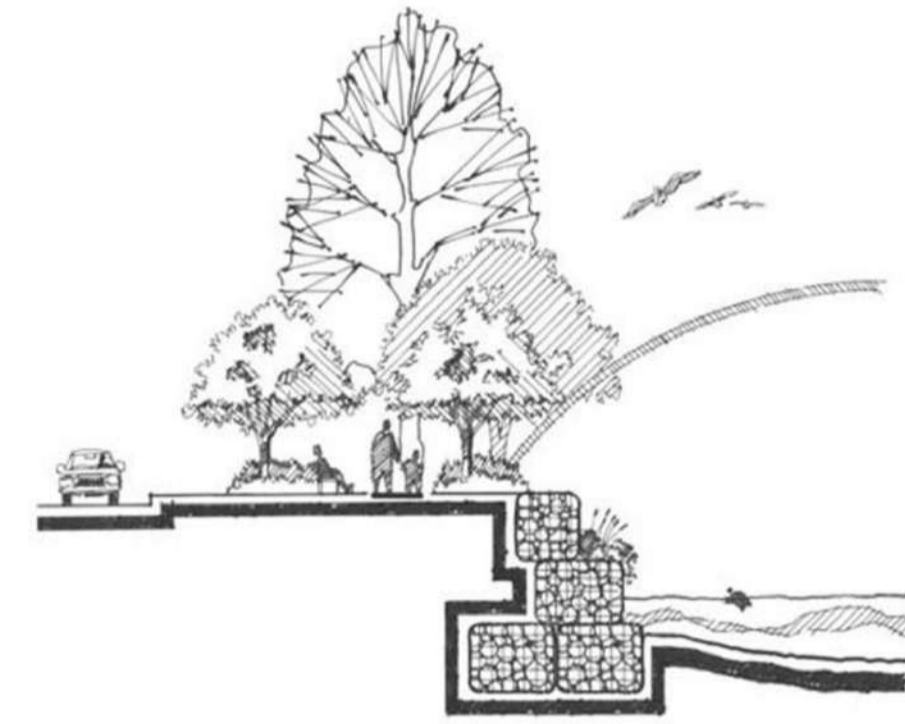


FLOOD LEVEL  
WATER LEVEL

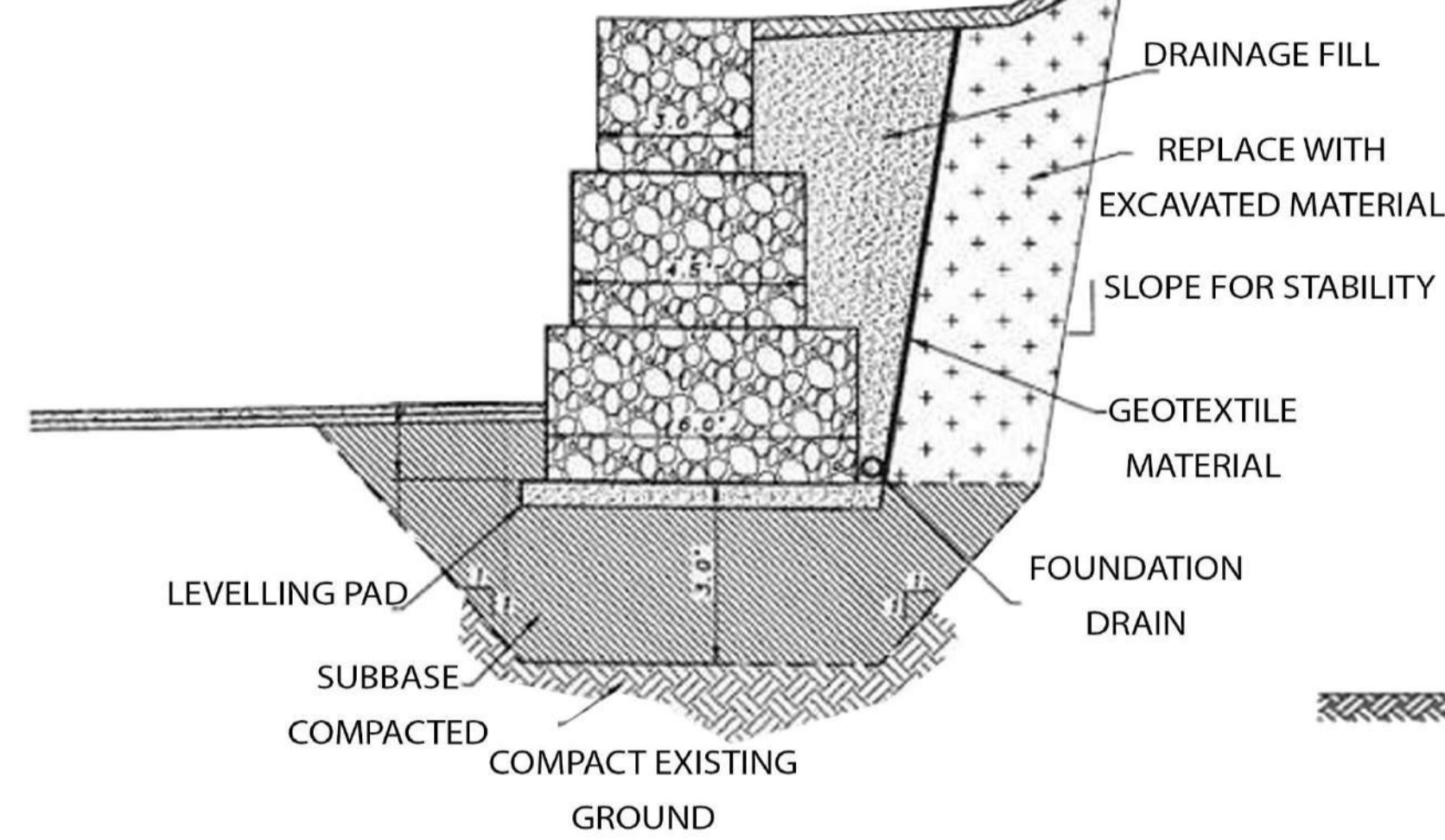


# GABION RETAINING WALL

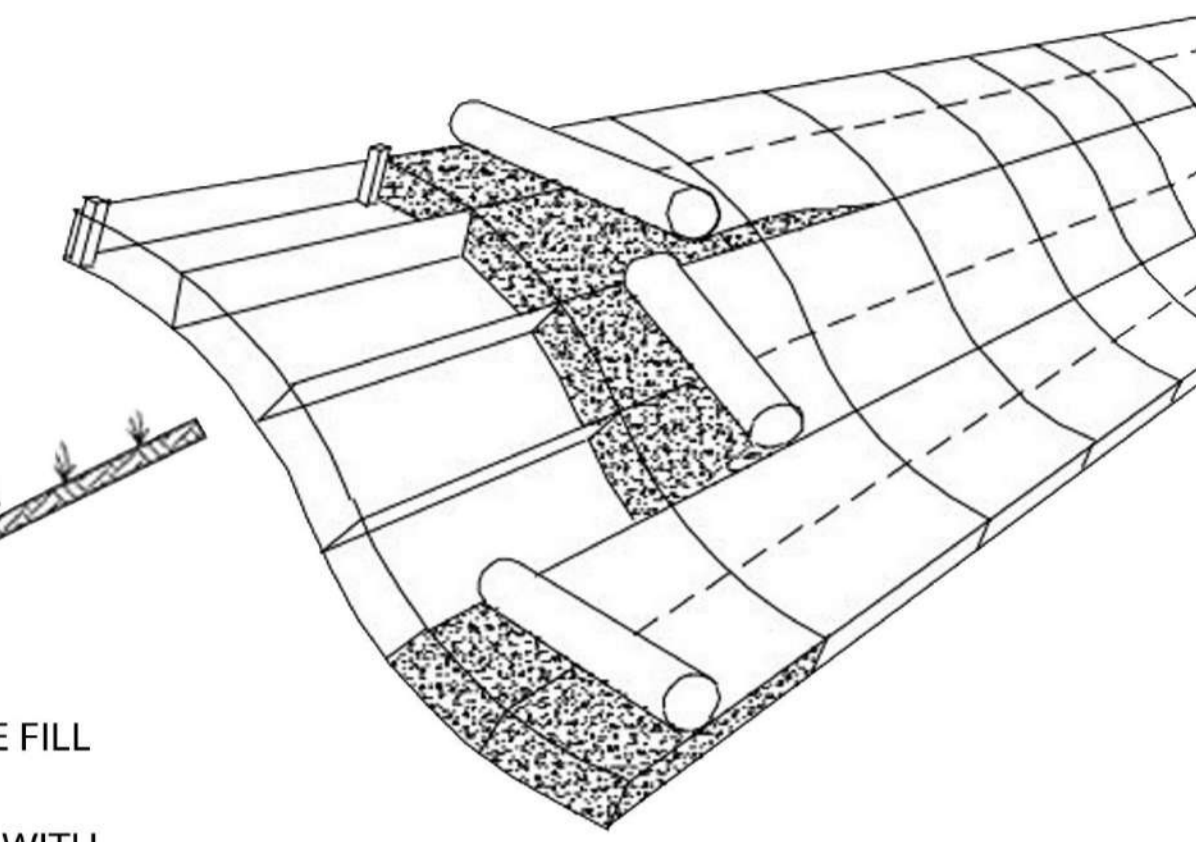
# PROPOSAL-GABBION SYSTEM



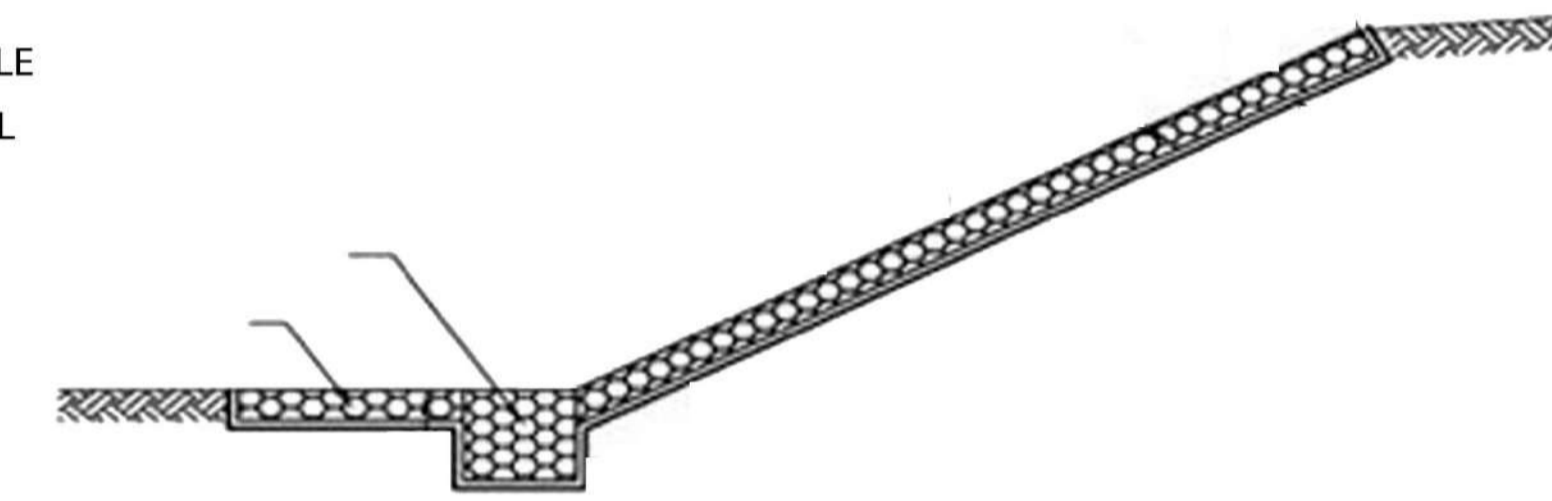
**GABBION RETAINING WALL SECTION**



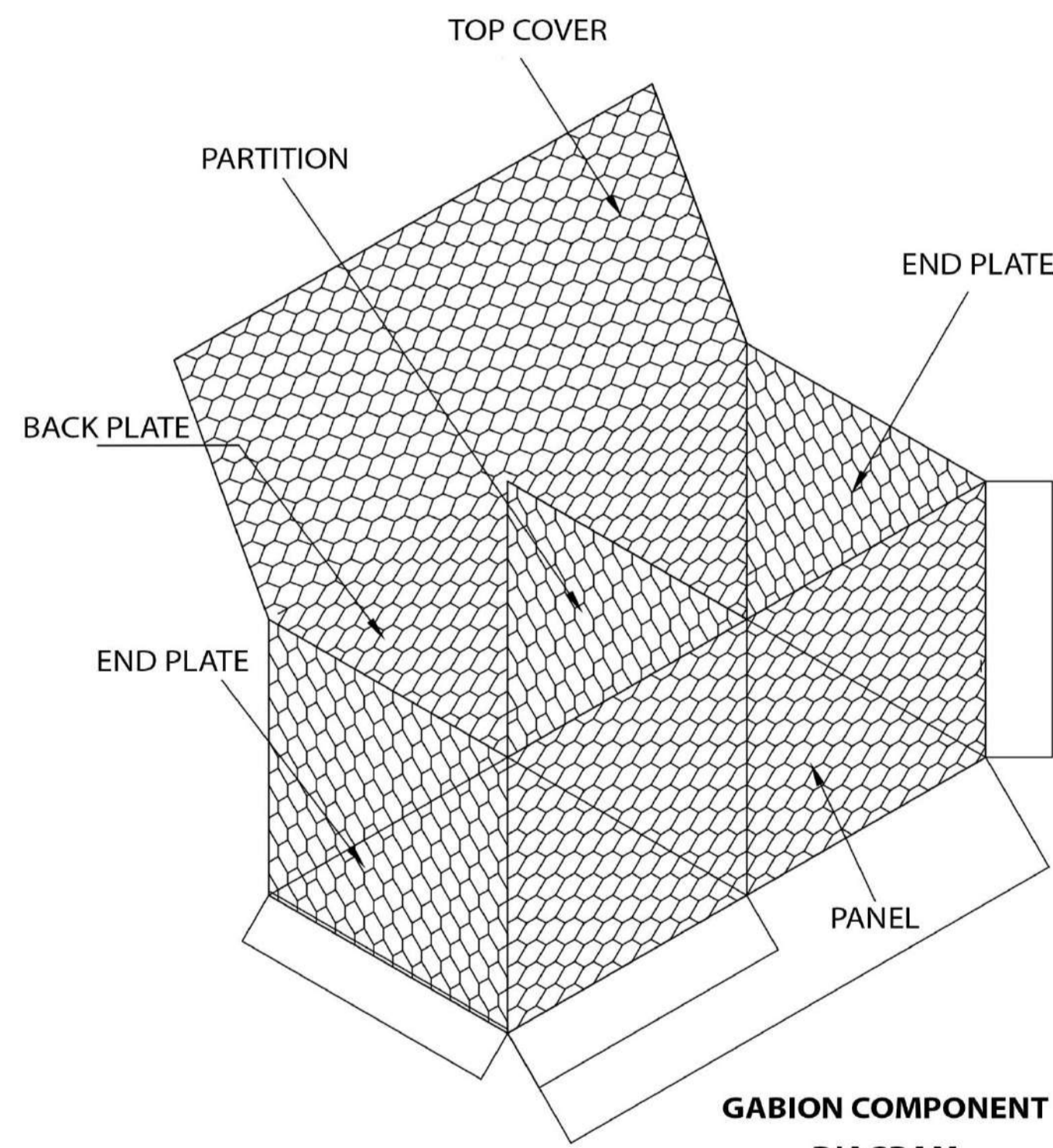
**GABBION RETAINING WALL GALVANIZED PLASTIC GYPSUM DETAIL**



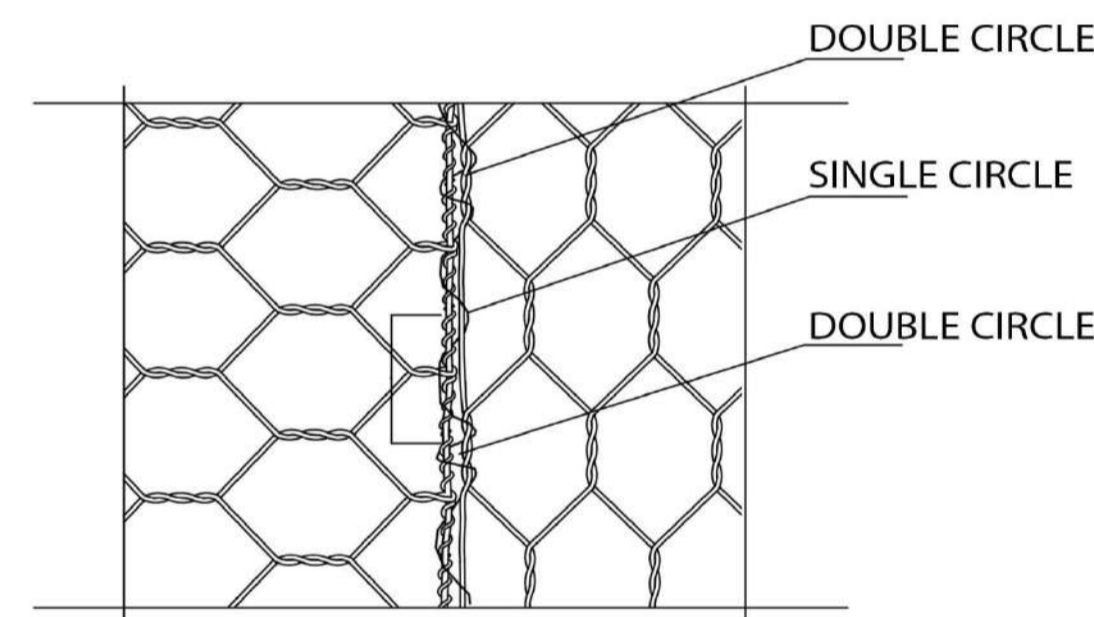
**GABBION MATTRESS**



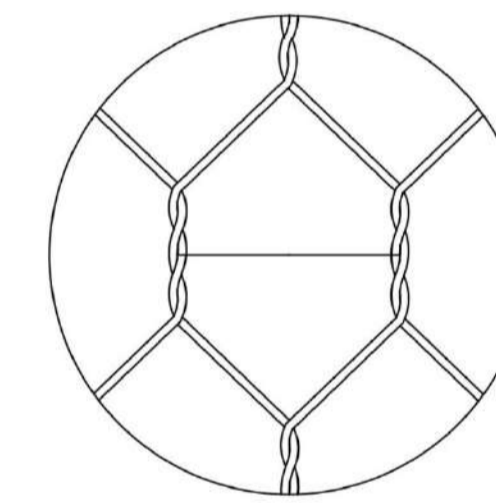
**GABBION MATTRESS FOR SLOPE PROTECTION**



**GABBION COMPONENT DIAGRAM**

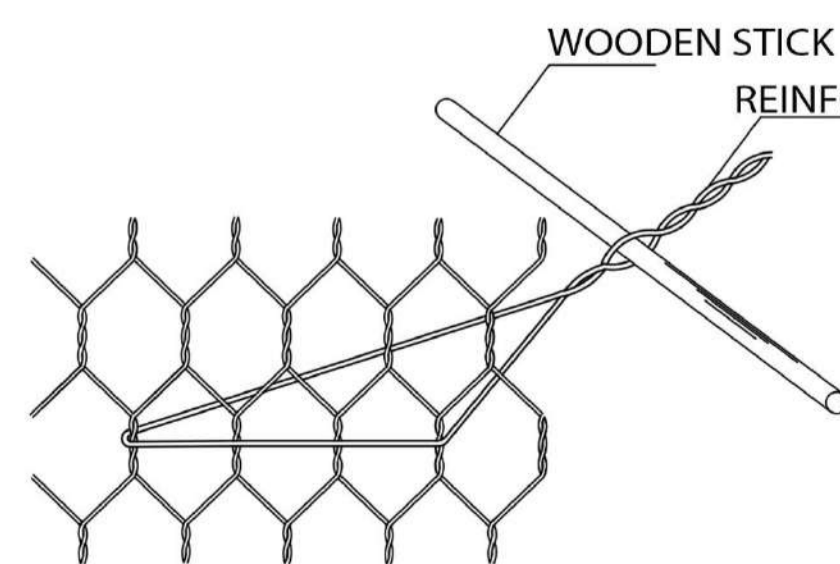


**TWISTED SCHEMATIC**

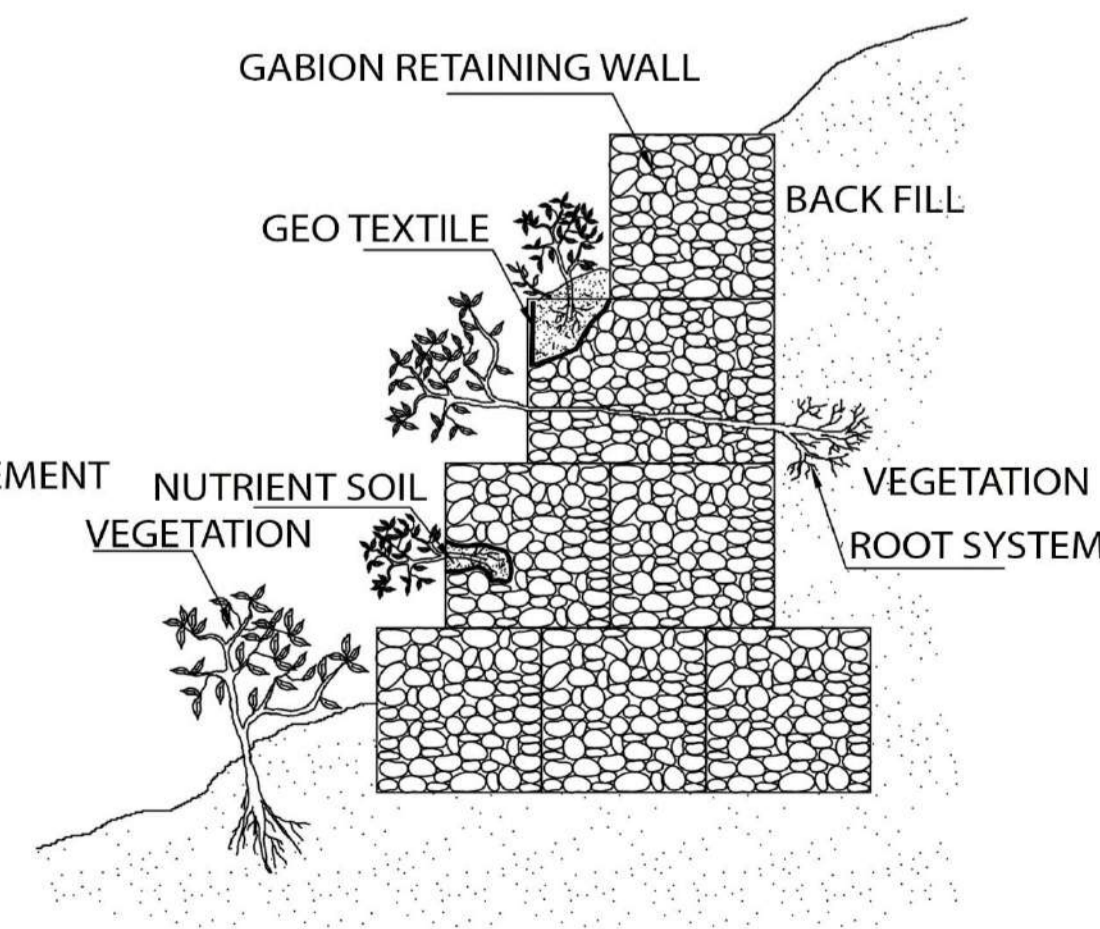


**MESH SCHEMATIC**

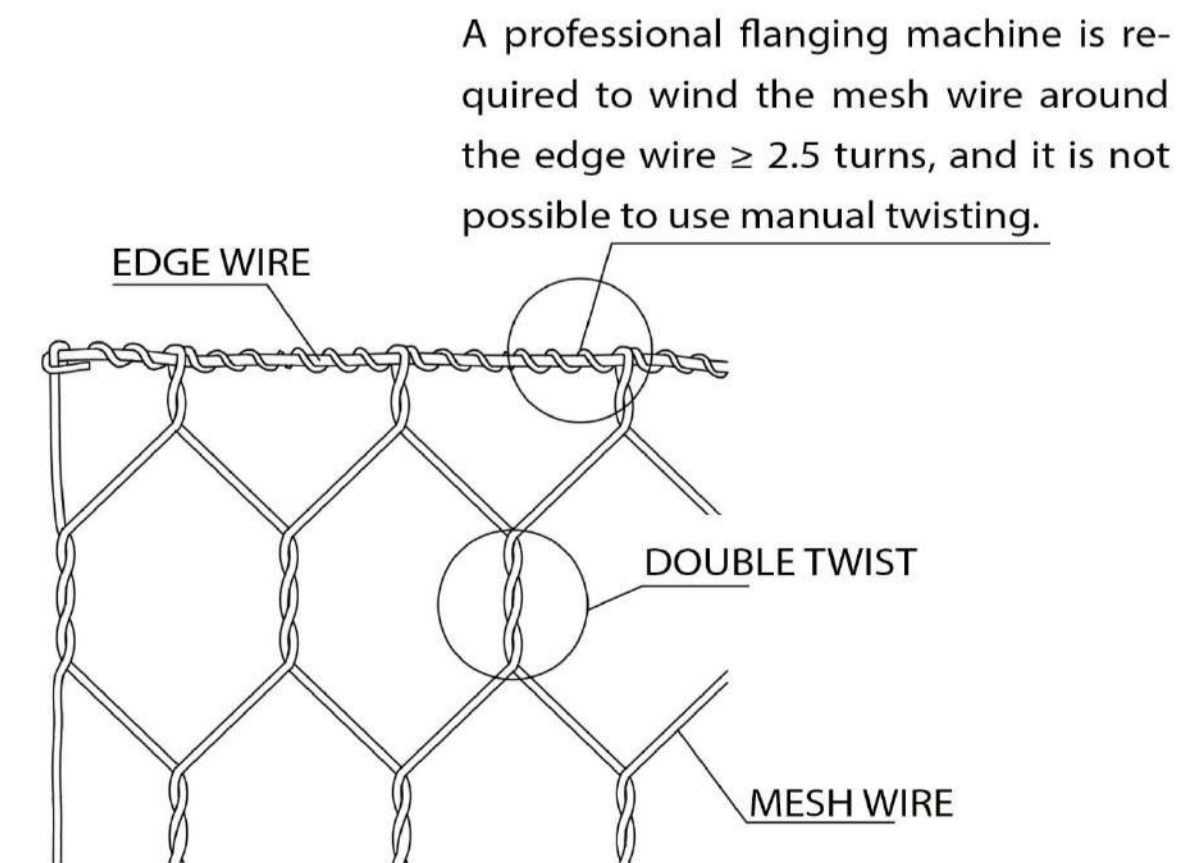
The open grid "D" refers to the distance between the axes of two consecutive stranded wires. The tolerance is determined by the distance between two consecutive twisted axes, taking the average of ten consecutive grids.



**PANEL RIB OPERATION DIAGRAM**



**GABBION RETAINING WALL**



**MECHANICAL FLANGE**

A professional flanging machine is required to wind the mesh wire around the edge wire  $\geq 2.5$  turns, and it is not possible to use manual twisting.