



**Bharati Vidyapeeth (Deemed to be University)**

**College of Architecture, Pune**

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**Architectural Design Project Report Titled**

**JANAKALYAN– REVITALISATION ON THE BANKS OF NAG  
RIVER, NAGPUR -**

**BRIDGING THE GAP WITH NATURE**

**Submitted by**

**JANHAVI NIMJE**

**B. Arch, Semester X**

**Guided by-**

**PROF. MUKTA LATKAR TALWALKAR**



**Bharati Vidyapeeth (Deemed to be University)**  
**College of Architecture, Pune**  
**2022 - 23**

### **CERTIFICATE**

This is to certify that the Architectural Design Project Report titled “**JANAKALYAN– REVITALISATION ON THE BANKS OF NAG RIVER, NAGPUR -BRIDGING THE GAP WITH NATURE**”, is submitted by **NIMJE JANHAVI**, Exam Seat No. **2415940005**, in the semester X of Bachelors of Architecture (2015 course) programme of Bharati Vidyapeeth (Deemed to be University) College of Architecture, Pune is a record of bonafide work, to the best of our knowledge.

Architectural Design Project Guide  
**Prof. Mukta Latkar Talwalkar**

Principal  
**Prof. Dr. Kavita Murugkar**

## ACKNOWLEDGEMENT

Completing my thesis titled "**Janakalyan– Revitalisation On The Banks Of Nag River, Nagpur -Bridging The Gap With Nature**" has been one of the most demanding academic tasks I have ever faced. This achievement would not have been possible without the unwavering support, patience, and guidance of the following people.

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- **Janhavi Nimje**

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## AMENITY CENTER – REVITALISATION ON THE BANKS OF NAG RIVER, NAGPUR - BRIDGING THE GAP WITH NATURE

### **1.1. Introduction:**

Nagpur, a bustling metropolis in the heart of India, renowned for its rich cultural heritage, historical significance, and rapid urbanization, stands as a beacon of growth and development in the central region of the country. As the city experiences a surge in population and infrastructure expansion, there arises an imperative need to cater to the evolving needs and aspirations of its residents. One such critical requirement is the provision of an amenity centre – a multifaceted facility designed to enhance the quality of life and promote community well-being.

An amenity centre serves as a hub for social interaction, recreational activities, and essential services, fostering a sense of belonging and inclusivity among residents. In Nagpur, a city marked by its vibrant diversity and dynamic lifestyle, the establishment of such a centre not only addresses the growing demand for modern amenities but also reflects a commitment to holistic urban development.

This introductory discourse aims to delve into the significance of providing an amenity centre in Nagpur, exploring the myriad benefits it brings to the community, and elucidating the key considerations in its planning and implementation. From promoting health and wellness to fostering cultural exchange and facilitating educational initiatives, the amenity centre emerges as a pivotal component in the urban landscape, poised to enrich the lives of Nagpur's residents and contribute to the city's continued progress and prosperity.

#### **1.1.1. What is Amenity centre?**

An amenity centre is a facility or space within a residential or commercial development that is designed to provide various conveniences and recreational opportunities for the residents or patrons. Amenities typically include features such as fitness centres, swimming pools, community gathering areas, and other leisure facilities aimed at enhancing the overall quality of life for those utilizing the centre. Additionally, amenity centres may also offer services such as concierge, recreational programming, and other lifestyle-related offerings.

#### **1.1.2. What is Revitalisation?**

Revitalization refers to the process of restoring vitality, energy, or vigour to an area, organization, system, community, or environment that has experienced decline or stagnation. This typically involves initiatives and strategies aimed at enhancing and renewing the economic, social, cultural, or physical aspects of the target area or entity. Revitalization efforts often encompass revitalizing urban neighbourhoods, business districts, historic areas, or natural landscapes through urban renewal, economic development, community engagement, and other revitalization tactics. The goal of revitalization is to stimulate growth, improve liveability, and promote sustainability, ultimately leading to a restored and thriving condition.

### 1.1.3. What is Riverfront Development?

It is a space where civic interaction occurs. Along the River. Intent. Parallel connections along the river's edge serve many different users and connect neighbourhoods and development sites to the water, providing public access, opening up views, and re-engaging the rivers as part of the public realm.

## 1.2. Need and Relevance of the Project:

The Nag River is a vital waterbody that runs through the city. With rapid urbanization and industrialization, **Nag River has faced severe pollution and degradation over the years.** There is a **pressing need to rejuvenate and conserve the riverbanks** while also creating recreational and educational opportunities for the city's residents. The design and construction of an amenity centre on the banks of Nag River can address these challenges and present a sustainable solution that benefits the community and the environment

### 1.2.1 Need for an Amenity Centre:

**Environmental Conservation:** The degradation of the Nag River and its banks calls for immediate conservation efforts. An amenity centre can serve as a focal point for environmental education and awareness, promoting sustainable practices and conservation measures.

**Quality of Public Open Spaces:** Every well-planned locality of Nagpur has 2-3 Public open spaces (Garden, Children's play area, Jogging Track) provided by Nagpur Improvement Trust which are moderately maintained, but the old areas of Nagpur for e.g. Mahal, Itwari, Tandapeth etc., doesn't have much public open spaces due to congestion and are poorly maintained.

**Community Space / Recreation:** The city lacks adequate public open spaces for recreation and leisure activities. An amenity centre would provide a much-needed space for the community to come together, engage in outdoor activities, and enjoy the natural beauty of the river.

**Cultural Preservation:** The historical and cultural significance of the Nag River can be highlighted and celebrated through the amenity centre, providing a platform for showcasing local art, traditions, and heritage.

### 1.2.2. Relevance of the Design Project:

**Promoting Sustainability:** The design and construction of the amenity centre can be an opportunity to incorporate sustainable and eco-friendly features, setting an example for environmentally conscious development.

**Economic Development:** The amenity centre has the potential to attract tourists and visitors, contributing to the local economy through increased tourism, the creation of job opportunities, and supporting local businesses.

**Educational Opportunities:** By integrating educational and interpretive elements, the amenity centre can serve as an outdoor classroom, providing learning opportunities about river ecosystems, biodiversity, and environmental stewardship.

Conclusion: In conclusion, the establishment of an amenity centre on the banks of Nag River is a relevant and much-needed project that can bring about positive environmental, social, and economic impacts. The integration of sustainable design principles and community engagement can enhance the overall relevance and success of this project.

### 1.3 Project Background

The Nag and Pilli rivers rejuvenation project also called the **Nag River Pollution Abatement Project** has been pending for many years.

This project will be funded by many agencies. Of total project cost of **Rs 1927 crore** - The **central government will give Rs 1,115.22 Cr**, the **Maharashtra government will give Rs 507.36 crore**, and **Nagpur Municipal Corporation will give Rs 304.41 crore**. The Japan-based Japan International Cooperation Agency (JICA) will lend funds to both central and state governments to pay their shares.

**Initially, the project cost was Rs 1,476.96 crore** as per common schedule of rates in **2014**. Due to delay in the process, **the cost escalated to Rs 2,117.56 crore in 2020**. Chances of further rise in cost cannot be ruled out, **as two years have passed since cost was revised, and the works are likely to take eight years from commencement**.

### 1.4. Aim

The aim is to conceptualize and develop a sustainable amenity centre on the banks of Nag River in Nagpur. The project will focus on integrating environmentally conscious design practices, promoting community engagement, and contributing to the preservation and revitalization of the river ecosystem. By leveraging sustainable approaches and innovative design strategies, the aim is to create a multifunctional amenity centre that not only enhances the recreational and cultural experiences of residents and visitors but also champions the conservation and sustainable development of the Nag River area.

### 1.5. Objective

The riverfront, a word used to refer to any area where land meets water, is a special place inside a city. It **serves as a transitional area between the city and the water**. In addition, it is a hub for the urban landscape, a **popular tourist destination, and the epitome of urban growth**.

#### 1.5.1. Objectives also includes:-

- **Promote Community Engagement:** Develop spaces that encourage social interaction and community gatherings incorporating recreational areas, seating, and event spaces for diverse community activities.
- **Integrate Cultural and Historical Significance:** Incorporate elements that celebrate the cultural heritage and history of Nagpur. Showcase local art, traditions, or historical references in the design.



- **Man Water Relationship:** Enhancing connectivity -Designed pathways, bridges, and viewing points that provide direct and immersive experiences with the Nag River, fostering a deeper connection between visitors and the water.
- **Getting People to Water:** Design areas along the riverbanks that provide tranquil and reflective spaces, promoting mental well-being and connection with nature.

## 1.6. Scope of the Project

The project’s scope includes – architectural design, universal design, landscape design and sustainability.

**Sustainable Design Concept:** Sustainable design concepts can significantly enhance urban spaces by addressing **environmental (Biodiversity Preservation, Climate Mitigation)**, **social (Improved Quality of Life, Community Engagement and Social Equity)**, and **economic (Job Creation)** aspects.

**Public Amenities:** for enhancing the overall quality of urban spaces and fostering a sense of community well-being. Public amenities should be designed to be inclusive, catering to people of all ages, abilities, and backgrounds. This promotes social equity and ensures that urban spaces are accessible to everyone.

**Landscape:** Incorporating green spaces and landscaping in public amenities provides residents with natural environments, which have been shown to have positive effects on mental health, stress reduction, and overall life satisfaction.

**Universal Design Approach:** Consideration of universal design principles in public amenities ensures that they are usable and enjoyable by as many people as possible, regardless of their physical abilities or disabilities.

**Water Recreation:** Well-designed public spaces and amenities contribute to a city's appeal, attracting tourists and potentially boosting economic development through increased tourism-related activities.

## 1.7. Methodology



The methodology adopted for this research paper on providing an amenity centre in Nagpur encompasses a comprehensive approach involving several key stages. Firstly, an in-depth data collection and literature review is conducted to analyse existing scholarly works, urban development literature, and case studies pertaining to amenity centres and community facilities. This review provides a theoretical foundation and informs the research design. Subsequently, a needs assessment is conducted through surveys, interviews, and focus group discussions with residents, community leaders, and stakeholders in Nagpur to ascertain their requirements, preferences, and priorities regarding amenity centres. This empirical data is crucial for identifying specific amenities and services needed and understanding the existing gaps in amenity provision. This ensures community participation, fosters ownership, and incorporates diverse perspectives in the planning and implementation phases. The design and programming stage involve collaboration with professionals to develop a conceptual design that optimizes functionality, inclusivity, and sustainability.

Financial planning and resource mobilization strategies are devised to secure funding and ensure the long-term viability of the amenity centre. Finally, evaluation and monitoring mechanisms are established to assess the effectiveness, impact, and utilization of the centre, facilitating continuous improvement and adaptation to community needs.

### 1.8. Focus Area of the project

- i. Rejuvenation of Nag River by Creating Riverfront
- ii. Interactive - Amenity Spaces
- iii. Increase Tourism

### 1.9. Principal Users of the Project

- **All age group users – General Public:** Amenity centres often aim to community engagement and interaction by providing space or people of every age group.
- **Tourist and Visitors:** Riverfront Developments are often tourist attractions, offering insights into the man-water relationship, recreation facilities, local culture, history, and traditions.
- **Artist and Performers – (Local as well as National):** Art gallery are essential for artists and performers to showcase their work, it may host exhibitions and workshops. Performance hall will provide a platform to various artist. They may host competitions, theatre (drama), orchestra and other artistic effects.
- **Yoga and Practitioners – Community Members:** They can create awareness about Yoga, inner peace and meditation.
- **Spiritual Institution – Educators and learners:** Meditation halls are valuable educational & Spiritual resources. They may offer workshops, lectures, and programs for learners and educators to enhance their understanding of Yoga and meditation.

### 1.10. Norms and Laws

- i. Area between blue flood line and red flood line shall be restrictive zone for the purposes of construction. The construction within this area may be permitted at a height of 0.45 m. above the red flood line level.
- ii. The area between the river bank and blue flood line forms part of the entire plot in Development Zone, then, FSI of such part of land may be allowed to be utilized on the remaining land.
- iii. A distance of 6 m. from the edge of water course is to be left as marginal distance for construction of any building.

### **2.1. Literature Review**

#### **2.1. Impact of Urbanization on River and Its Surrounding Structures: Case of Nag River Nagpur (Mudholkar, 2018)**

Nagpur's population and other socioeconomic indices have changed significantly as a result of the city's quick urbanisation and economic growth. Many farmed lands have been replaced with building sites due to the rapid urban sprawl, but it should happen in a planned way. A growing population near a river will undoubtedly disrupt and interrupt the waterway. Living next to a river has negative effects on the ecosystem, human health, and civil structure. Urbanisation is a result of the physical development of urban areas brought about by the migration of people from rural to urban areas. Rivers worldwide are subject to anthropogenic weights such as urbanisation, industrialization, and population growth, which alter stream basins.

The infrastructure of Nagpur Municipal Corporation is insufficient to gather and handle all of the city's sewage. Due to the inability of civic bodies to create an appropriate environmental infrastructure for environmental protection, pressure on environmental degradation has intensified, mostly as a result of untreated or partially treated wastewater being dumped into the Nag River. According to laboratory data, the concentration of salts and acids in the water increases from the river's second point to its tail. The results of laboratory testing have shown that there is a high and fluctuating concentration of heavy metals, such as lead, arsenic, and others. As a result, people's health is declining and they are experiencing issues with their liver and stomach. The ecosystem of rivers has collapsed and nearly no species can survive in them as a result of carcinogenic compounds found in river water.

#### **2.2. Urban Riverfront Management (Gole, 2014)**

The deplorable state of India's urban rivers, laden with pollution and waste, poses grave health risks to citizens. To remedy this, restoring natural river systems and eco-conscious redevelopment of riverfronts are essential. This entails rejuvenating stream channels, buffers, and banks, alongside integrating public amenities. Ignoring factors like sewage alternatives and habitat restoration undermines river health. India must adopt holistic environmental planning, drawing insights from successful models in Western cities.

#### **2.3. A Case Study of Godavari Riverfront Development, Nanded City (Patel, 2020)**

Nanded aims to revitalize its riverfront, transforming it into a vibrant urban core. However, slum encroachment and littering mar its appeal, prompting affluent residents to migrate to better-equipped areas. The lack of basic amenities such as clean roads, parks, playgrounds, and security in the city center exacerbates the issue.

Moreover, the underutilization of riverbank land and illegal occupation hinder development efforts. To address this, comprehensive urban planning and investment in infrastructure are essential to reclaim the riverfront as a bustling center of sociocultural, intellectual, and economic activities, fostering inclusivity and prosperity for all residents.

#### **2.4. Assessing the Impacts of Ecological Framework of Indian Riverfront Revitalization Projects** (Simons et al., 2023)

Urban waterfronts have evolved into vibrant hubs for recreation, tourism, and economic activities, anchoring social, cultural, and religious events. Initially developed to bolster neighboring cities' industrial-era prosperity, contemporary riverfront revitalization projects underscore the need for environmental sustainability. This paper examines Sabarmati and Patna riverfronts in India, comparing their development strategies and ecological challenges. It explores the interplay between rivers and environmental concerns, assessing ecological improvements' positive impacts on social and economic dimensions. Aligning with UN Sustainable Development Goals, successful projects prioritize social inclusivity, economic vitality, and environmental health, ensuring long-term community and ecosystem well-being. This research showcases holistic, sustainable urban development potentials through riverfront revitalization, offering insights for future projects.

#### **2.5. Spatial Assessment of Wastewater Quality of Nag River** (Sangode et al., 2019)

This paper's goal is to examine, using surface water concepts, the intermittent water nature of the extremely dirty Nag River. The industrialization and urbanisation surrounding the stream banks in Nagpur is rapidly deteriorating the quality of the stream water. In order to determine the level of contamination in the water body, it is therefore tempting to examine the water quality of the waterways. The river flow should be viewed as "sluggish," and other from the suspended particles settling down throughout the flow and adding to the resistance to flow, it is unlikely to undergo "self-purification." Every station had a pH that was almost neutral. All testing centres' estimates of BOD and COD were abnormally high as compared to the MPCB benchmarks of 30 mg/L to 250 mg/L.

#### **2.6. Studies on Water Quality of Nag River Flowing Through Nagpur** (Paul & Rasekar, 2014)

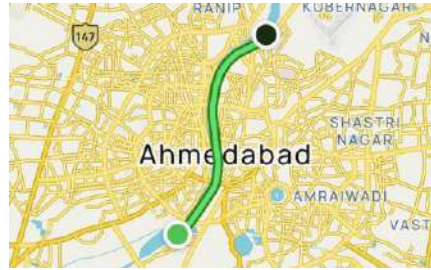
The environment of the Nag River is impacted by human activity and intervention. Untreated sewage and industrial effluents with a capacity of 345 MLD are discharged into the river, giving it a dark grey appearance and an unpleasant odour outside of the monsoon season. Growing *Typhalatifolia* and *Cannalily* plants along the river's banks will improve the aesthetics of the waterway and prevent solid particles from entering the stream, which will lessen the pollution in the Nag River.

To lessen the amount of household waste and liquid waste that is directly disposed of into the Nag River, low-cost sanitation practices should be implemented all along the river. Restructuring the banks' edge by building divider walls to create an appealing separation between residential neighbourhoods and other industrial locations. In general, the Mokshdham should embrace the tradition of having electric crematoria, particularly because it allows for the direct dumping of ashes and leftover bamboo into the river while also lowering air pollution. To ensure that the groundwater quality is not impacted, the percolation trenches should be excavated further down the river's bed.

# CHAPTER 3 – CASE STUDIES

## 3.1. SABARMATI RIVERFRONT DEVELOPMENT, AHMEDABAD – GUJARAT (BOOK)

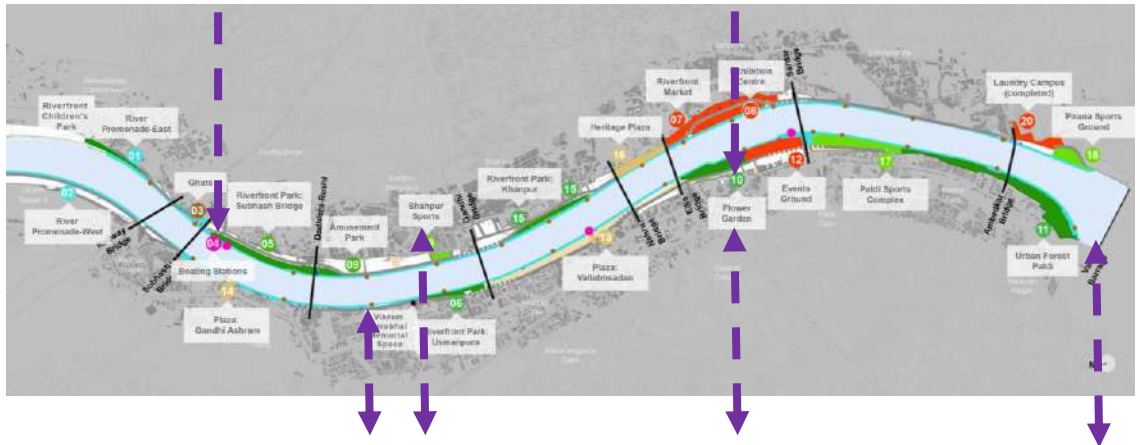
- ❖ Architect : Dr. Bimal Patel
- ❖ Site Area : 506 Acres
- ❖ Proposed In : 1960
- ❖ Construction Started : 2005
- ❖ Open For Public : 2012
- ❖ Location: Ahmedabad, Gujarat



### ❖ Master Plan:



Riverfront park



### PUBLIC RECREATIONAL SPACES



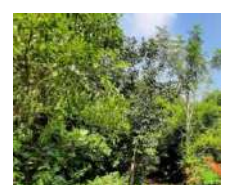
Vikram Sarabhai Memorial Place



Sports Center



Flower Park



Urban Forest

## Amenity Spaces



**1. Riverfront Market**



**2. Exhibition Centre**



**3. Event Ground**



**4. Laundry Campus**

### Objective of the project:

The project aims to provide Ahmedabad with a meaningful waterfront environment along the banks of the Sabarmati river and to redefine an identity of Ahmedabad around the river. The project has reconnected the city with the river and has positively transformed the neglected aspects of the riverfront.



**Environmental  
Improvement**

**Social  
Upliftment**

**Sustainable  
Development**

- Reduction In Erosion And Flood To Safeguard The City Sewage Diversion To Clean The River Water Retention And Recharge.

- Activities created of parks and public spaces provision of socio-cultural amenities for the city.

- Generation of resources, revitalization of neighborhoods. Aims to bring new life to the center of the city.

### Public Concern:

The people of Ahmedabad, by nature are out going people. They want to be in **close vicinity of nature** and a **promenade, biodiversity park** as well as a place to **exercise & spend their leisure time**, provided the respite within the city limits and people around the urban centre.







### 3.2. PATNA RIVERFRONT REVITALISATION, PATNA – BIHAR (BOOK)

- ❖ Architect : Nishant Lall
- ❖ CLIENT : The World Bank/ NMCG / National Mission Of Clean Ganga / Ministry Of Water Resources / BUIDCO/ Bihar Urban
- ❖ Duration : 2015 - 2019
- ❖ Area : 7 Kms
- ❖ Location : Patna, Bihar



A large part of city has turned its back to- wards the Ganges resulting misuse of river edge for dumping and waste accumulation. The traditional Ghats along the river are also dilapidated and so are a large part of govt. land. The scheme plans to integrate these unused land by connecting all the 27 Ghats along the 7km stretch and provide a network of urban parks and walkways to improve access to the Ghats.

#### ❖ Objective of the Project:



ENVIRONMENTAL IMPROVEMENT



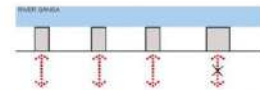
SOCIAL UPLIFTMENT



TO PRESERVE CULTURE OF CITY

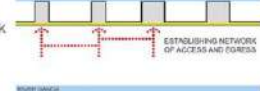
#### EXISTING CONDITION

ISOLATED GHATS  
UNSAFE ZONE/  
BACK OF THE CITY  
GARBAGE DUMPING



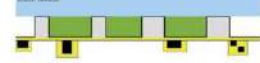
#### PROPOSED URBAN EDGE

7KM LONG NEW URBAN EDGE  
AND STRENGTHENED NETWORK  
CONTINUOUS EDGE



#### PROPOSED FACILITIES

PUBLIC FACILITIES,  
LANDSCAPE ZONES,  
PUBLIC SPACES,  
COMMUNITY BUILDINGS

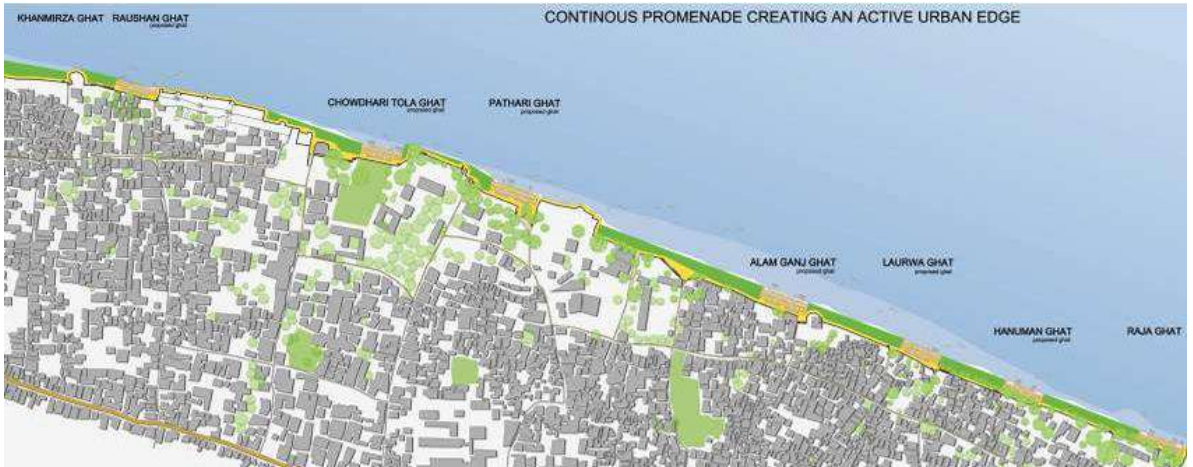


#### Issues:

The urban fabric along edge mostly dating back to around the independence period runs continuously along and upto the river edge thereby leaving very little space for any form of intervention at the river's edge.



❖ Master Plan:



The Promenade And The Ghats Would Form The Transformation Zones Between The River And Edge.



PRECINCT IIIA (GULVI GHAT- GAI GHAT)



20.PATHAR KI MASJID



21.TEKARI HOUSE

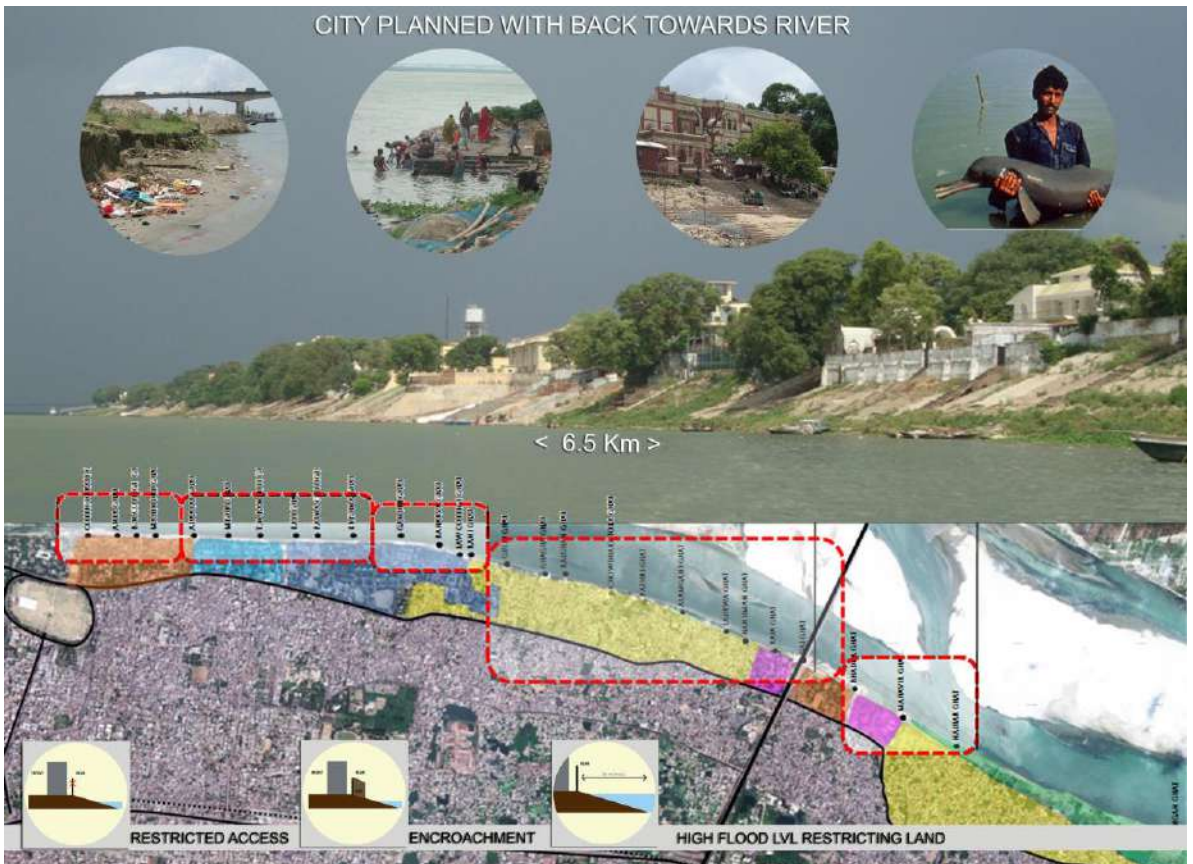


22.BADSHAH NAWABI GIRLS



23.HAVELI MIR ASHRAF





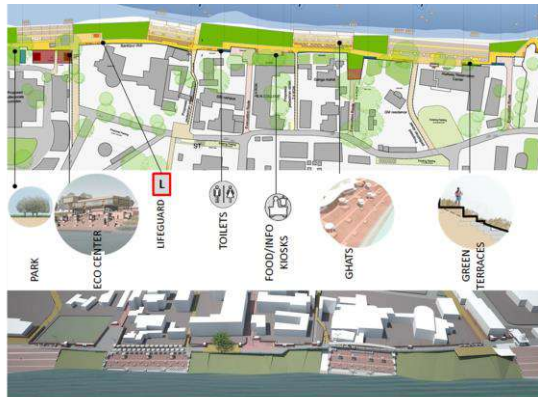
The 6.6 km stretch from Collectorate Ghat to Naujar Ghat in length and in depth between the river edge and the ashok raj path. The precincts in the depth are of various kind of uses ranging from public mixed use, institutional, community and residential.



GHAT



GHAT



PART PLAN OF PATNA RIVERFRONT



GARDEN AND ECO CENTRE



SEATING AREA

The design components would maximize and optimize the space usage available on the river edge. The promenade has been designed to retrofit the existing boundary conditions with ghats and connecting landscape creating access to river wherever possible.

Due to its extent (6.6 km of urban edge), the riverfront project aims to stir up a renewed civic identity and ultimately hopes to nurture a civicmind towards the ganga river.

The built character of patna’s river edge is an expression of surrounding land use, which varies between institutional, residential, and in other cases mixed use. Each of them has come into existence over time and is quite distinct in its morphology.



LANDSCAPED ZONES  
CREATED AT SLOPING  
AREAS OF RIVER EDGE

USABLE PUBLIC  
SPACES CREATED ON  
THE GHATS

PROMENADE SPACE  
CONNECTING ONE  
GHAT TO THE OTHER



USABLE PUBLIC  
SPACES CREATED ON  
THE GHATS

PROMENADE SPACE  
CONNECTING ONE  
GHAT TO THE OTHER

LANDSCAPED ZONES  
CREATED AT  
SLOPING AREAS OF  
RIVER EDGE

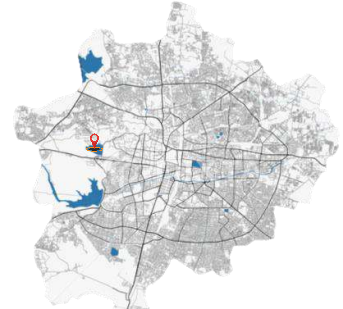


### Inferences:

- Integrate green infrastructure, such as wetlands, parks, and greenways, to promote biodiversity and mitigate flood risks.
- Foster a mix of residential, commercial, cultural, and recreational activities along the riverfront to create a dynamic and inclusive urban environment.
- Preserve and celebrate the historical heritage of the riverfront through adaptive reuse of heritage buildings, public art installations, and interpretive signage.
- Activate the riverfront with a diverse mix of amenities such as promenades, waterfront cafes, markets, performance spaces, and recreational facilities promotes community engagement.

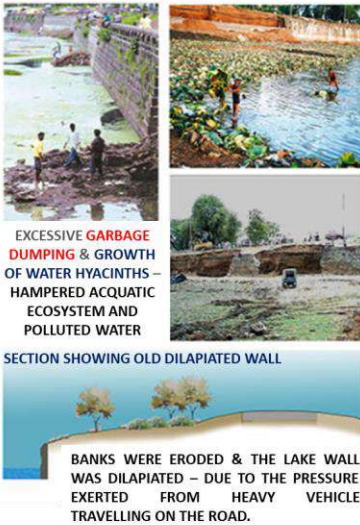
### 3.3. WATERFRONT DEVELOPMENT AT FUTALA / TELANKHEDI LAKE, NAGPUR – MAHARASHTRA (LIVE)

- ❖ Architecture Firm : Deeproots Design
- ❖ Client : Nagpur Improvement Trust
- ❖ Area : 4 Acres
- ❖ Budget : 1 Crore
- ❖ Duration : 3 Years
- ❖ Project Brief : To Improve Waterfront Of Futala Lake
- ❖ Location : Nagpur, Maharashtra



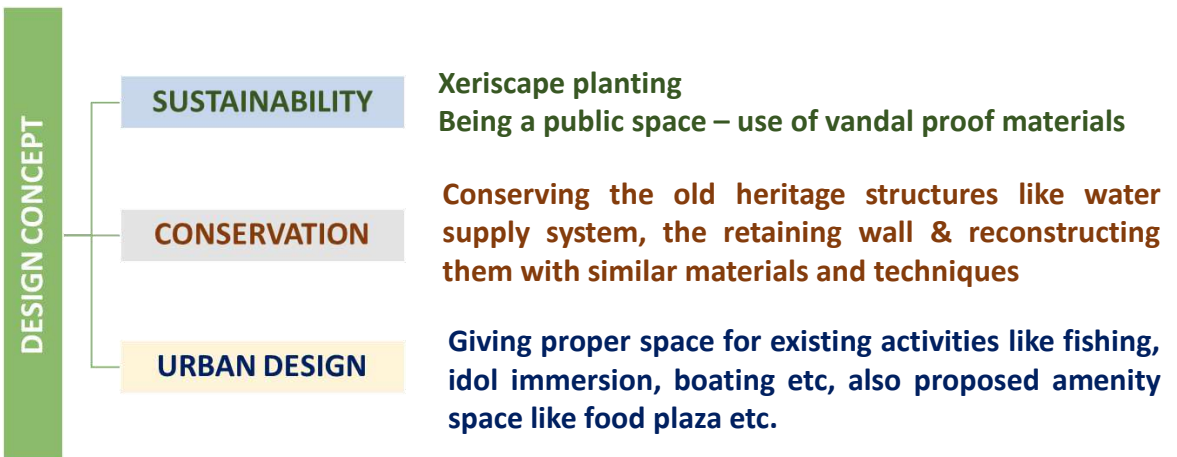
Built by 2<sup>nd</sup> Raghuji Raje Bhosale in 1783. Originally the embankments were constructed in the last century by Raje Bhosale in an attempt to conserve the water body. Was created to serve as additional sources of water to segment water supply.

#### ISSUES AND CONCERNS :



**SITTING WAS A MAJOR PROBLEM DUE TO IDOL IMMERSION WHICH REDUCED WATER HOLDING CAPACITY OF THE LAKE .**

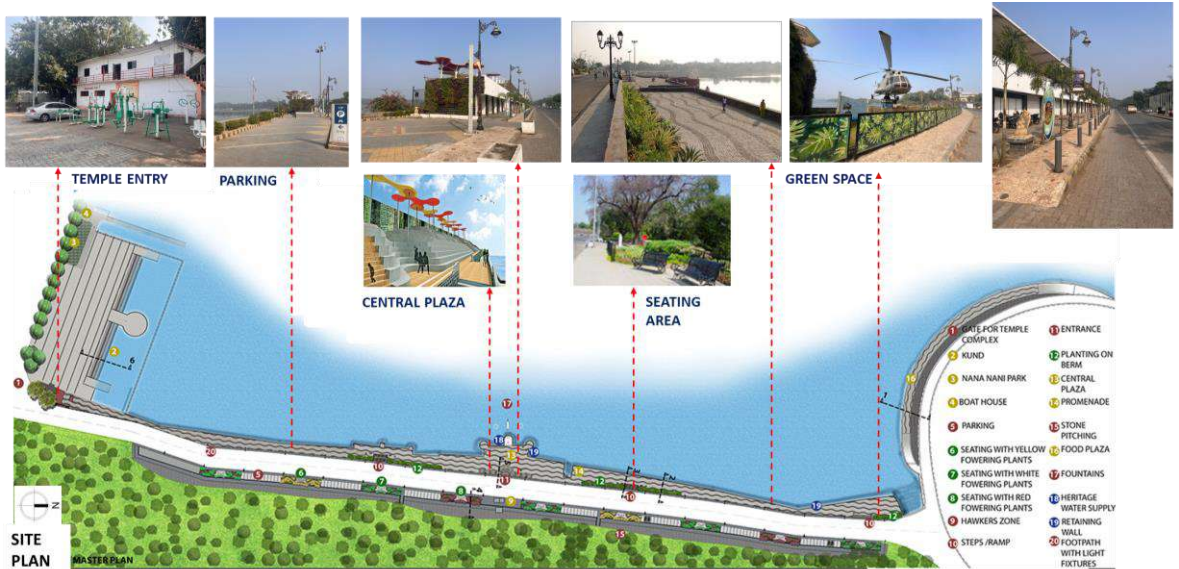
#### ❖ Concept:



❖ Site and Surrounding:



❖ Master Plan:

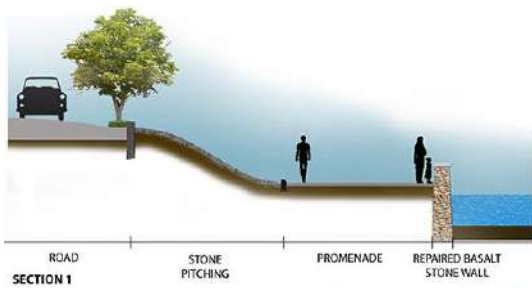


**SITTING AREA**



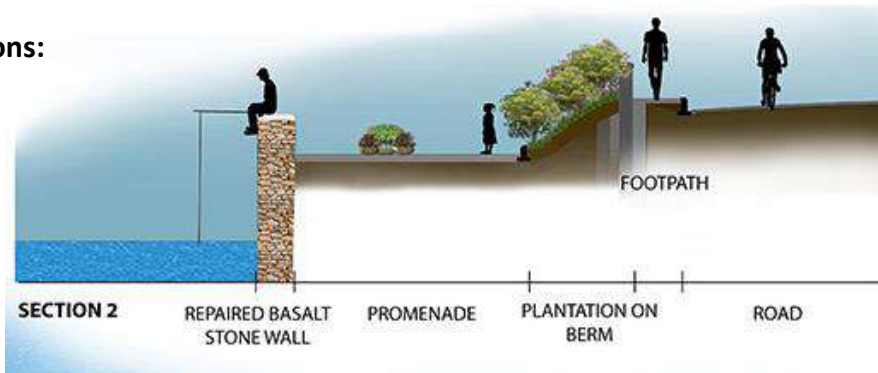
**FOOD COURT**

❖ Sections:

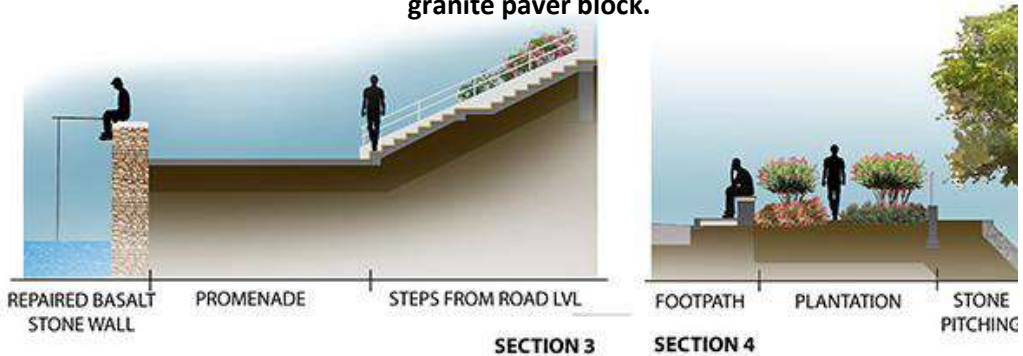


Lake walls are conserved using same construction technique with which it is built before.

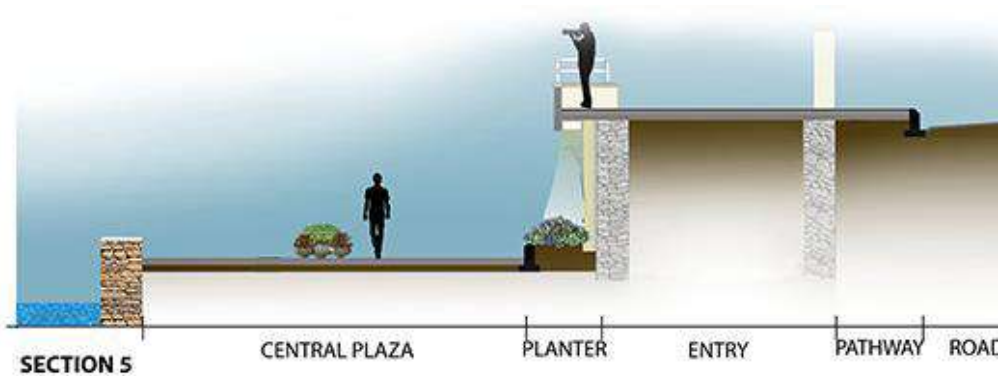
❖ **Sections:**



The design is achieved by using locally available materials such as basalt stone, granite paver block.



Drip irrigation and sprinkler irrigation is used to water plants.



Storm water drainage is taken care by introducing weepholes at regular intervals.

**Inferences:**

The lake's design takes advantage of its natural surroundings, providing A serene and picturesque setting for visitors.

The lake is designed with a central island garden, fountains, and promenades along the shoreline. The design elements blend in seamlessly with the natural landscape, offering A harmonious blend of architecture and nature.

Promotes community engagement through recreational facilities: the design includes facilities for boating, paddle boating, and other water-based activities, as well as leisure areas for picnics and relaxation.

Environmental sustainability: the design inference of futala lake also includes elements of environmental sustainability, such as water conservation measures, eco-friendly landscaping practices, and efforts to preserve the natural ecosystem of the area.

### 3.4. Comparative Analysis of Waterfront Development

CASE STUDIES -	WATERFRONT DEVELOPMENT		
	SABARAMATI RIVERFRONT DEVELOPMENT	PATNA RIVERFRONT REVITALISATION	WATERFRONT DEVELOPMENT AT FUTALA
ARCHITECT	DR. BIMAL PATEL	NISHNAT LAL	DEEPROOTS DESIGN
LOCATION SITE AREA	AHMEDABAD, GUJARAT  SITE AREA = 506 ACRES	PATNA, BIHAR  SITE AREA = 7 KMS	NAGPUR, MAHARASHTRA  SITE AREA = 4 ACRES
CLIMATE	TEMPERATE	TEMPERATE	COMPOSITE
ORIENTATION AXIS BUILDING ENTRANCE	NORTH – SOUTH  EAST & WEST	EAST – WEST  SOUTH OF THE GHAT	NORTH – SOUTH  EAST
PLANNING	The Sabarmati Riverfront's planning drew inspiration from <b>global riverfront developments</b> , aiming to <b>transform the riverbanks into vibrant public spaces</b> .	To create a <b>permanent edge, Promenade</b> connecting various isolated Ghats and to provide <b>variety of access to the river</b>	The planning inspiration for Futala Waterfront in Nagpur drew from modern urban design principles, aiming for <b>sustainable development and community engagement</b> .
CONCEPT	The concept is to reconnect the city with the river with the help of <b>Environmental Improvement, Social Up-liftment &amp; Sustainable Development</b>	The concept is to <b>rejuvenate Ghats along the river and to integrate flood mitigation, urban revitalization, public spaces, and cultural heritage preservation along the riverbanks</b> .	<b>Conserving the old heritage structures</b> like water supply system, the retaining wall & reconstructing.
CLIMATE COMPATIBILITY / SUSTAINABILITY	Sabarmati Riverfront incorporates green spaces, water bodies, and shade structures to mitigate urban heat island effect, enhance biodiversity, and promote passive cooling strategies.	Patna Riverfront utilize green infrastructure, water management systems, and vegetation to mitigate flooding, improve air quality, and enhance urban resilience.	Futala Waterfront in Nagpur integrate sustainable landscaping, storm water management, and shade provision to mitigate heat, enhance biodiversity, and promote public comfort.
LIGHTING & VENTILATION	The street lights used are solar lights.	The street lights used are solar lights.	The street lights used are solar lights.

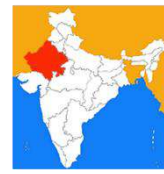


<b>LIFT</b>	-	-	-
<b>RAMP</b>	YES	YES	YES
<b>COURTYARD</b>	-	-	-
<b>STRUCTURAL SYSTEM</b>	<p>The <b>stepped ghats</b> are provided with the <b>alternate areas of landscape and vegetated buffers</b> to <b>mitigate flood</b>.</p> <p>The lower promenade is to serve pedestrian activities and to provide access t water, the upper level promenade host the variety of public features at city level.</p>	<p>The <b>promenade</b> has been designed to <b>retrofit the existing boundary conditions</b> with Ghats and creating sloped landscape as vegetated buffer to <b>mitigate flood</b>.</p>	<p>Lake walls are conserved using <b>same construction technique</b> with which it is built before. The design is achieved by using locally available materials such as <b>Basalt Stone, Granite Paver Block</b>.</p> <p>Storm water drainage is taken care by introducing <b>weepholes</b> at regular intervals.</p>
<b>STAKEHOLDERS</b>	<ul style="list-style-type: none"> <li>▪ Government of Gujarat</li> <li>▪ Local administration</li> <li>▪ Businessman</li> <li>▪ Visitors &amp; tourists</li> <li>▪ Local Community</li> <li>▪ Funding agencies and Donors</li> <li>▪ Academic and Educational Institutions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Government of Bihar</li> <li>▪ Local administration</li> <li>▪ Businessman</li> <li>▪ Visitors &amp; tourists</li> <li>▪ Local Community</li> <li>▪ Funding agencies and Donors</li> <li>▪ Academic and Educational Institutions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Government of Maharashtra</li> <li>▪ Local administration</li> <li>▪ Businessman</li> <li>▪ Visitors &amp; tourists</li> <li>▪ Local Community</li> <li>▪ Funding agencies and Donors</li> <li>▪ Academic and Educational Institutions</li> </ul>
<b>INFERENCE VIEWS AND OBSERVATION AS CRITIC</b>	<p>Public edge : the riverfront project creates a public edge along the river on the eastern and western banks.</p> <p>Improved access : to better access the riverfront and facilities built along streets to welcome the public and visitor also the new streets are designed with wide footpaths and designated cycle tracks to improve and encourage pedestrian access to the river.</p>	<p>Integrate green infrastructure, such as wetlands, parks, and greenways, to promote biodiversity and mitigate flood risks.</p> <p>Foster a mix of residential, commercial, cultural, and recreational activities along the riverfront to create a dynamic and inclusive urban environment.</p>	<p>The lake's design takes advantage of its natural surroundings, providing a serene and picturesque setting for visitors.</p> <p>The lake is designed with a central island garden, fountains, and promenades along the shoreline. The design elements blend in seamlessly with the natural landscape, offering a harmonious blend of architecture and nature.</p>

<p><b>INFERENCE VIEWS AND OBSERVATION AS CRITIC</b></p>	<p>Social up-liftment : many new parks, gardens and sports facilities are being built on the reclaimed land to enhance livability in the area that they are located in and strengthen the city's green network.</p> <p>Self financing : he project aims to be self-financing – to achieve its goals without relying on any funding from the government.</p> <p>Amenity sections : continuous promenade at water edge, Ghats punctuate lower level promenades at planned interval to provide access to the water, boating station at lower level ensures water recreation.</p> <p>More part of the riverfront contributes to built spaces when compared to unbuilt and green open spaces contributing in environmental degradation.</p>	<p>Preserve and celebrate the historical heritage of the riverfront through adaptive reuse of heritage buildings, public art installations, and interpretive signage.</p> <p>Activate the riverfront with a diverse mix of amenities such as promenades, waterfront cafes, markets, performance spaces, and recreational facilities promotes community engagement.</p>	<p>Promotes community engagement through recreational facilities: the design includes facilities for boating, paddle boating, and other water-based activities, as well as leisure areas for picnics and relaxation.</p> <p>Environmental sustainability: the design inference of Futala lake also includes elements of environmental sustainability, such as water conservation measures, eco-friendly landscaping practices, and efforts to preserve the natural ecosystem of the area.</p>
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### 3.5. JAWAHAR KALA KENDRA, JAIPUR – RAJASTHAN (BOOK)

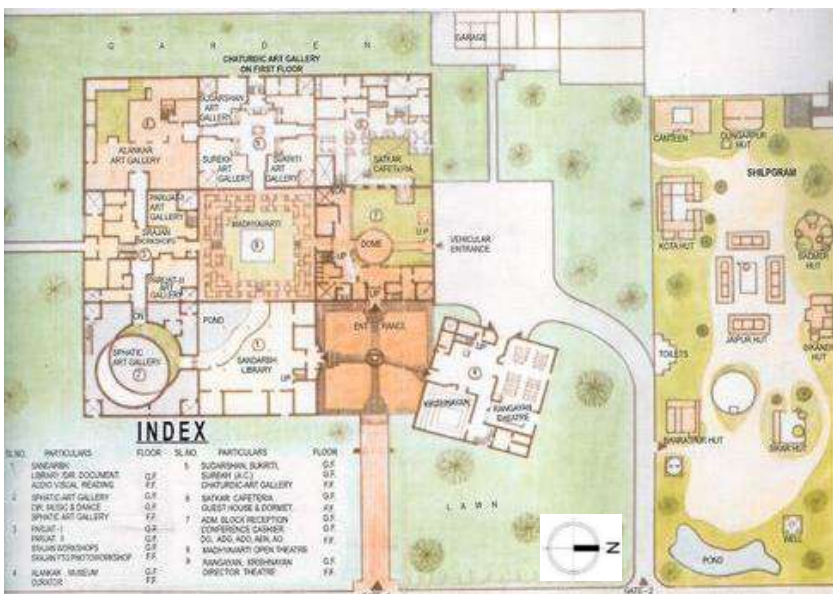
- ❖ Architects: Charles Correa Associates
- ❖ Location: Jaipur, Rajasthan, India
- ❖ Client: Government Of Rajasthan
- ❖ Built-up Area: 9.5 Acres
- ❖ Construction: 5 Years (1986 – 1991)
- ❖ Typology: Cultural Architecture / Museum
- ❖ Project Year: 1991



#### ❖ Site And Surroundings



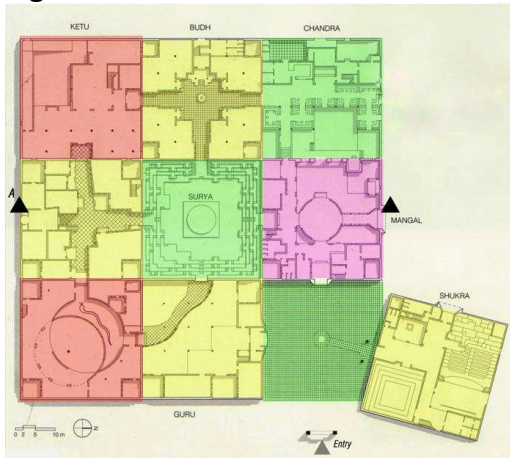
#### ❖ Site Planning



The architectural plan of the center is an inspiration of the original city plan of Jaipur which was conceived by maharaja Jai Singh.

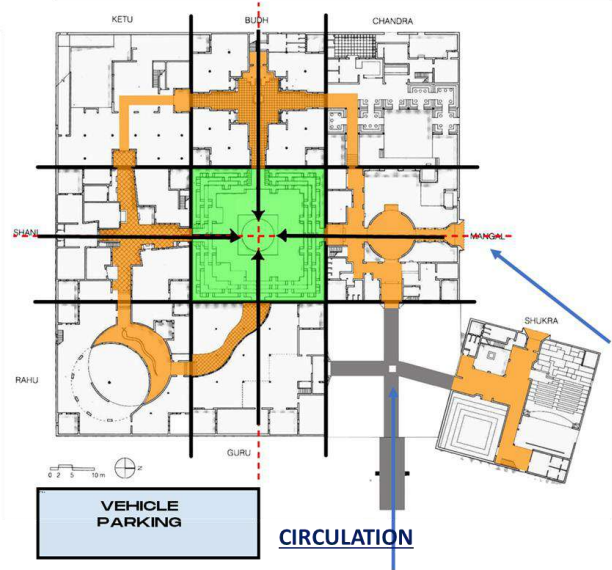
The concept of nine squares or the 'Navagraha Mandala' forms as the fundamental principle in the planning and allocation of spaces, function, and character of the kala Kendra.

## ❖ Zoning and Circulation



### ZONING

- SPACES OF LEARNING
- ADMINISTRATION
- MUSEUM / GALLERY SPACES
- RECREATIONAL SPACES



### CIRCULATION

- INTERNAL CIRCULATION
- EXTERNAL CIRCULATION
- VEHICULAR ACCESS
- PUBLIC ACCESS

## ❖ Built and Un-Built Areas

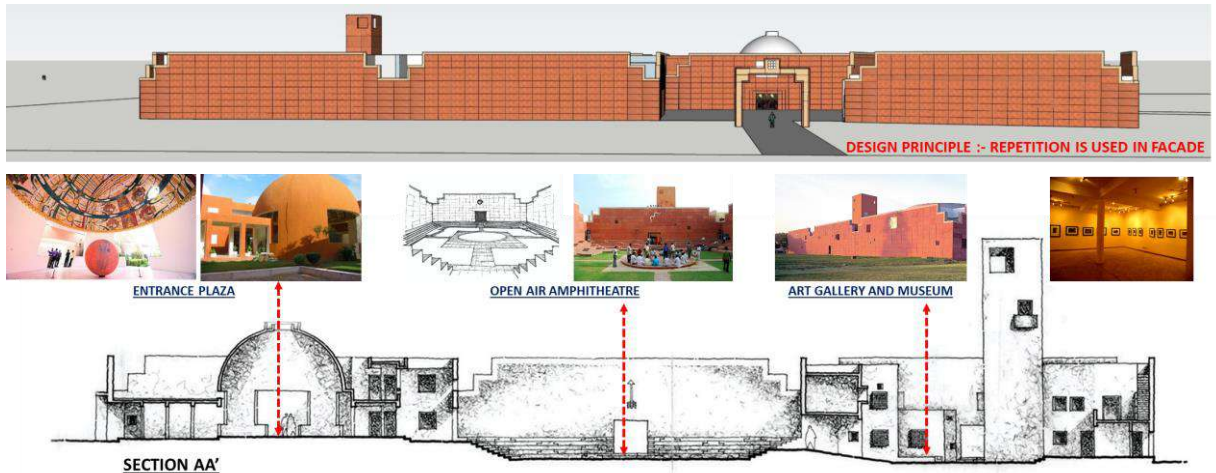


Fragmented spaces of built, un-built and the in-between are configured to create numerous journeys within the building.

The building allows the users to experience a non-linear, almost arbitrary movement throughout the discovery of the premises ; much like how one traverses within the old city of Jaipur.

Here, the architect ensures a sensorial experience of the user as the eyes move along sharp lines of the shadows while the built volumes conjure up the sound, creating soft echoes that fade through the spaces.

## ❖ Sections and Elevations:



- Different plinth levels are can also be noticed, major level change can be seen in the open theatre .
- Different sizes and shapes of components have been used in the structure making it more complex, elegant and aesthetic.
- During the sunrise and dawn hours, high raised walls provide shading to the open theatre and the adjacent pathways.

### MADHYAVARTI OPEN AIR THEATRE

- It is planned such that the rest of the 8 square were well connected to the central open theatre.
- Stepped platform for seating purpose
- The same was surrounded by the 8m high walls and the design of steps was incorporated in the corner of the two walls as the top periphery of the wall was lined with marble.
- Motifs of each planet was indicated on 3 respective walls.
- Most of the occasions & functions (music & dance) are conducted in this central space.



### Climate Responsive Building

- Material :- Red Stone & White Marble
- Small Puncture On Wall For Ventilation
- Lift Shafts Have Step Profile With Marble Capping
- Lift Shafts At Corner Of Each Unit
- Central Courtyard Bring In Light And Air



- The significant feature which has been adopted in this - was the spectacular play with the light and the shadow.
- Light shafts at corner of each unit is provided
- Light shafts have step profiles with marble capping
- Small punctures on walls for ventilation (smaller openings)

### 3.6. SHIVSRUSHTI – HISTORICAL MUSEUM, PUNE – MAHARASHTRA (LIVE)

- ❖ Owner : Maharaja Shivchatrapati Pratishthan
- ❖ Architecture Firm : Crystal Arch
- ❖ Plot Area : 81200 Sqm
- ❖ Built Up Area : 40473.95 Sqm
- ❖ No. Of Floors : G + 2
- ❖ Location – Pune, Maharashtra



#### ❖ Site and Surrounding:



SINHGAD CAMPUS



BHARATI VIDYAPEETH  
DEEMED TO BE UNIVERSITY



FLYING PANDA –  
TRAMPOLINE PARK



RAJIV GANDHI ZOOLOGICAL PARK

#### ❖ Design Concept & Inspiration

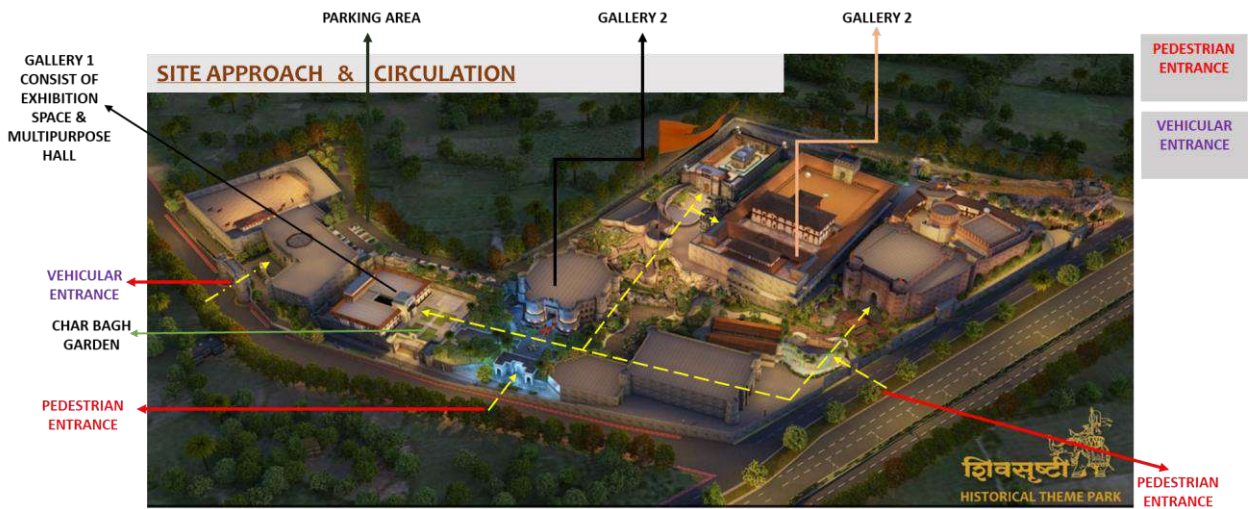


Shivrushti is a dream that took shape under auspices of **Padma Vibhushan Maharashtra Bhushan Shivshahir Babasaheb Purandare**.

The main theme of the project is to **recreate the bygone era** in its full grandeur commonly known as the **Shiv-kaal**. Hence the name **Shivrushti**.

The theme park is designed like a collage of the **16th and 17th century maratha culture** mainly revolving around the lifetimes of **Chhatrapati Shivaji Maharaj** and the concept of **Hindavi Swarajya**.

## ❖ Site Approach and Circulation



THIS THEME IS SHOWCASED THROUGH THE HISTORICAL LANDSCAPE DEPICTING THAT ERA AND BUILT FORMS SUCH AS FORTS, SHRINES, BAZARPETH, VILLAGE SCENES, AND STREET FURNITURE ELEMENTS LIKE DEEPMAL, STEP WELLS, CHAVDIS, ETC.

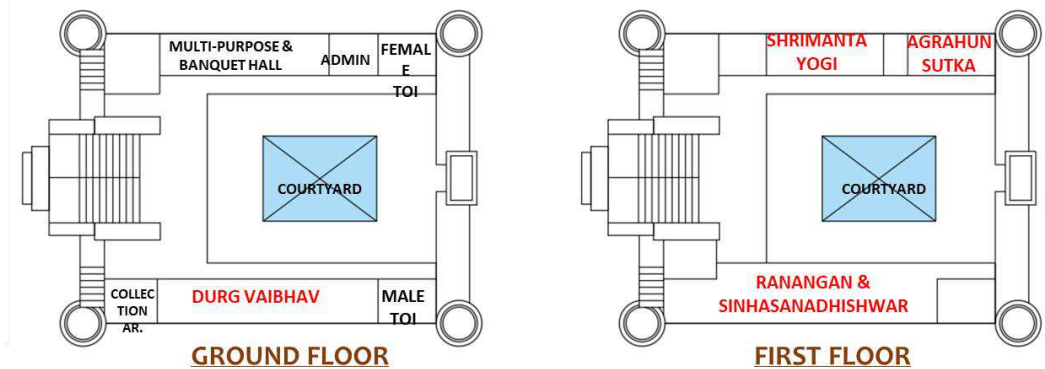


Picture From Outside

Maratha Style Architecture - High Plith Level & Fortification Walls – To Create Welcoming Environment

Courtyard

## ❖ Plan and Sectional Elevation

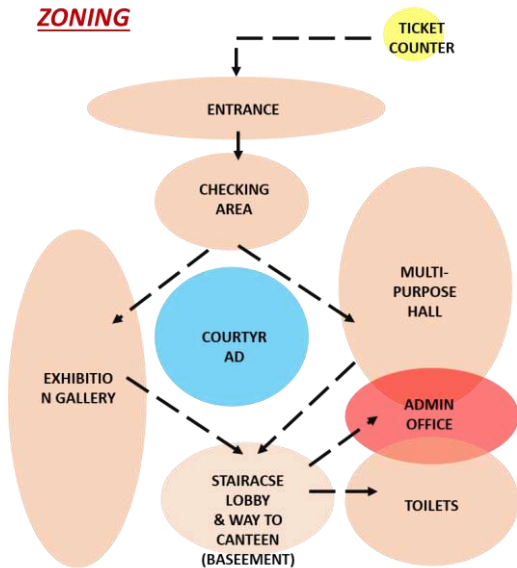


FLOOR PLANS



SECTIONAL ELEVATION

**ZONING**



**EXHIBITION GALLERY**



USE OF PROJECTORS TO SHOW THE FORTS AND BATTLES THEY FOUGHT AND THEIR HISTORY.



SINHASANADHISHWAR - GALLERY



MULTI - PURPOSE HALL



**AIM:**



- OLD BUILDING ELEMENTS AND FEATURES WERE USED TO PRESERVE CULTURAL HERITAGE OF THE CITY



- LINEAR CIRCULATION IS MAKING THE PLACE MORE USER FRIENDLY.

- MINIMUM COLORS HAS BEEN USED INTERNALLY TO HIGHLIGHT ART-WORKS.

- NO PARKING HAS BEEN PROVIDED.

**VISION:**

TRANSCENDS BEYOND THE MATERIALISM OF AN ARCHITECTURAL HERITAGE PROJECT



PROPAGATED THROUGH VARIOUS CULTURAL ACTIVITIES NAMEDLY WORKSHOPS AND HERITAGE WALKS TO IMBIBE THE HISTORICAL LEGACY OF THE LAND



TO EXPLORE CREATIVITY & HISTORY TO CONNECT SPECTATORS TO THEIR CULTURAL ROOTS .

PRESERVE OUR RELIGIOUS, CULTURAL AND HISTORICAL VALUE.



THEY ARE A GOOD SOURCE OF KNOWLEDGE & ENTERTAINMENT AS WELL.



THIS PLACE IS POSITIONED AS CREATIVITY & AMENITY CENTRE - MUSEUM WITH OTHER FACILITIES FOR DISCOVERY, LEARNING, RECREATIONAL & CELEBRATION SPACE.

**EXHIBITION GALLERIES : VASTU SANGRAHALAYA :- NAMED AS - SHRIMANTA YOGI, AGRAHUN SUTKA, SINHASANADHISHWAR, RANANGAN, DURGAVAIBHAV**

**MULTI-PURPOSE HALL - DURBAR HALL**

**LIBRARY - VACHANALAYA**

**CANTEEN - UPHAAR GRIHA**

**ADMIN OFFICE - DAFTAR / KACHERI**

**CONFERENCE ROOM - KHALABAT KHANA**



**NEED:**

**SPACES:**



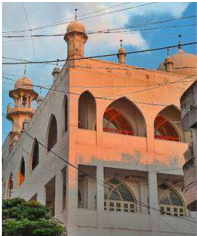
### 3.7. SACHEE ART GALLERY, NAGPUR – MAHARASHTRA (LIVE)



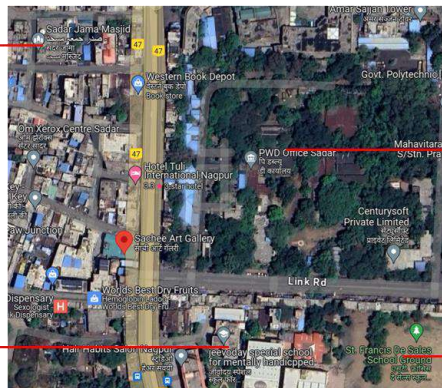
- ❖ Owner : Parmesh Pandhi
- ❖ Built Up Area : 200 Sqm
- ❖ Type : Exhibition Building (Adaptive Reuse)
- ❖ The Two Floored Heritage Building Houses Artworks Of Various Renowned Artists.
- ❖ Location : Nagpur, Maharashtra



#### ❖ Site and Surroundings



SADAR JAMA MASJID



PWD OFFICE



JEEVANODAY SPECIAL SCHOOL



ST. FRANCIS SCHOOL

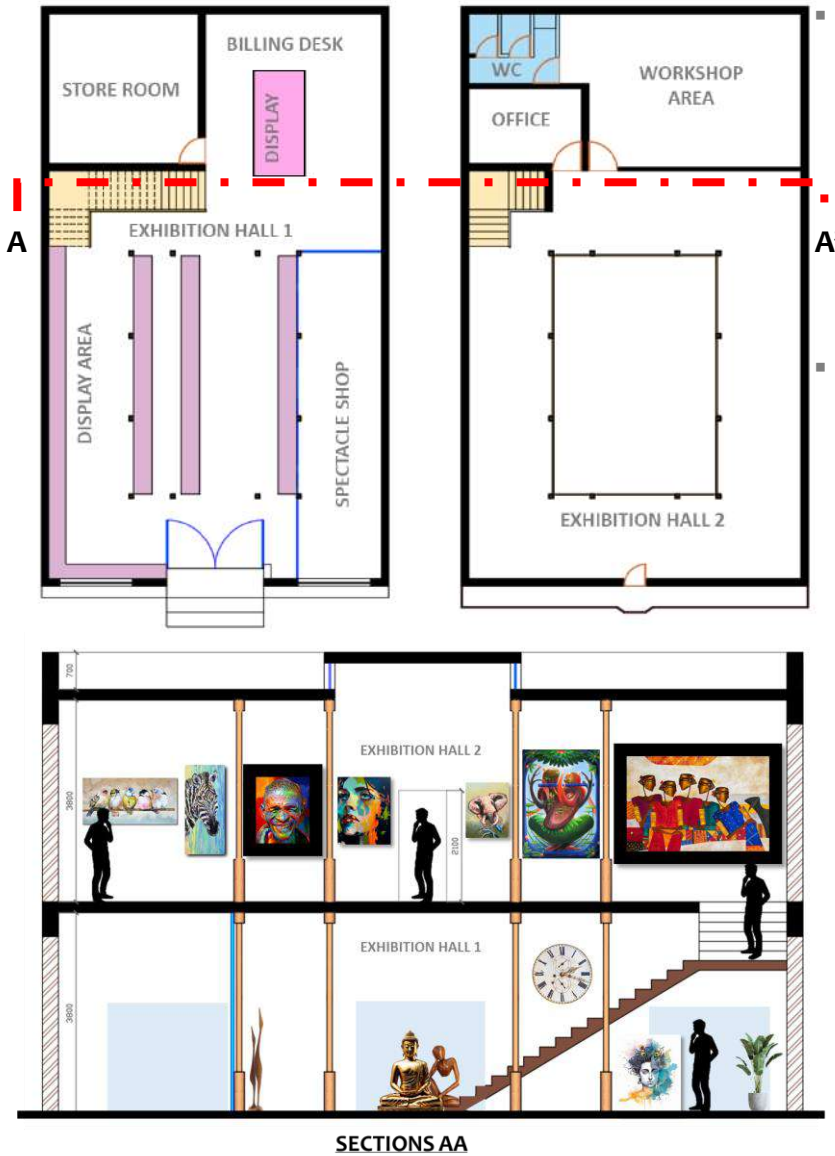
- This art gallery is situated in the market, posh business and commercial locality.
- It is a prime location and has tremendous business, which includes starred hotels, restaurants and shopping arcades.
- Most of the precinct area is characterized by a high degree of congestion and narrow roads, posing significant challenges for both pedestrians and vehicular traffic.

#### ❖ Concept



To transform the old building into an art gallery, breathing new life into its historic walls and creating a dynamic space for creativity and cultural expression.

## ❖ Plan and Section



The Sachee art gallery is housed in a spacious, elegant and heritage building that provides a perfect setting for showcasing contemporary art, also preserving city's cultural heritage.

The gallery has 2 exhibition halls, each with its unique theme and style, showcasing the works of established and emerging artists.



Exhibition Space

### Inferences:

- Old building elements and features were used to preserve cultural heritage of the city
- Linear circulation is making the place more user friendly.
- Minimum colors has been used internally to highlight art-works.
- No parking has been provided.

### 3.8 Comparative Analysis of Exhibition Spaces

CASE STUDIES -	EXHIBITION SPACES		
	JAWAHAR KALA KENDRA	SHIV-SRUSHTI HISTORICAL MUSEUM	SACHEE ART GALLERY
ARCHITECT	CHARLES CORREA	CRYSTAL ARCH	PARMESH PANDHI
LOCATION	JAIPUR, RAJASTHAN	PUNE, MAHARASHTRA	NAGPUR, MAHARASHTRA
SITE AREA	SITE AREA = 9.5 ACRES	SITE AREA = 81200 SQM	SITE AREA = 200 SQM
CLIMATE	HOT & HUMID	WARM & HUMID	COMPOSITE
ORIENTATION AXIS	NORTH – EAST	EAST – WEST	EAST – WEST
BUILDING ENTRANCE	EAST	SOUTH-WEST & WEST	EAST
PLANNING	Planning inspiration is taken from the <b>city plan</b> and developed with the help of 9 planets.	The theme park is designed like a <b>collage of the 16th and 17th century Maratha culture</b> mainly revolving around the lifetimes of <b>Chhatrapati Shivaji Maharaj</b> and the <b>concept of Hindavi Swarajya</b> .	The planning inspiration is taken from <b>re-adaptive use</b> of building in a creative way.
CONCEPT	The concept of nine squares or the <b>‘Navagraha Mandala’</b> forms as the fundamental principle in the planning and allocation of spaces, function, and character of the Kala Kendra.	The main theme of the project is to <b>recreate the bygone era</b> in its full grandeur commonly known as the <b>Shiv-Kaal</b> . Hence the name Shivrushti.	To transform the <b>old building into an art gallery, breathing new life into its historic walls</b> and creating a dynamic space for creativity and cultural expression.
CLIMATE COMPATIBILITY / SUSTAINABILITY	The heat and harshness of the climate are not felt due to the 8m high compound wall and courtyards.	Shivrushti Museum incorporates passive design like courtyards, evaporative cooling, and indigenous landscaping to minimize environmental impact, conserve resources, and enhance visitor comfort.	The building feature thick walls, courtyards for ventilation, and sloping roofs to provide thermal comfort, natural cooling, and protection from harsh climates.

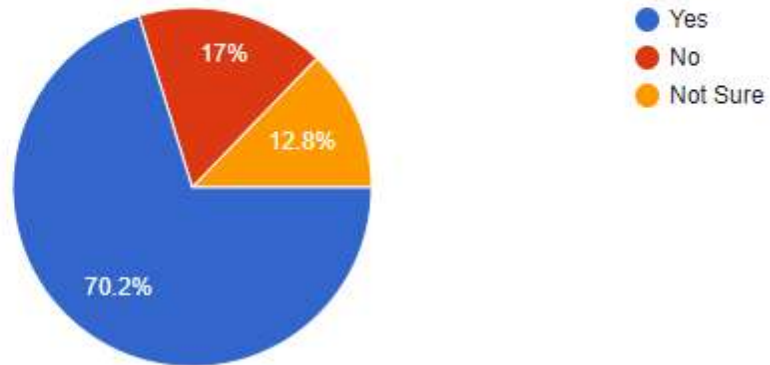
<b>LIGHTING &amp; VENTILATION</b>	Artificial lights such as spotlights, track lighting, and ambient lighting, used strategically to accentuate specific objects, highlight textures, and create focal points within gallery spaces. Also light and ventilation through light shafts and small openings.	Artificial lights such as spotlights, track lighting, and ambient lighting, used strategically to accentuate specific objects, highlight textures, and create focal points within gallery spaces.  Mechanical ventilation	Artificial lights such as spotlights, track lighting, and ambient lighting, used strategically to accentuate specific objects, highlight textures, and create focal points within gallery spaces.  Mechanical ventilation
<b>LIFT</b>	NO	NO	NO
<b>RAMP</b>	NO	NO	NO
<b>COURTYARD</b>	YES	YES	YES
<b>STRUCTURAL SYSTEM</b>	The spanning between the beams was designed so that the local materials like Wooden Bamboo Sticks could be used to complete the Entrance Space Frame.	The structural system of the building reflects the traditional building techniques, cultural values, and environmental considerations of the region in which it is built. The walls are constructed of stone.	The walls were constructed of stone (load-bearing walls). The planning based on a <b>Square Grid Pattern</b> with wooden slab and wooden structural members like <b>wooden columns</b> to support the structure.
<b>STAKEHOLDERS</b>	<ul style="list-style-type: none"> <li>▪ Government of Rajasthan</li> <li>▪ Department of Art and Culture, Government of Rajasthan</li> <li>▪ Artists and Cultural Practitioners</li> <li>▪ Jawahar Kala Kendra Management Committee</li> <li>▪ Local administration</li> <li>▪ Local Community</li> <li>▪ Funding agencies and Donors</li> <li>▪ Academic and Educational Institutions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Government of Maharashtra</li> <li>▪ Department of Art and Culture, Government of Maharashtra</li> <li>▪ Artists and Cultural Practitioners</li> <li>▪ Shivrushti Management Committee</li> <li>▪ Local administration</li> <li>▪ Visitors &amp; tourists</li> <li>▪ Local Community</li> <li>▪ Funding agencies and Donors</li> <li>▪ Academic and Educational Institutions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Department of Art and Culture, Government of Maharashtra</li> <li>▪ Artists and Cultural Practitioners</li> <li>▪ Sachee Art Gallery Management Committee</li> <li>▪ Visitors &amp; tourists</li> <li>▪ Local Community</li> <li>▪ Funding agencies and Donors</li> <li>▪ Academic and Educational Institutions</li> </ul>

<p><b>INFERENCE VIEWS AND OBSERVATION AS CRITIC</b></p>	<p>The critical sustainable aspect of traditional architecture of Jaipur has been tracked well, as the are open spaces in the central part of the building.</p> <p>Play of light , shadow and color , evoke emotions in the user making him move around.</p> <p>The punctures on the external façade provides good ventilation keeping the fact in mind that, there are no openings on the façade.</p> <p>Climate responsive architecture to create a comfortable interior while reducing the building's reliance on artificial energy.</p>	<p>Transcends beyond the materialism of an architectural heritage project</p> <p>Propagated through various cultural activities namely workshops and heritage walks to imbibe the historical legacy of the land</p> <p>Explore creativity &amp; history to connect spectators to their cultural roots .</p> <p>This place id positioned as creativity &amp; amenity center - museum with other facilities for discovery, learning, recreational &amp; celebration space.</p>	<p>Old building elements and features were used to preserve cultural heritage of the city</p> <p>Linear circulation is making the place more user friendly.</p> <p>Minimum colors has been used internally to highlight art-works.</p> <p>No parking has been provided.</p>
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## CHAPTER 4 – SURVEY (QUESTIONNAIRE)

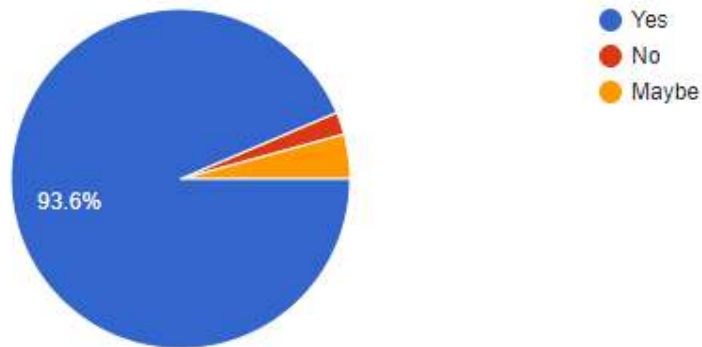
Do you know what is riverfront Development? If yes, have you visited one?

47 responses



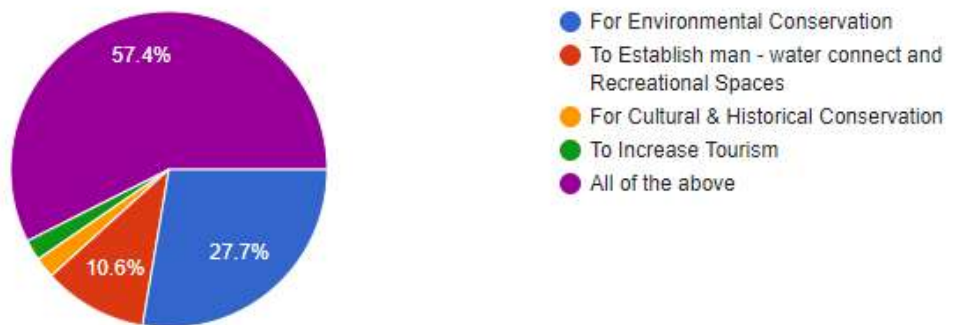
Do you think that the edges of Nag River of Nagpur, Maharashtra needs a Riverfront development?

47 responses



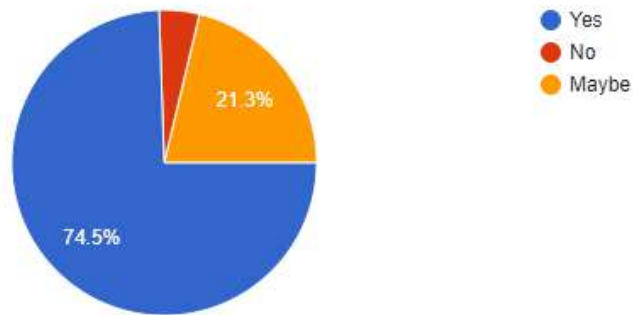
Why do you think the Riverfront Development is necessary in Nagpur?

47 responses



### Do you think Riverfront Development will contribute to Economic Growth of Nagpur?

47 responses



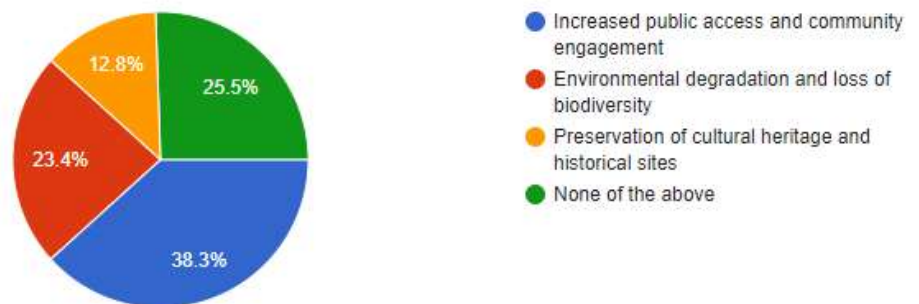
### How do you think riverfront development projects can contribute to the overall ecological health of a region?

47 responses



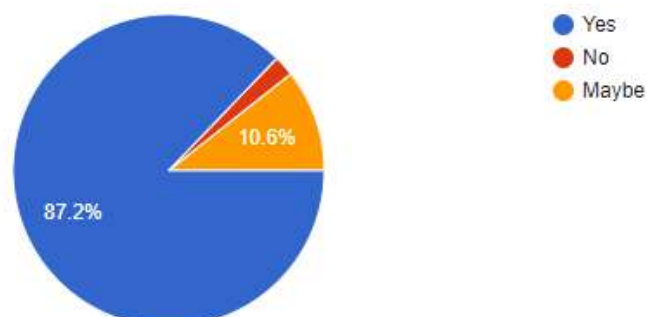
### What potential challenges might arise during the implementation of riverfront development initiatives in Nagpur?

47 responses



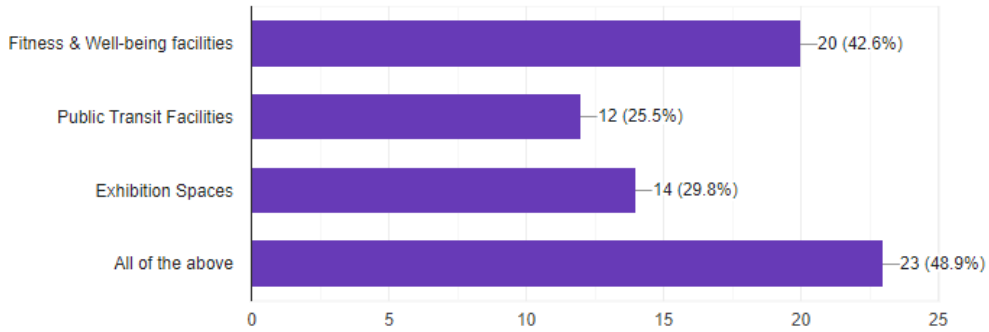
### Do you think that there is a need of Amenity Centre in Nagpur, Maharashtra?

47 responses



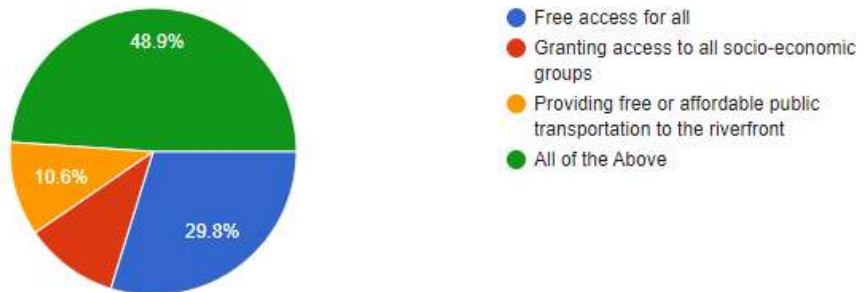
What all facilities do you need in amenity center?

47 responses



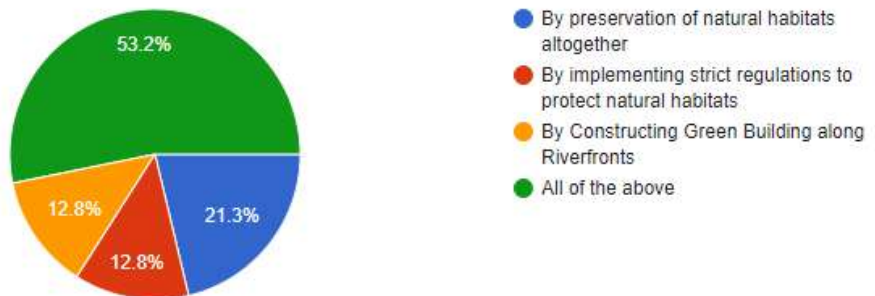
What strategies do you believe are effective in ensuring equitable access to riverfront and amenity spaces for all community members?

47 responses



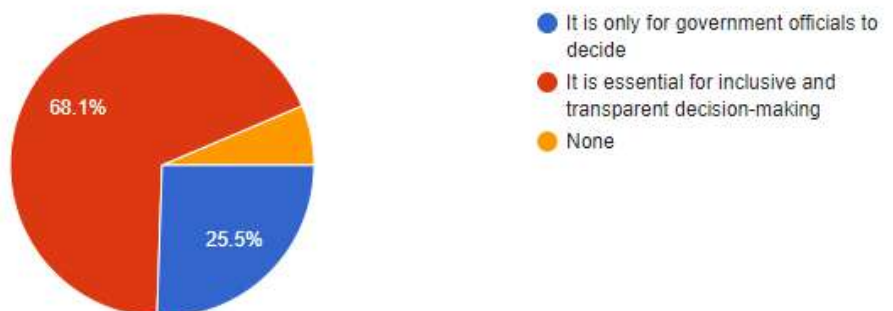
How do you envision balancing the need for urban development with the preservation of natural habitats along riverfronts?

47 responses



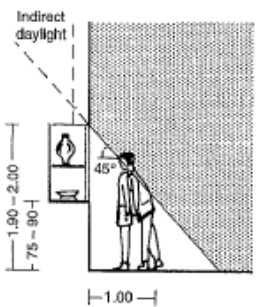
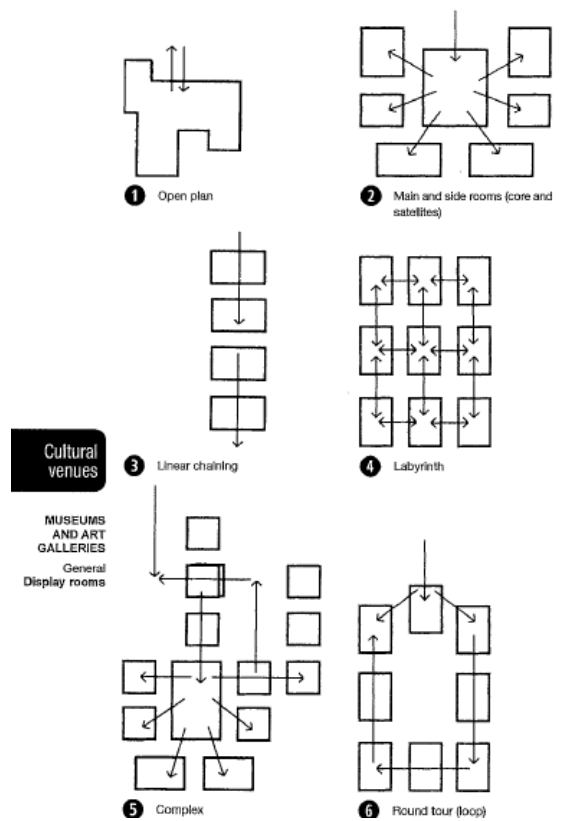
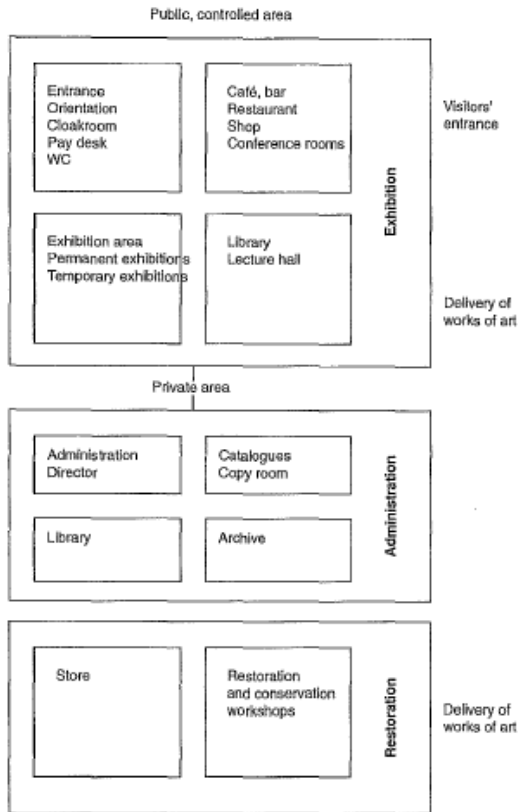
What is the role of public participation in planning of an Amenity Centre in Nagpur?

47 responses

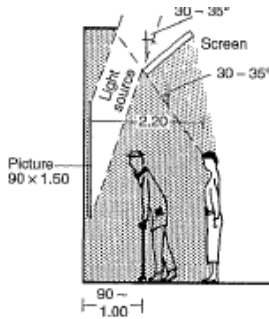




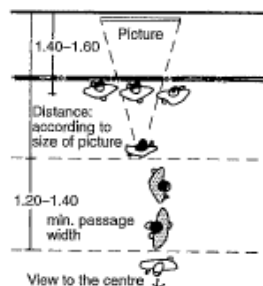
## 5.1. Art Gallery



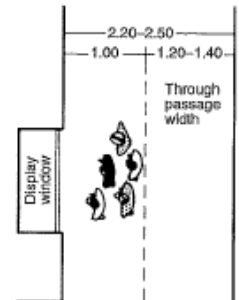
**7** Light and shadow in display cabinets



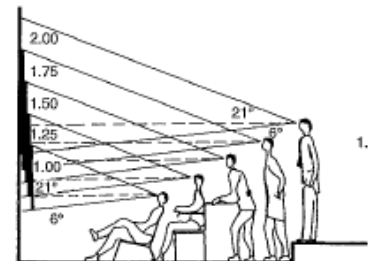
**8** Distance and light



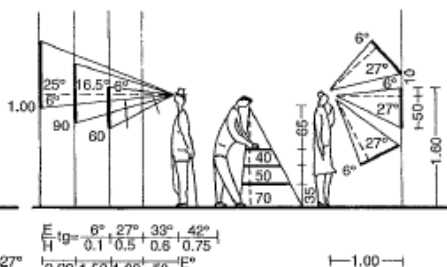
**9** Pictures on the wall: viewing and traffic



**10** Space in front of display cabinet

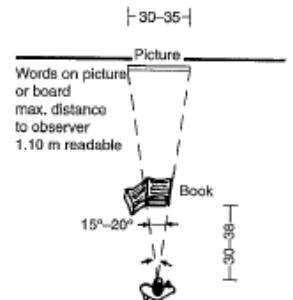


**11** Field of view: height, size and distance



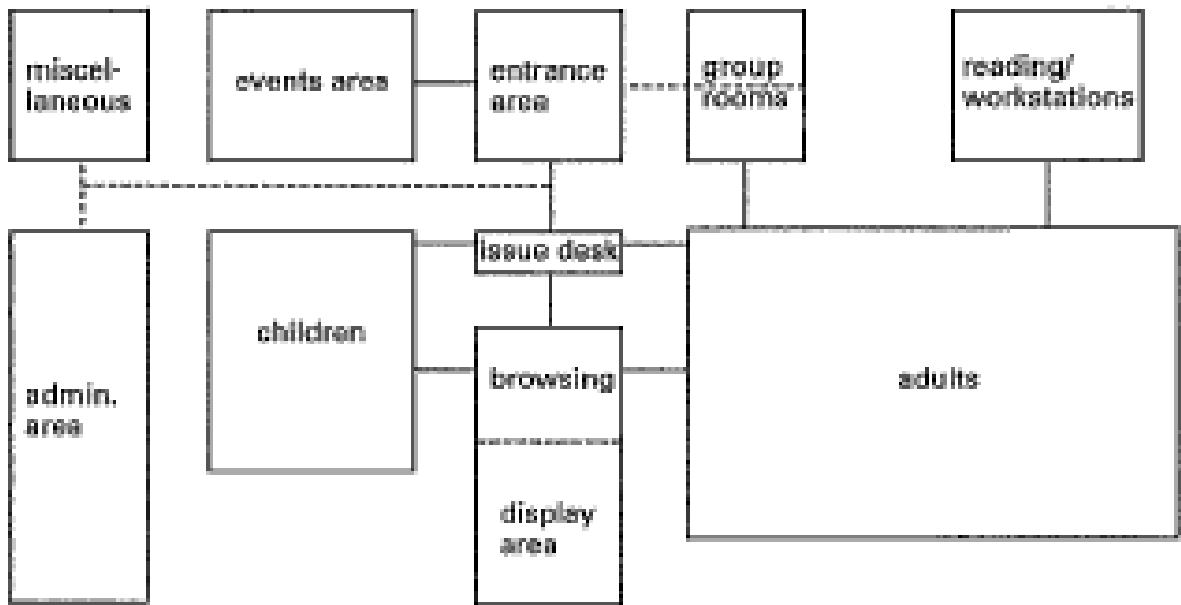
$$\frac{E}{H} = \frac{6^\circ}{0.1} = \frac{27^\circ}{0.5} = \frac{33^\circ}{0.6} = \frac{42^\circ}{0.75}$$

1.00

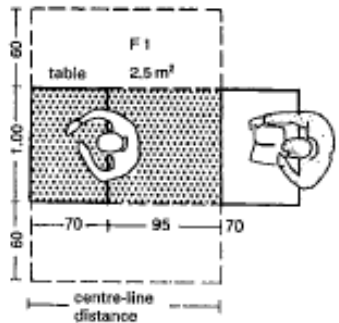


**12** Ensure labels/commentaries readable

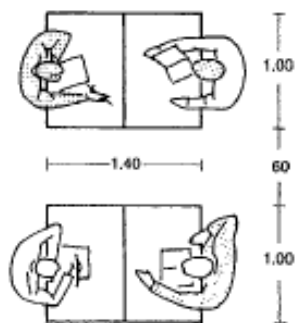
## 5.2. Library



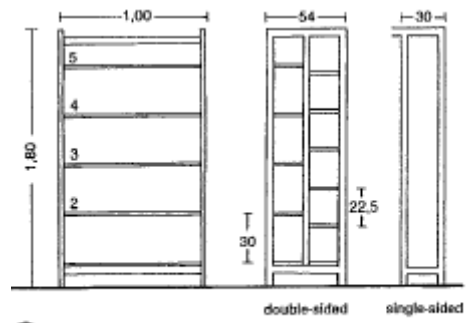
**2** Functional scheme of a medium-sized library



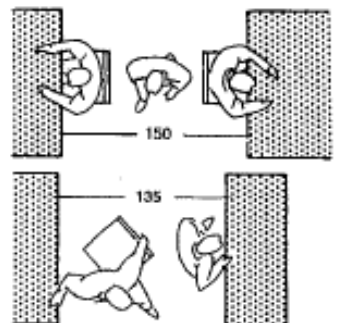
**1** Space for a single workplace → **3**



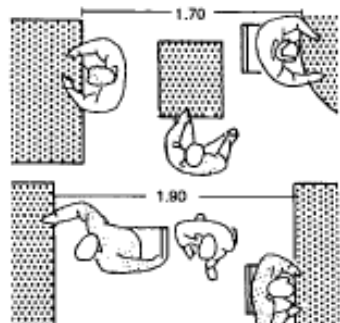
**2** Minimum spacing between tables



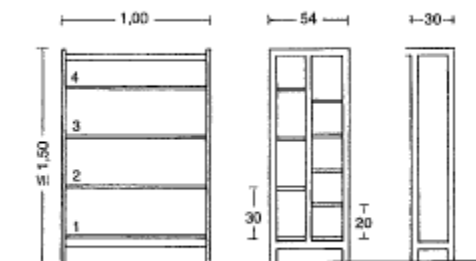
**3** Bookshelves for adults 5-6 shelves, for children 4-5 shelves



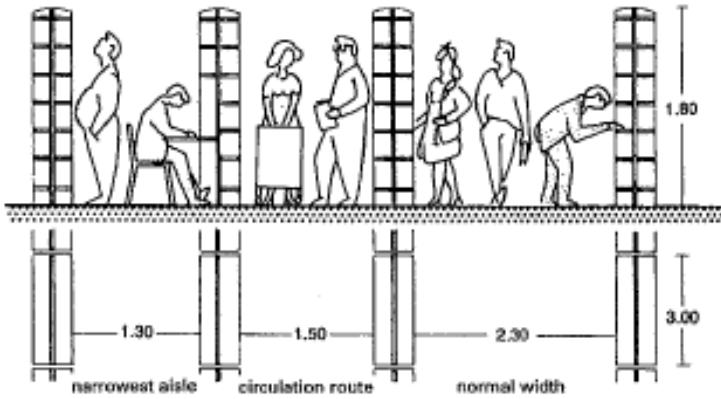
**4** Minimum free room in reading area → **5**



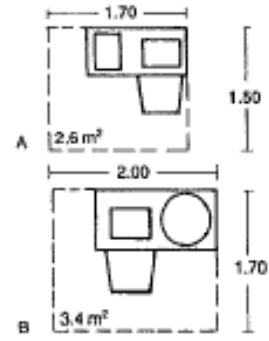
**5** Transporting books between sitting and standing library users → **4**



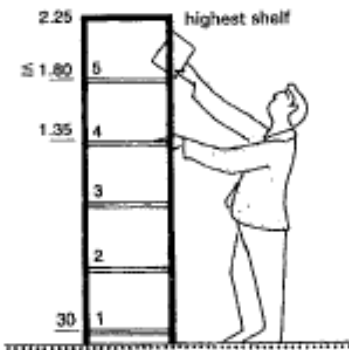
6 → **1**



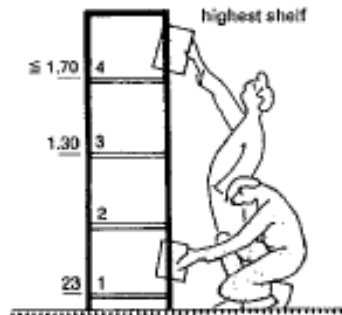
7 Minimum spacing



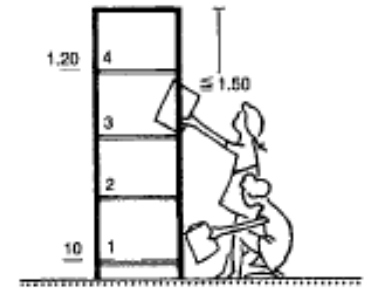
8 Microfiche reader workplace



9 Shelf unit, five shelves

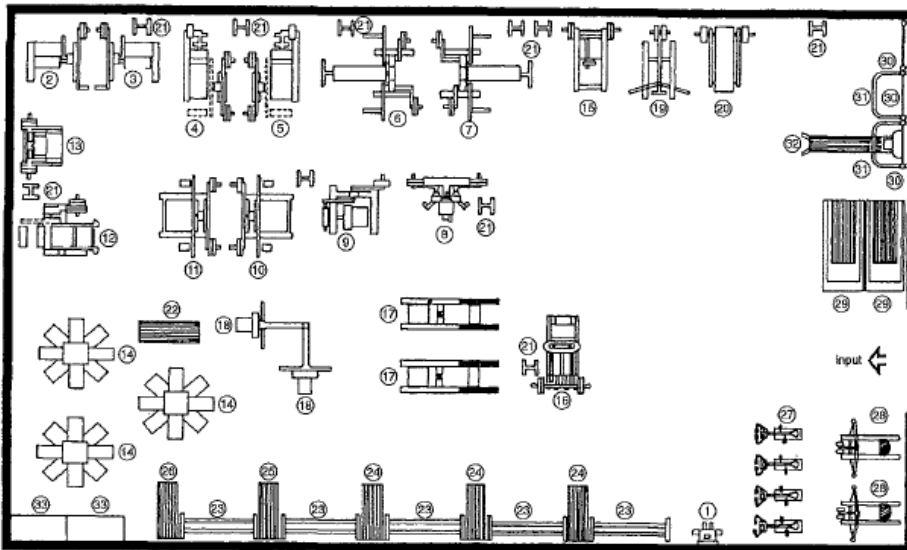


10 Shelf height for schoolchildren



11 Shelf unit, four shelves – small children

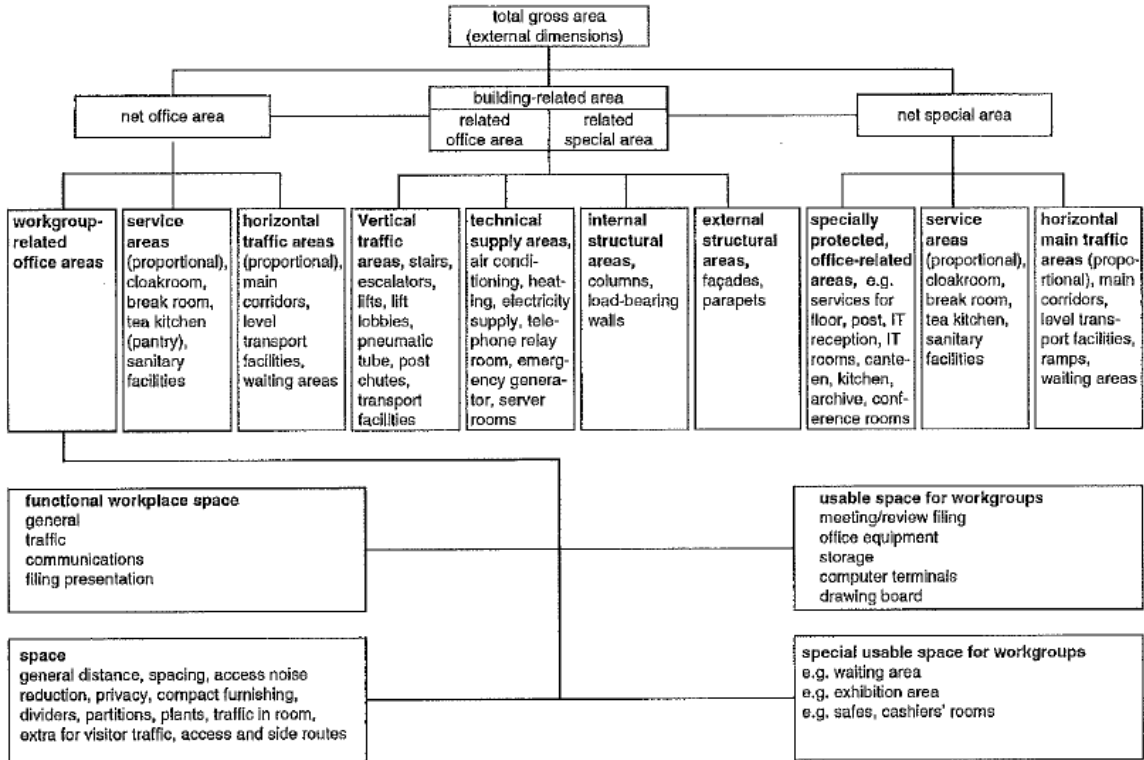
### 5.3. Gym



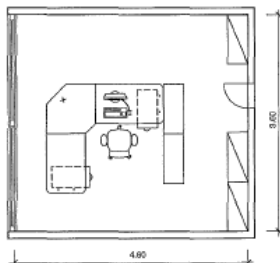
6 Example of a 200 m² fitness room

- ① hand roller
- ② biceps station
- ③ triceps station
- ④ pull-over machine I
- ⑤ pull-over machine II
- ⑥ Latissimus machine I
- ⑦ Latissimus machine II
- ⑧ chest station
- ⑨ torso station
- ⑩ hip station I
- ⑪ hip station II
- ⑫ leg station
- ⑬ foot station
- ⑭ multi-training centre
- ⑮ press apparatus I
- ⑯ leg press apparatus I
- ⑰ stomach muscle station
- ⑱ pulling machine
- ⑲ press-up apparatus
- ⑳ Latissimus floor bells
- ㉑ small disc stand
- ㉒ training bench
- ㉓ short dumbbell stand
- ㉔ sloping bench I
- ㉕ all-round bench
- ㉖ multi-training bench
- ㉗ cycle ergometer
- ㉘ rowing machine
- ㉙ running belt
- ㉚ wall bars
- ㉛ press-up bar
- ㉜ stomach muscle board
- ㉝ equipment cupboard

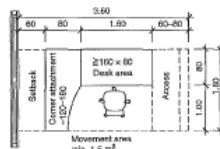
## 5.4. Administration & Offices



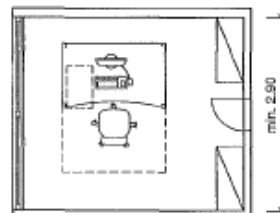
### 3 Organisational structure of office space (Lappat)



6 Example: office management



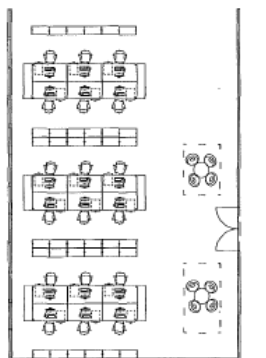
7 Space required for single workstation with additional shelf space



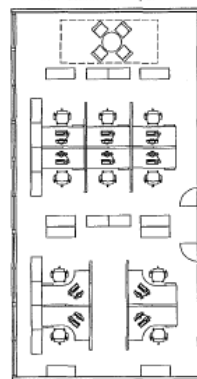
1 Example: single office



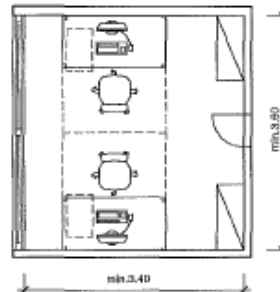
2 Minimum space requirement for a single workstation



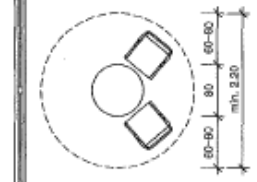
8 Example: workstation layout in a large group office



9 Example: workstation layout in a small group office



3 Example: double office with wall-oriented workstations

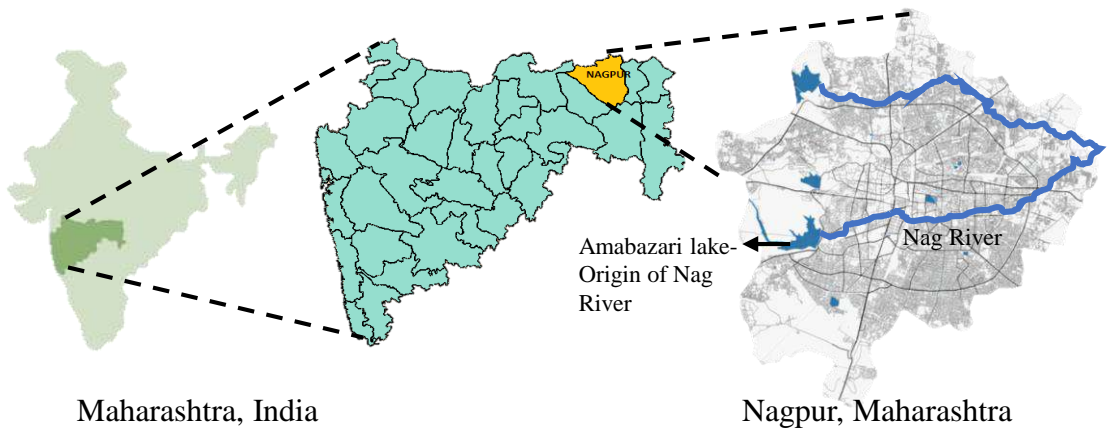


4 Space required for meeting zone

## CHAPTER 6 – ABOUT NAG RIVER

### 6.1. Introduction of Nag River

- The Nag river is a river flowing through the city of Nagpur in Maharashtra, India. The length of the river in the city limits is 17 kms. Its width ranges from 12 to 40 m and depth varies from 2 to 4.5 m.
- Nag river originates from Ambazari lake's overflow weir at the west of the orange city and flows from the west to the east following natural slope of the landform to eventually join Kanhan river.
- Total length of nag river up to the confluence with Kanhan river at Agargaon is about 68 km. Forming a part of the Kanhan-Pench river system.



### 6.2. Current Condition of Nag River

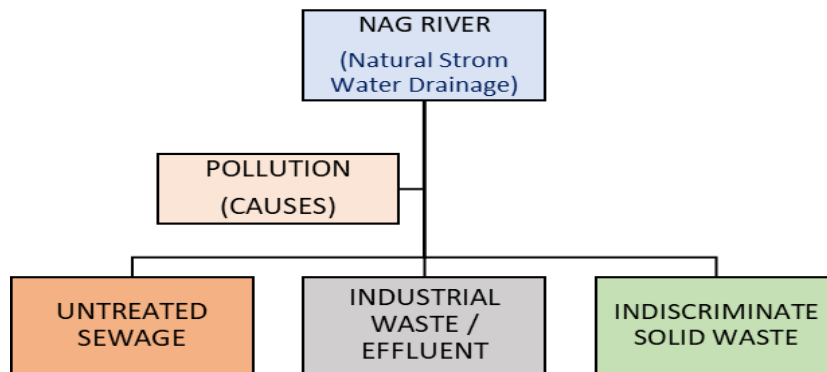


### 6.3. Impact of Nag River Pollution

According to nag river basin action plan prepared by Maharashtra pollution control board (MPCB), nag river is the main culprit for unsatisfactory water quality in Gosikhurd dam (Bhandari district), built on Wainganga river (MPCB, 2011).



### 6.4. Causes of Nag River Pollution



### 6.5. Significance of Nag River

The Nag River is crucial to Nagpur's citizens for its historical significance, cultural heritage, and environmental role. It supports local agriculture, forms part of the city's drainage system, and provides recreational spaces. Despite pollution challenges, its preservation is vital for sustaining Nagpur's ecological and cultural vitality.

**RIVER TO NULLAH TO RIVER**

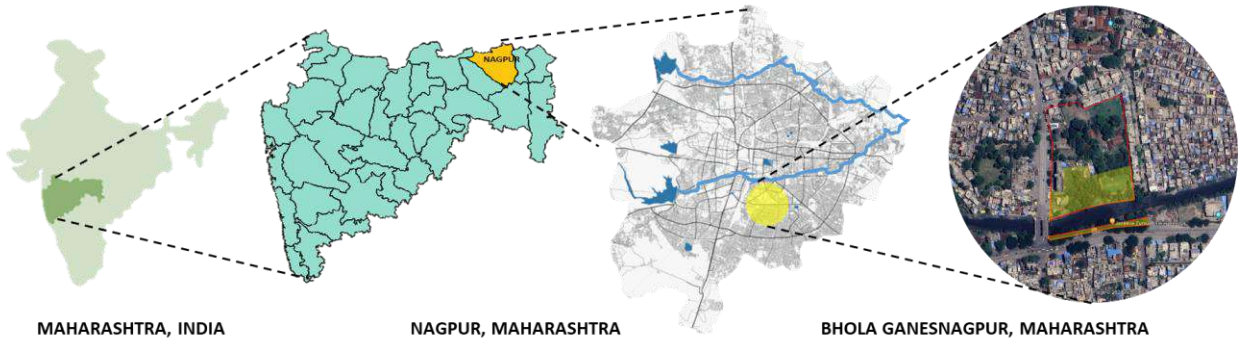
- > Nag river and its tributaries Pili and Pora are nullahs as NMC and NIT release untreated sewage
- > Rivers polluting city environment as well as Kanhan, Wainganga rivers & Gosikhurd dam
- > HC directed NMC to stop pollution and rejuvenate rivers in 2010
- > NMC prepared Nag River Pollution Abatement Project
- > Proposal is to lay sewage lines, build STPs and other infra
- > to end pollution
- > Revised cost is ₹1,927cr, and likely to increase as works will take 8 years
- > Centre will bear ₹1,115.22cr, state ₹507.36cr and NMC ₹304.41cr
- > JICA will give long-term loan to Centre, state, which will repay loan
- > State cabinet approved project and revised cost few months ago
- > Union cabinet considered project on Wednesday

<https://epaper.lokmat.com/lokmattimes/> (Dec 08, 2023)

# CHAPTER 7 – SITE SELECTION

## 7.1. Introduction and Justification:

The site is in Nagpur, the proposed site for riverfront development have been chosen due to its prime location and immense potential for revitalization. The site offers stunning waterfront views, creating a natural draw for visitors and residents alike. Additionally, its proximity to key amenities and infrastructure makes it highly accessible and conducive to economic growth. Moreover, the area's historical significance adds cultural value to the project, offering opportunities for preservation and celebration of the region's heritage. By developing this riverfront, we can create a vibrant community hub, stimulate tourism, and enhance the quality of life for all who live, work, and play in the area.



MAHARASHTRA, INDIA

NAGPUR, MAHARASHTRA

BHOLA GANESNAGPUR, MAHARASHTRA

## 7.2. Site & Surroundings:



1. LATE APPAJI PUNJE EDUCATION COMPLEX



2. JAMDAR HIGH SCHOOL



3. SWAMI SITARAMDAS HIGH SCHOOL



4. MANOHARRAO KAMBDE MAHAVIDYALAYA



5. SHREE CHHTRAPATI VIDYALAYA



6. SURESH BHAT AUDITORIUM



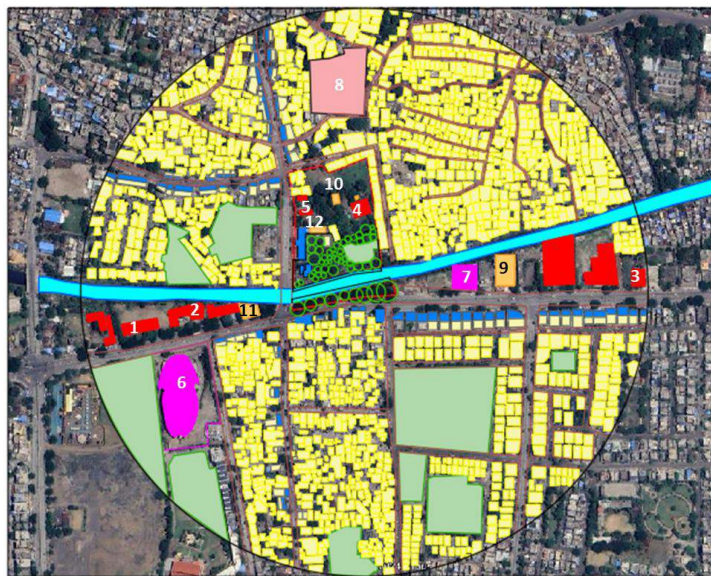
7. NIT KARMACHARI SANSKRUTIK SABHAGRUHA



8. CHTANVIS WADA



9. JAIN TEMPLE



12. VITTHAL RUKMINI TEMPLE



11. JAIN TEMPLE

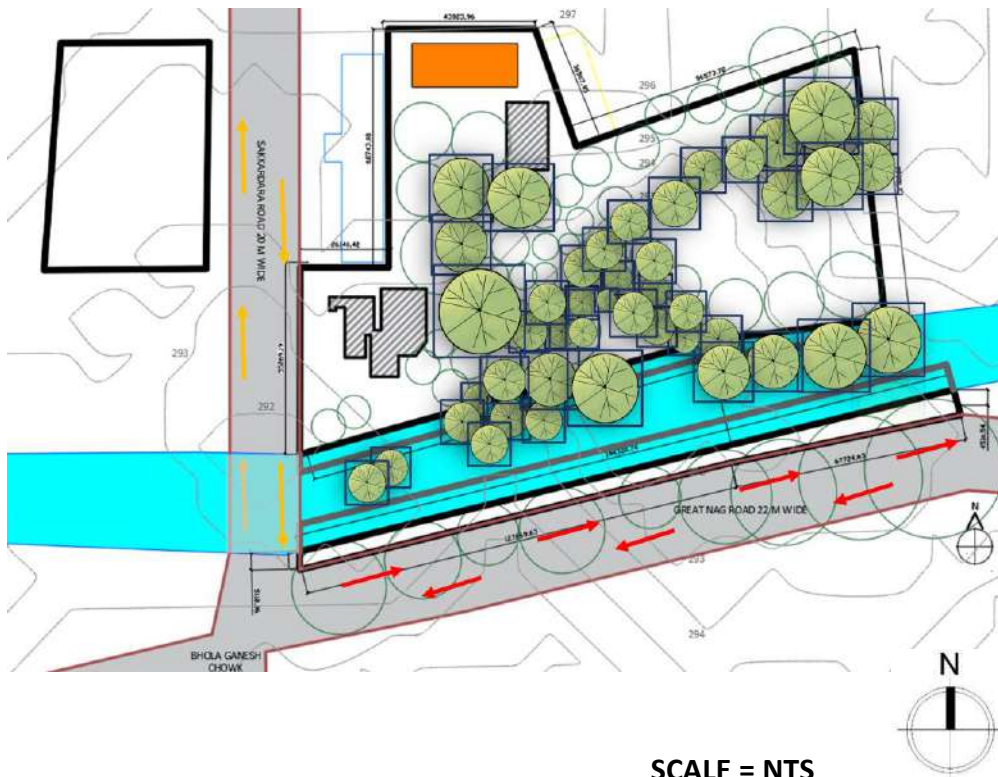


10. SANTA SONAJI MATH

### 7.3. Site



**Bhola Ganesh Chowk, Mahal, Nagpur, Maharashtra**



**SCALE = NTS**

**• AREA = 18683.04 sqm**



## CHAPTER 8 – SITE SELECTION

S.No.	Spaces	No. of Units	Timing	No. of Users	Area (sqm)	Total	Grand Total
<b>1</b>	<b>Admin Area</b>		<b>8 AM - 9 PM</b>				<b>560</b>
	Reception & Waiting Area				10 + 30	40	
	Admin Office	1		4	20	20	
	Director Cabin with Toilet	1			40	40	
	Estate Manger With Toilet	1			30	30	
	Plumber, Electrician, Janitor	3			20	60	
	Housekeeping Area (male and female)	2			20	40	
	Store Room (Class 1,2,3)	3			20	60	
	Toilet (As per NBC norms)						
	Accounts Department with	1		3	30	30	
	Store Room	1			10	10	
	Record Room	1			20	20	
	Conference Room	2		20	90	180	
	Pantry + Eating Area	1			30	30	
<b>2</b>	<b>Exhibition</b>		<b>10 AM - 6 PM</b>				<b>986</b>
	Reception				10	10	
	Ticket area	1			6	6	
	Permanent Art Gallery	1		35 - 40	150	150	
	Art Gallery	2		35 - 40	120	240	
	AV room	2		40	90	180	
	Workshop Room	4		20 - 25	45	180	
	Store Room	3			20	60	
	Curator Cabin with Toilet	1		1	20	20	
	Toilet (As per NBC norms)						
	Vocational Training Room	2		35	70	140	
<b>3</b>	<b>Multipurpose Hall</b>	<b>2</b>	<b>10 AM - 3 PM 6 PM - 11 PM</b>				<b>820</b>
	Hall			200	350	700	
	Attached Toilet						
	Changing Room	4(2 for each)			25	100	
	Store Room	2(1 for each)			10	20	
<b>4</b>	<b>Fitness Centre</b>		<b>6 AM - 6 PM</b>				<b>555</b>
	Manager Cabin with Toilet	1			35	35	
	Meditation Room	1		40	90	90	
	Yoga Room	1		40	100	100	
	GYM	1		25	100	100	
	Zumba Room	1		40	100	100	
	Aerobics Room	1		40	90	90	
	Toilet (As per NBC norms)						
	Changing Room with Locker	2			20	40	
<b>5</b>	<b>Library</b>		<b>9 AM - 9 PM</b>	<b>200</b>			<b>433</b>
	Librarian Office	1			30	30	
	Reading Section	1			350	350	
	Achieve Room	1			30	30	
	Store Room	1			20	20	
	Xerox	1			3	3	
<b>6</b>	<b>Jyestha Nagarik Virangula Kendra</b>		<b>9 Am - 6 Pm</b>				<b>300</b>
	Office				20	20	
	Community Hall / Sports Room	1		60	100	100	
	Health Check Up Room / First Aid Room	1		20	40	40	
	Workshop Room	2		15-20	40	80	
	Store Room				20	20	
	Toilet (As per NBC norms)	2			20	40	





## **CHAPTER 9 – DESIGN PROJECT**



# SITE ANALYSIS

## LOCATION - -- BHOLA GANESH CHOWK, NAGPUR, MH

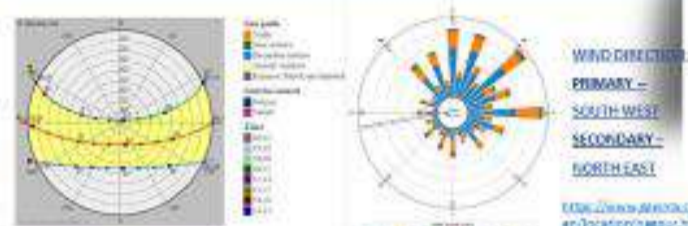


MAHARASHTRA, INDIA      NAGPUR, MAHARASHTRA      BHOLA GANESNAGPUR, MAHARASHTRA

### TOPOGRAPHY



### SUN PATH & WIND DIRECTION



### SITE SELECTION -

THIS PROPOSED SITE FOR RIVERFRONT DEVELOPMENT HAVE BEEN CHOSEN DUE TO ITS PRIME LOCATION AND IMMENSE POTENTIAL FOR REVITALIZATION.

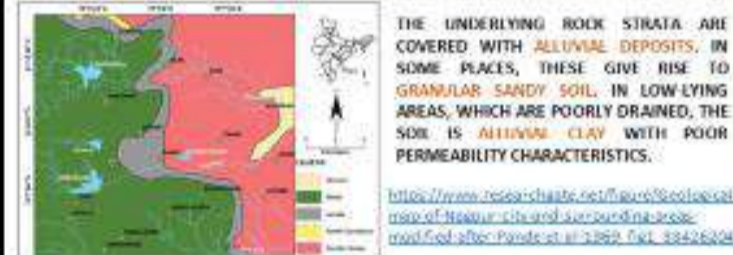
THE SITE OFFERS STUNNING WATERFRONT VIEWS, CREATING A NATURAL DRAW FOR VISITORS AND RESIDENTS ALIKE.

ADDITIONALLY, ITS PROXIMITY TO KEY AMENITIES AND INFRASTRUCTURE MAKES IT HIGHLY ACCESSIBLE AND CONDUCTIVE TO ECONOMIC GROWTH.

MOREOVER, THE AREA'S HISTORICAL SIGNIFICANCE ADDS CULTURAL VALUE TO THE PROJECT, OFFERING OPPORTUNITIES FOR PRESERVATION AND CELEBRATION OF THE REGION'S HERITAGE.

BY DEVELOPING THIS RIVERFRONT, WE CAN CREATE A VIBRANT COMMUNITY HUB, STIMULATE TOURISM, AND ENHANCE THE QUALITY OF LIFE FOR ALL WHO LIVE, WORK, AND PLAY IN THE AREA.

### GEOLOGY



### HYDROLOGY



### ABOUT SITE

**TOPOGRAPHY OF SITE:** SITE HAS NATURAL CONTOURS, TOPOGRAPHICALLY THE AREA HAS GRADUAL SLOPE ON THE SOUTH SIDE OF THE SITE.

**SOIL AND VEGETATION ON SITE:** SLIGHTLY DEEP, WELL DRAINED, FINE, ALLUVIAL CLAY SOIL ON VERY GENTLE SLOPE LANDS WITH MEASAS AND BUTTES WITH MODERATE EROSION

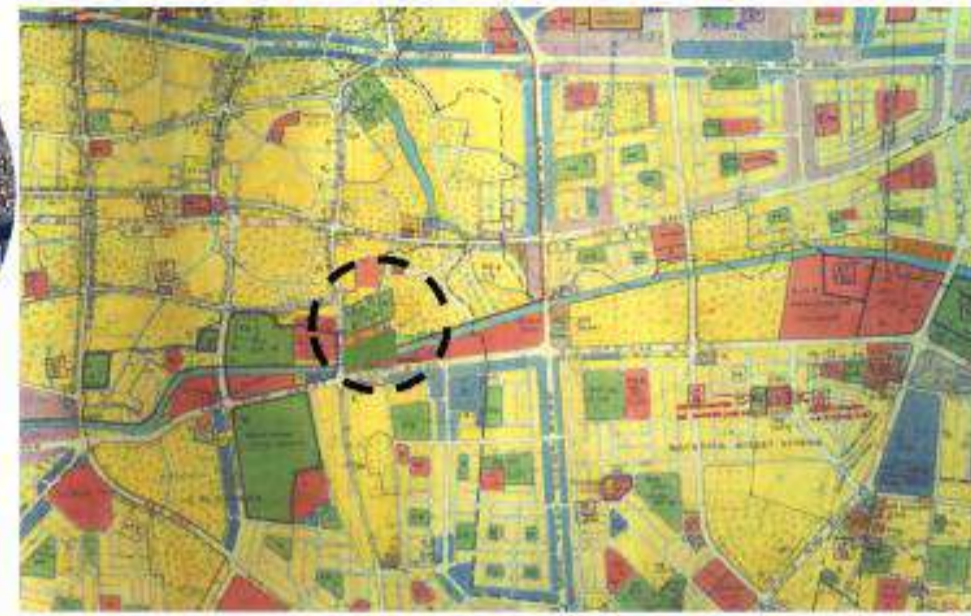
**FLORA & FAUNA (TYPICAL IN NAGPUR):**  
 FLORA - NEEM, PEAPAL, MANGO, ASHOKA, GULMOHAR, BABOOL, IMLI, RINGWORM BUSH, WHITE CHIRPI (SONNERATIA ALBA - MANGROOVES)  
 FAUNA - KINGFISHER, CROW, PIGEON, RED RUMPED SWALLOW, BLACK STORK, BAR HEADED GOOSE, SPECTACLED COBRA, CRICKET FROG, INDIAN BULL FROG

**MICROCLIMATE:** THE MICROCLIMATE OF THE SITE IS AFFECTED BY THE FULLY GROWN EVERGREEN TREES AS IT HELPS TO COOL THE ENVIRONMENT - BY INTERCEPTING SOLAR RADIATION & DIRECTING AIR MOVEMENT. NAG RIVER PROVIDES COOL BREEZE FROM THE SOUTHERN PART OF THE SITE.

### TOTAL NO. OF TREES ON SITE



## DEVELOPMENT PLAN - NAGPUR (2000)



### LEGENDS:



## SITE AND SURROUNDINGS



### WHY PROPOSED SITE WOULD BE A SUCCESS?

- PRIME LOCATION:** THE PROPOSED SITE OFFERS A PRIME LOCATION ALONG THE RIVERFRONT, PROVIDING STUNNING NATURAL VIEWS AND A SERENE ENVIRONMENT FOR RESIDENTS AND VISITORS.
- ECONOMIC POTENTIAL:** THE DEVELOPMENT PRESENTS SIGNIFICANT ECONOMIC OPPORTUNITIES, ATTRACTING BUSINESSES, TOURISM, AND INVESTMENT TO THE AREA, LEADING TO JOB CREATION AND INCREASED REVENUE.
- RECREATIONAL AMENITIES:** WITH AMPLE SPACE FOR RECREATIONAL ACTIVITIES SUCH AS BOATING, FISHING, AND WATERFRONT DINING, THE SITE BECOMES A DESIRABLE DESTINATION FOR LEISURE AND ENTERTAINMENT.
- COMMUNITY ENGAGEMENT:** INCORPORATING PUBLIC SPACES AND GATHERING AREAS FOSTERS COMMUNITY ENGAGEMENT AND SOCIAL INTERACTION, CREATING A SENSE OF BELONGING AND ENHANCING THE OVERALL QUALITY OF LIFE FOR RESIDENTS.
- SUSTAINABLE DESIGN:** EMBRACING SUSTAINABLE DESIGN PRACTICES ENSURES ENVIRONMENTAL PRESERVATION, MITIGATES CLIMATE IMPACTS, AND ENHANCES THE LONG-TERM VIABILITY AND ATTRACTIVENESS OF THE DEVELOPMENT.

### SITE PHOTOS



### STRENGTH

- NATURAL FEATURE: THE RIVER FORMS AN EXCELLENT OPPORTUNITY TO PROVIDE FOR AN ACTIVE PUBLIC PLACE.
- THE SITE HAS MSEB OFFICE AND IS NEAR TO TEMPLES AND INSTITUTIONAL BUILDINGS MAKING THIS A VERY ACTIVE AREA.
- POTENTIAL FOR PEDESTRIAN CONNECTIONS AND WALKING.
- CONSERVING RIVER MANGROOVES (WHITE CHIRPI) WOULD HELP IN FLOOD MITIGATION AND REDUCING RIVER POLLUTION.

### WEAKNESS

- THE RIVERFRONT IS POORLY CONNECTED IN TERMS OF PEDESTRIAN LINKS, FUNCTIONS, VIEWS AND VISTAS.
- THE POOR PUBLIC SPACES AND THE OFFICE / INSTITUTION FOCUSED ACTIVITIES IN THIS AREA CAUSE:
- FRAGILE USER PATTERNS.
- LACK OF PUBLIC LIFE AND PUBLIC SPACES.

### OPPORTUNITIES

- THERE ARE SEVERAL HISTORICAL AND CULTURALLY SIGNIFICANT MONUMENTS IN CLOSE PROXIMITY TO THE SITE.
- DENSE PLANTATION.

### THREATS

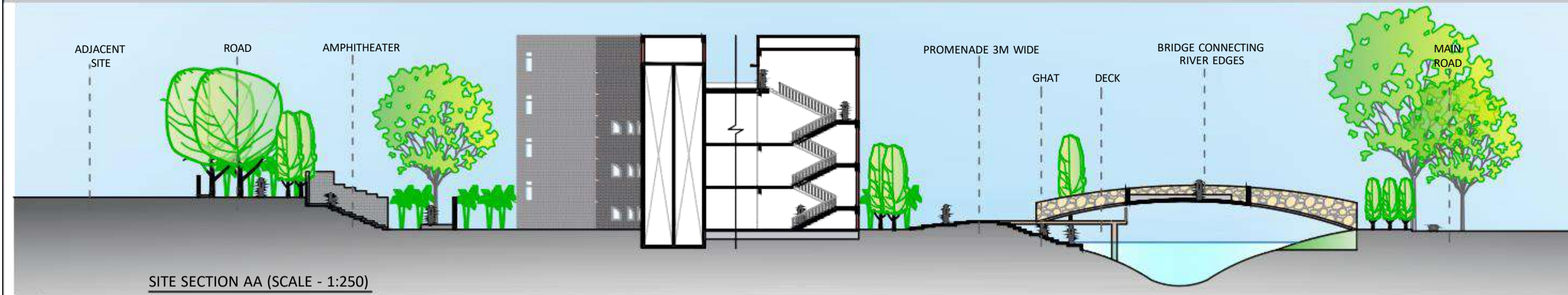
- THE OPEN SPACE HAS LOST ITS IMPORTANT ROLE AS A PREFERRED MEETING PLACE.
- LACK OF SAFETY.



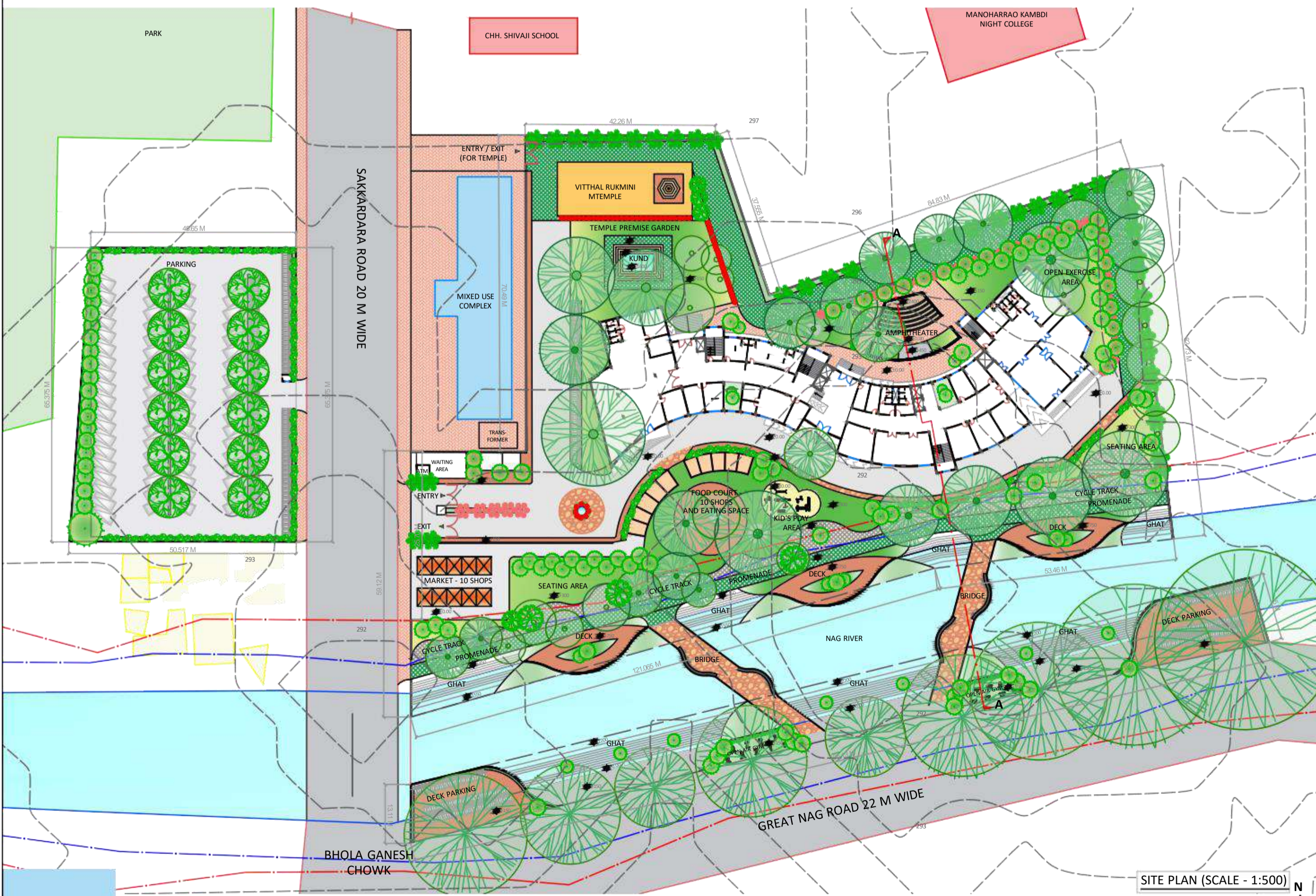
# 12. JANAKALYAN - REVITALISATION ON THE BANKS OF NAG RIVER, NAGPUR - BRIDGING THE GAP WITH NATURE

SITE SECTION AA'

**SITE PLAN WITH GROUND FLOOR PLAN**



MAIN ENTRANCE, WAITING AREA, ATM & MARKET PLACE



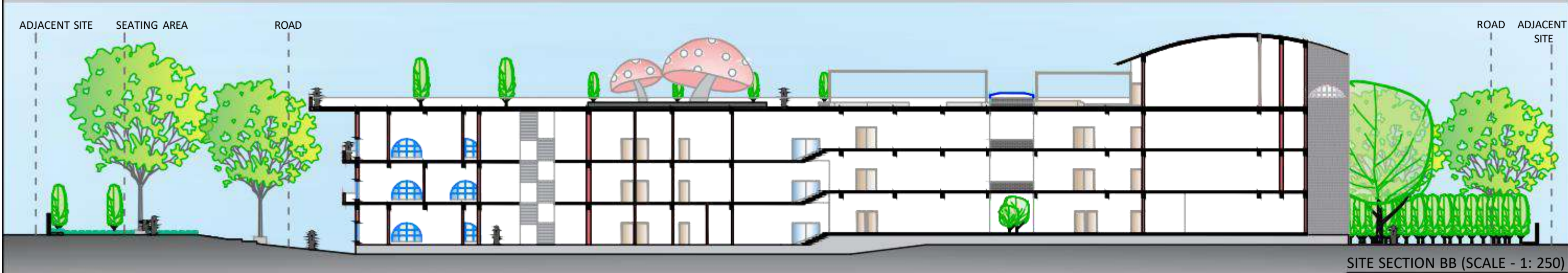
GHATS, BRIDGES CONNECTING EDGES OF RIVER, VIEWING DECK & DECK PARKING



ACTIVITIES AT GHAT

**14. JANAKALYAN – REVITALISATION ON THE BANKS OF NAG RIVER, NAGPUR - BRIDGING THE GAP WITH NATURE**

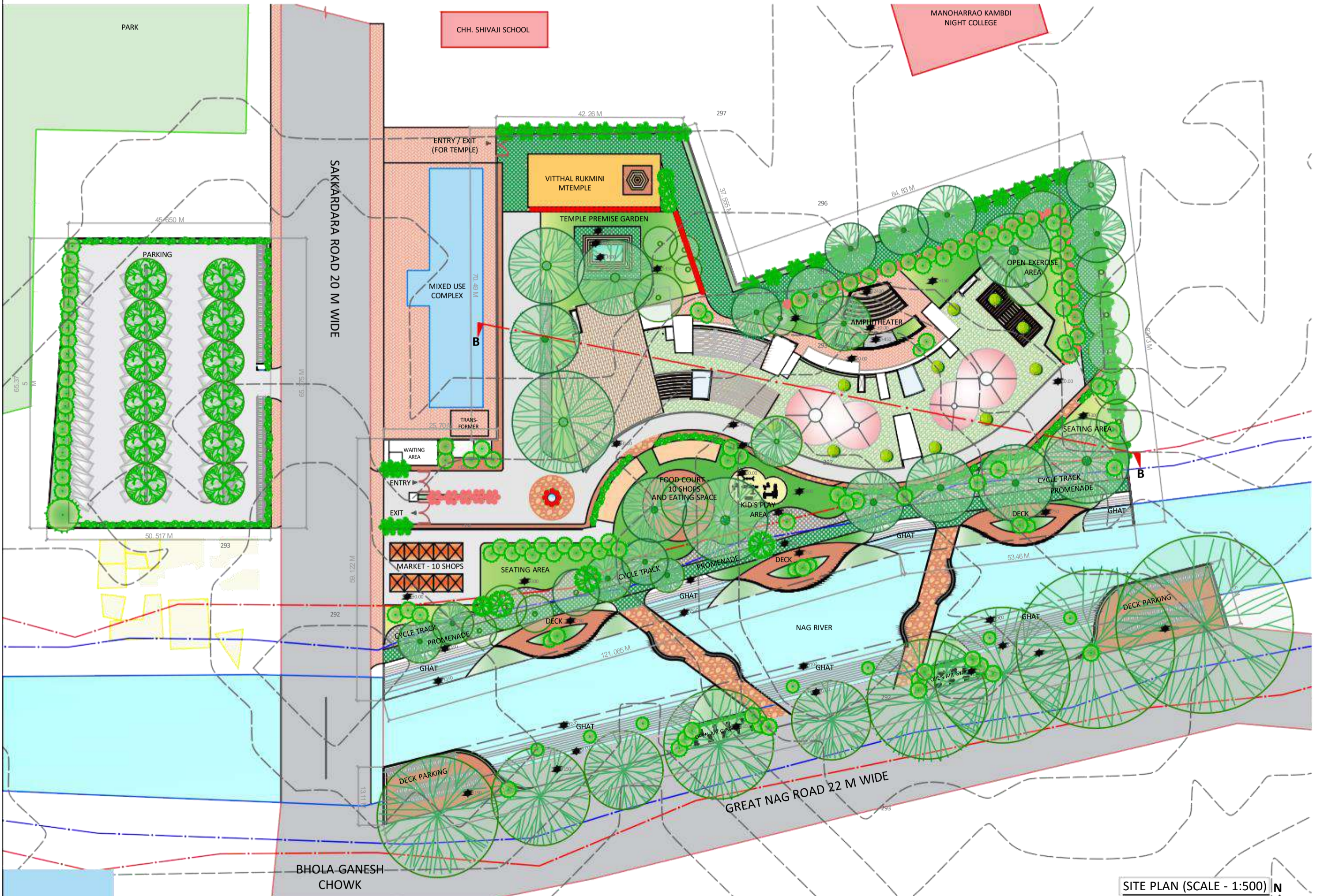
**SITE PLAN WITH ROOF PLAN**



SITE SECTION BB (SCALE - 1: 250)



TEMPLE & LOTUS KUND



SITE PLAN (SCALE - 1:500)



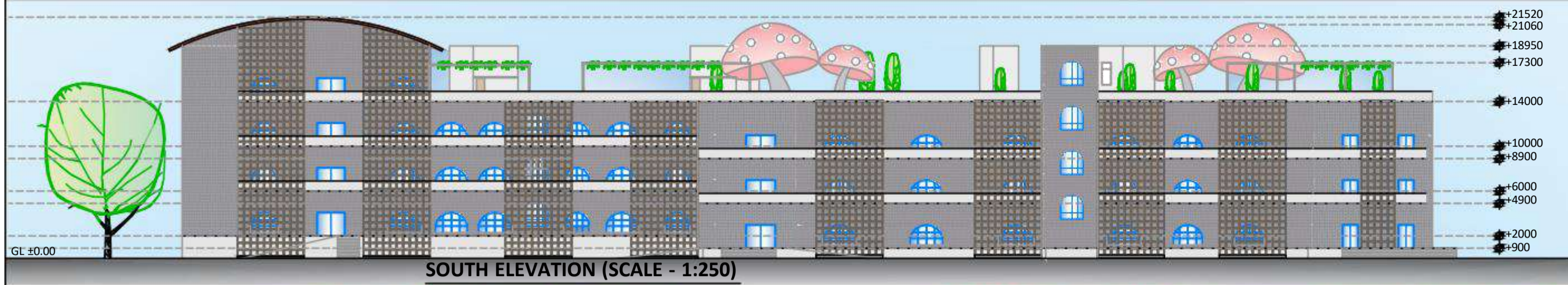
FOOD COURT - HUT STYLE



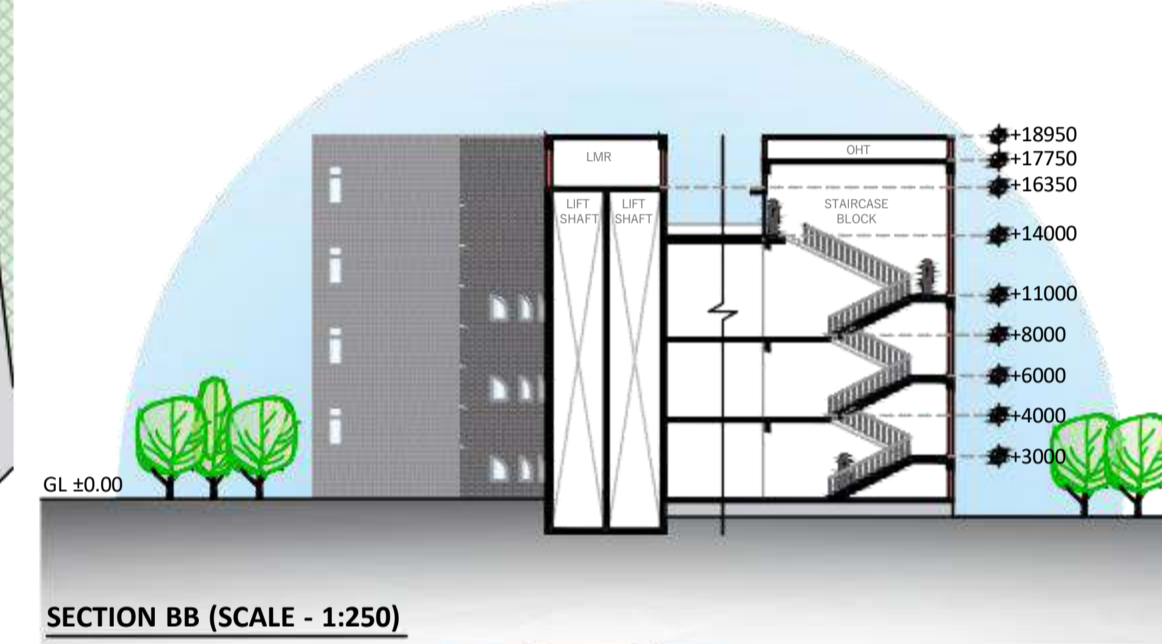
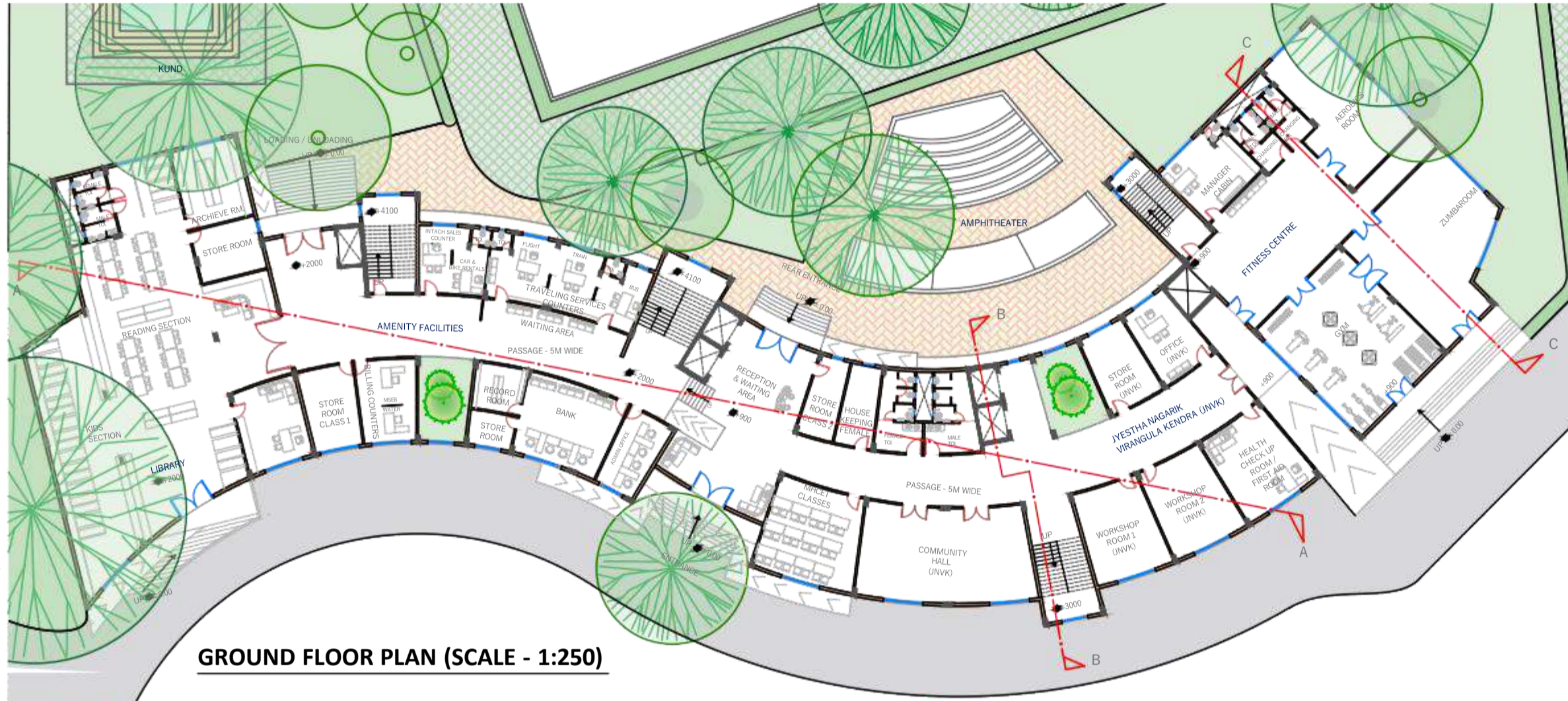
KID'S PLAY AREA

**15. JANAKALYAN – REVITALISATION ON THE BANKS OF NAG RIVER, NAGPUR - BRIDGING THE GAP WITH NATURE**

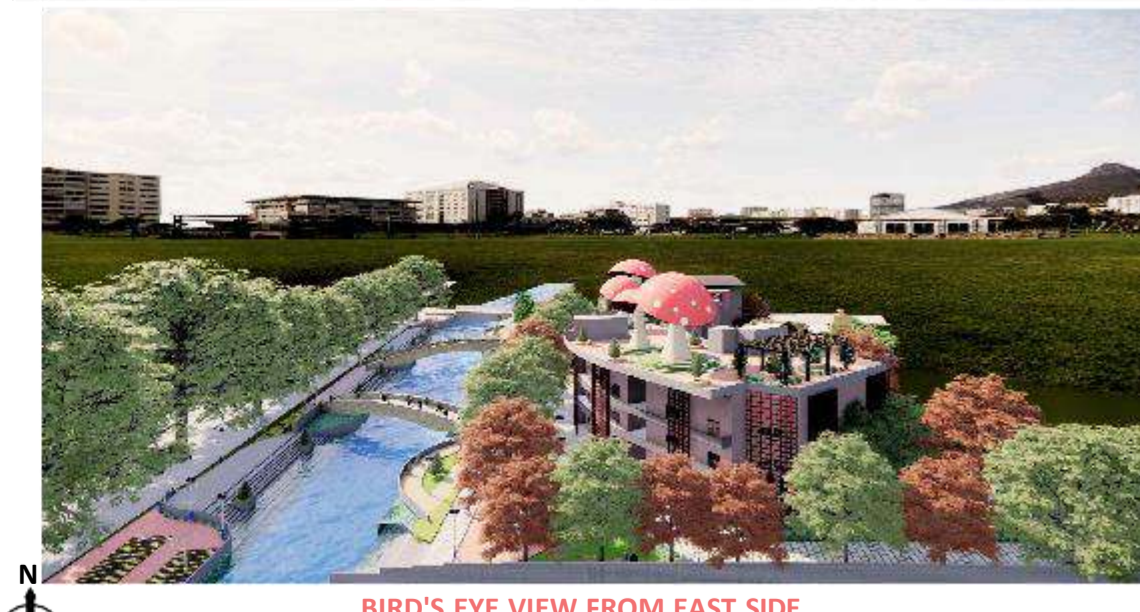
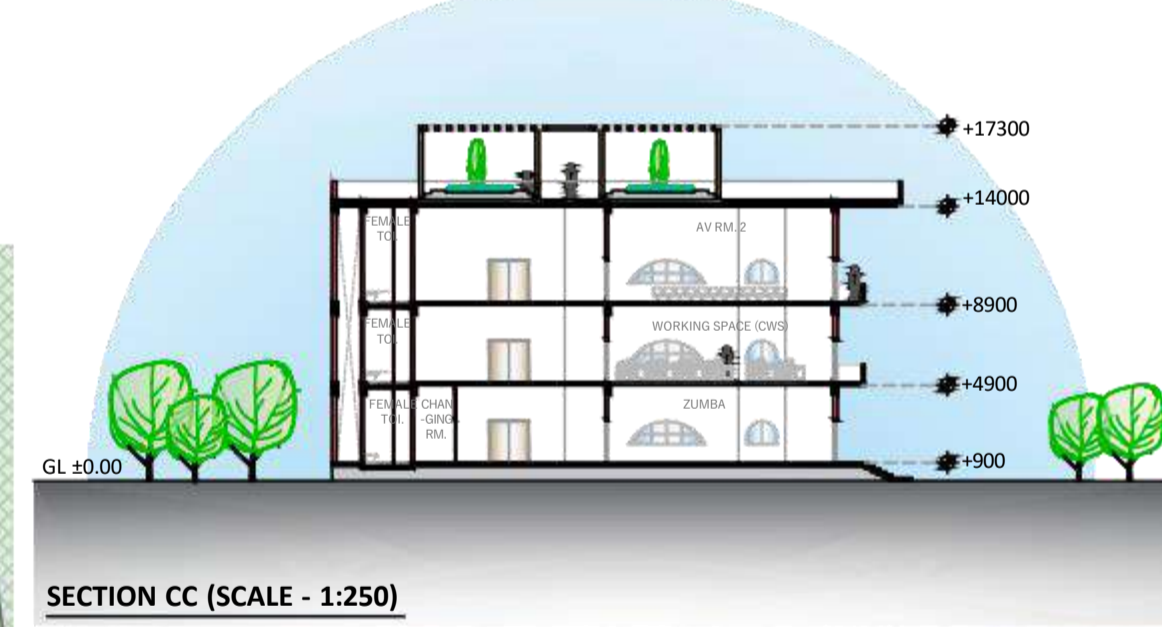
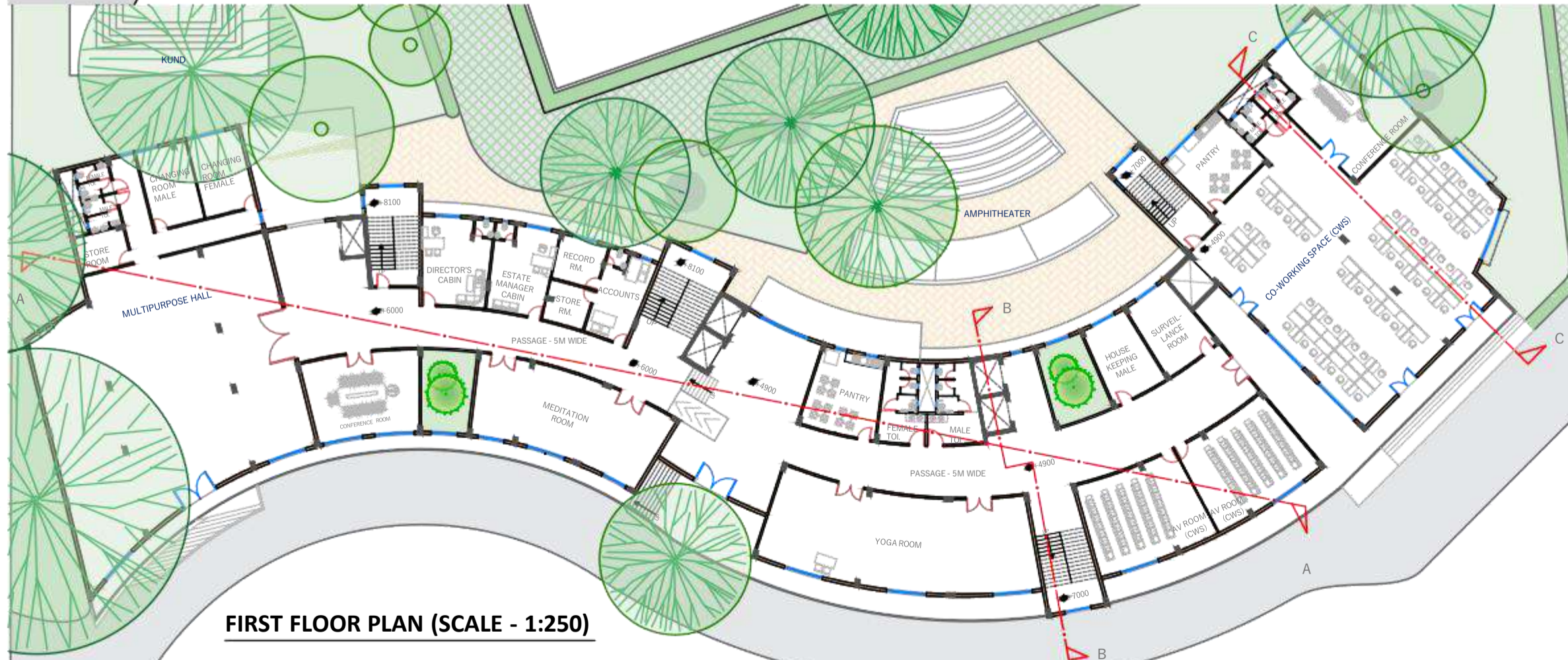
# FLOOR PLANS, SECTIONS & ELEVATION



LEGENDS - GROUND FLOOR		
NO.	SPACE	AREA
<b>A LIBRARY</b>		
	READING SECTION	19.2 X 21.0
	LIBRARIAN'S CABIN	5.0 X 6.2
	STORE ROOM	5.0 X 4.0
	ACHIEVE ROOM	5.0 X 6.0
<b>B ADMIN</b>		
	RECEPTION AND WAITING AREA	
	ADMIN OFFICE	3.8 X 6.0
	STORE ROOM CLASS 1	4.2 X 6.0
	STORE ROOM CLASS 2	2.8 X 6.0
	HOUSEKEEPING FEMALE	2.8 X 6.0
<b>C AMENITY FACILITIES</b>		
	TRAVELING SERVICE COUNTER - FLIGHT, TRAIN, BUS	12.0 X 5.0
	BILLING COUNTERS - MISSB WATER	4.2 X 6.0
	INTACH SALES COUNTER & CAR BIKE RENTALS	5.2 X 5.0
	BANK	7.2 X 6.0
	RECORD ROOM & STORE ROOM	3.8 X 3.4
	MHCET CLASS	7.2 X 7.0
<b>D JYESHTHA NAGARIK VIRANGULA KENDRA</b>		
	OFFICE	4.4 X 6.0
	STORE ROOM	4.4 X 6.0
	COMMUNITY HALL	12.7 X 7.0
	WORKSHOP ROOM 1 & 2	5.0 X 7.0
	HEALTH CHECK UP ROOM / FIRST AID ROOM	5.0 X 7.0
<b>E FITNESS CENTER</b>		
	MANAGER CABIN	5.7 X 5.2
	GYM	9.2 X 11.2
	ZUMBA	10.0 X 11.2
	AEROBICS	10.0 X 8.8
	CHANGING ROOMS	2.4 X 2.0



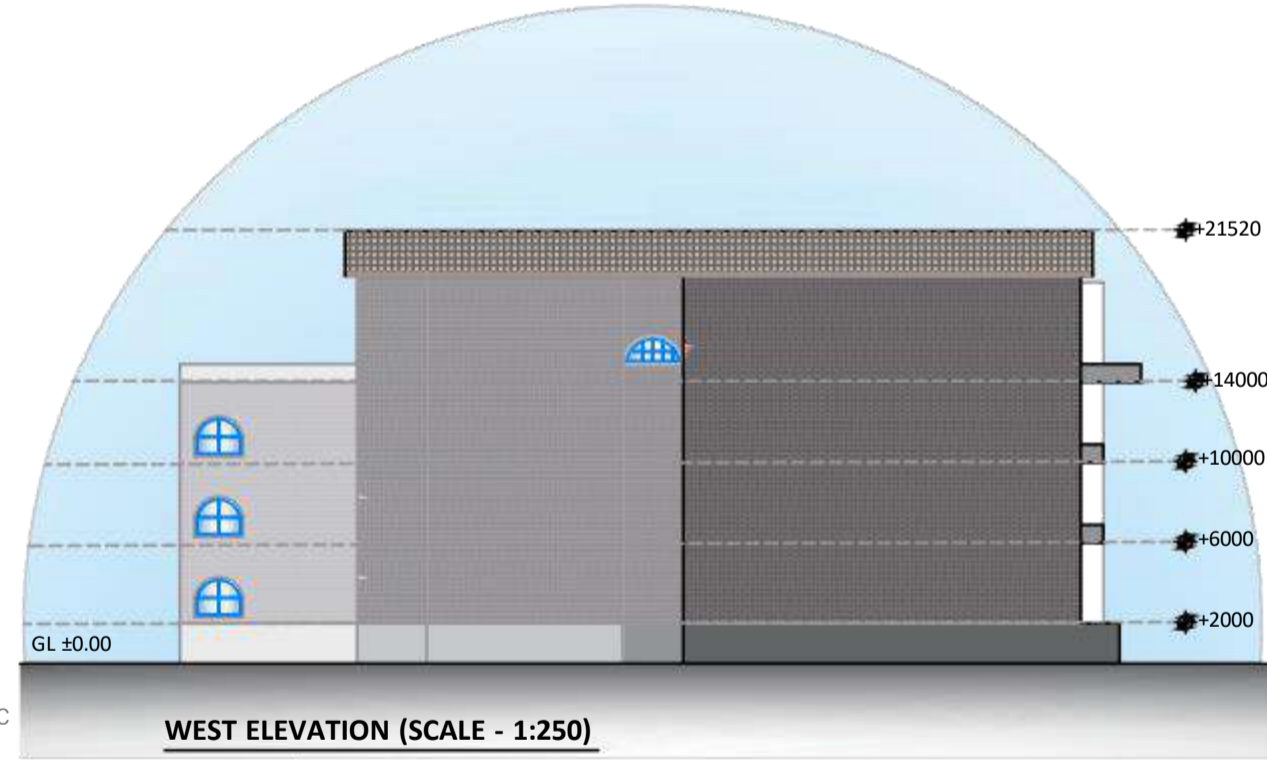
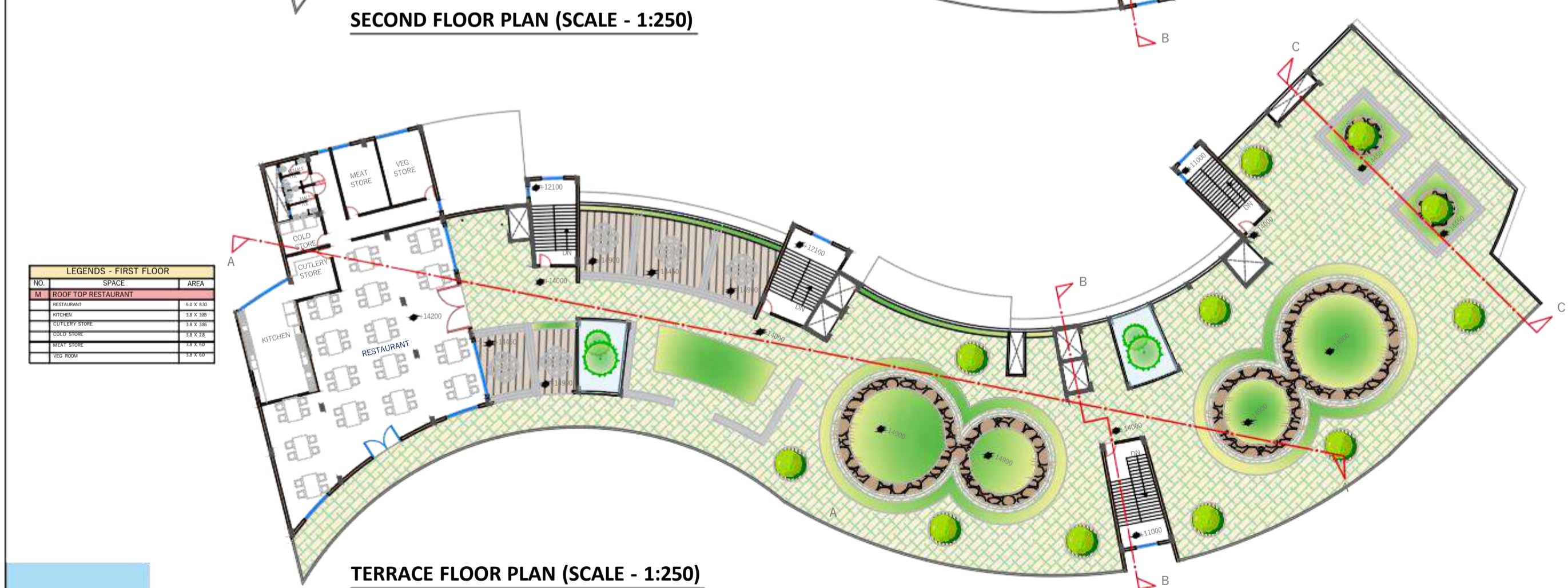
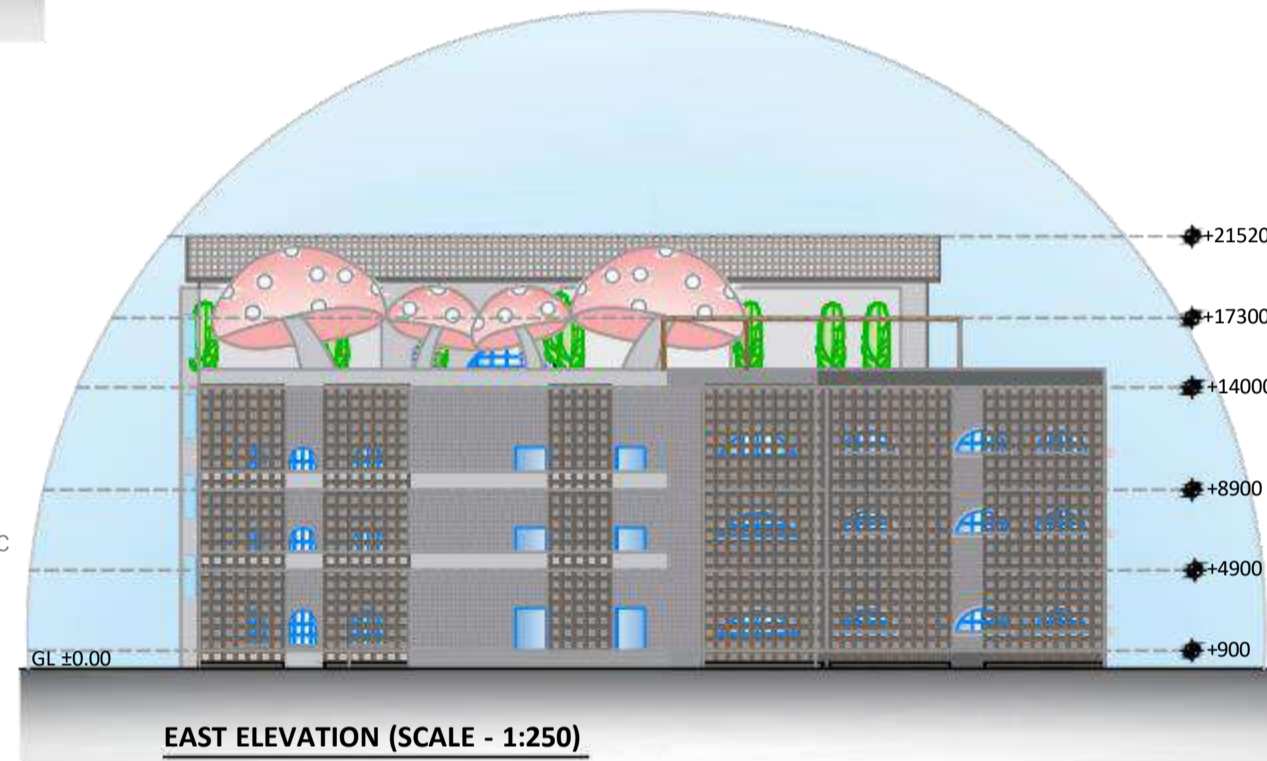
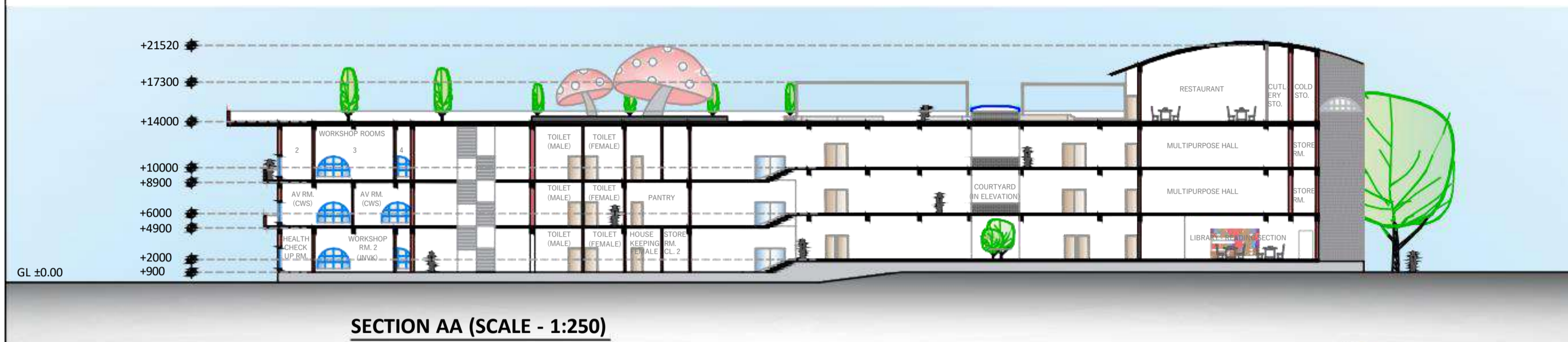
LEGENDS - FIRST FLOOR		
NO.	SPACE	AREA
<b>F MULTIPURPOSE HALL</b>		
	HALL	19.2 X 17.4
	CHANGING ROOMS	3.8 X 6.0
	STORE ROOM	3.8 X 2.8
<b>G ADMIN</b>		
	DIRECTOR'S CABIN	5.4 X 6.5
	ESTATE MANAGER CABIN	4.8 X 6.5
	CONFERENCE ROOM	9.0 X 6.0
	ACCOUNTS	3.7 X 6.5
	RECORD ROOM & STORE ROOM	3.6 X 3.3
	PANTRY & EATING AREA	4.7 X 6.0
	HOUSEKEEPING MALE	4.4 X 6.0
	SURVEILLANCE ROOM	4.4 X 6.0
<b>H FITNESS CENTER</b>		
	YOGA ROOM	20.0 X 7.0
	MEDITATION ROOM	16.0 X 6.0
<b>I CO-WORKING SPACE</b>		
	WORKING SPACE	19.6 X 19.3
	CONFERENCE ROOM	10.0 X 8.8
	AV ROOMS	8.3 X 7.0
	PANTRY & EATING AREA	4.7 X 6.0



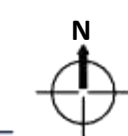
16.

## JANAKALYAN – REVITALISATION ON THE BANKS OF NAG RIVER, NAGPUR - BRIDGING THE GAP WITH NATURE

# FLOOR PLANS, SECTION & ELEVATIONS

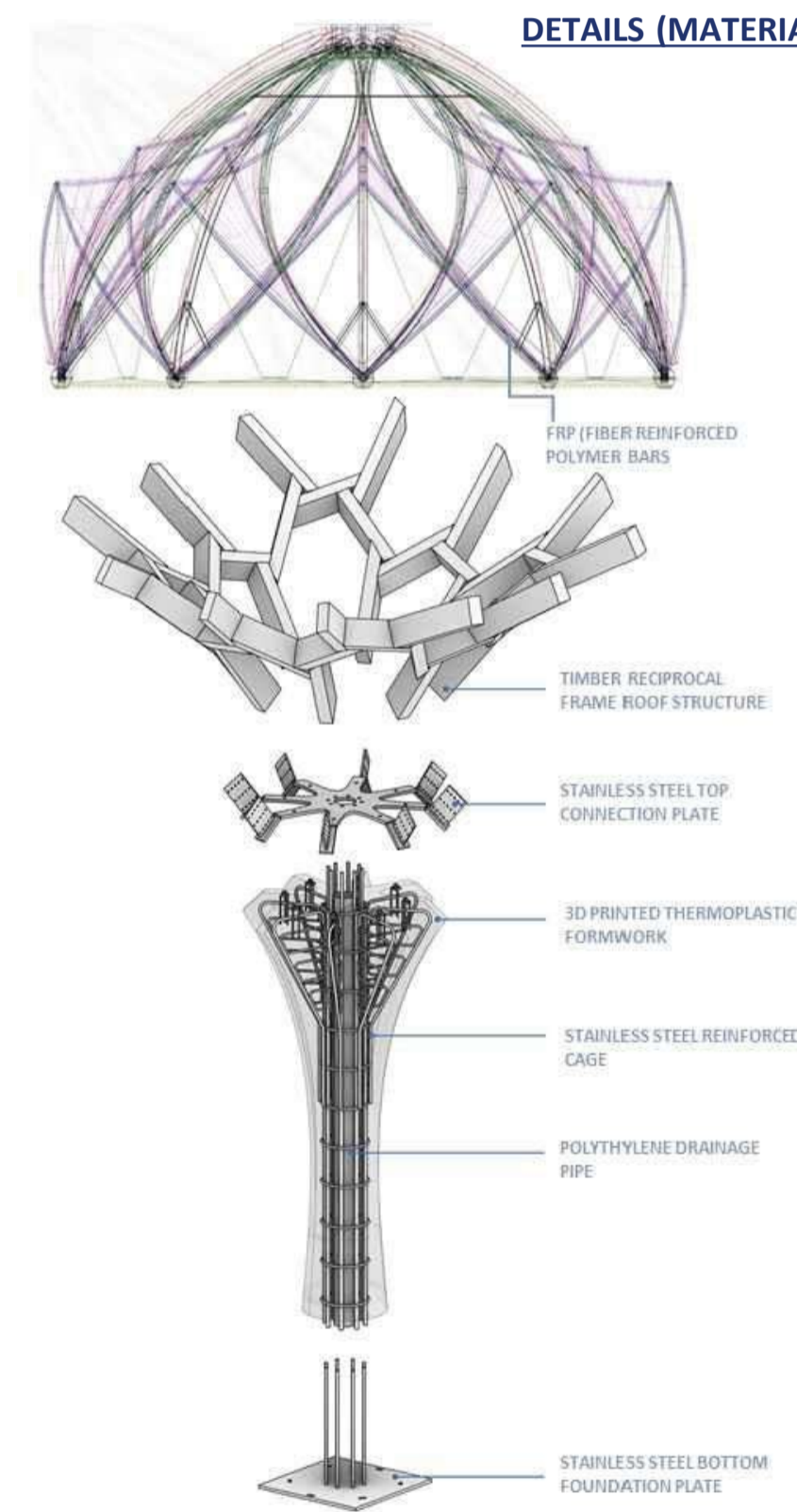
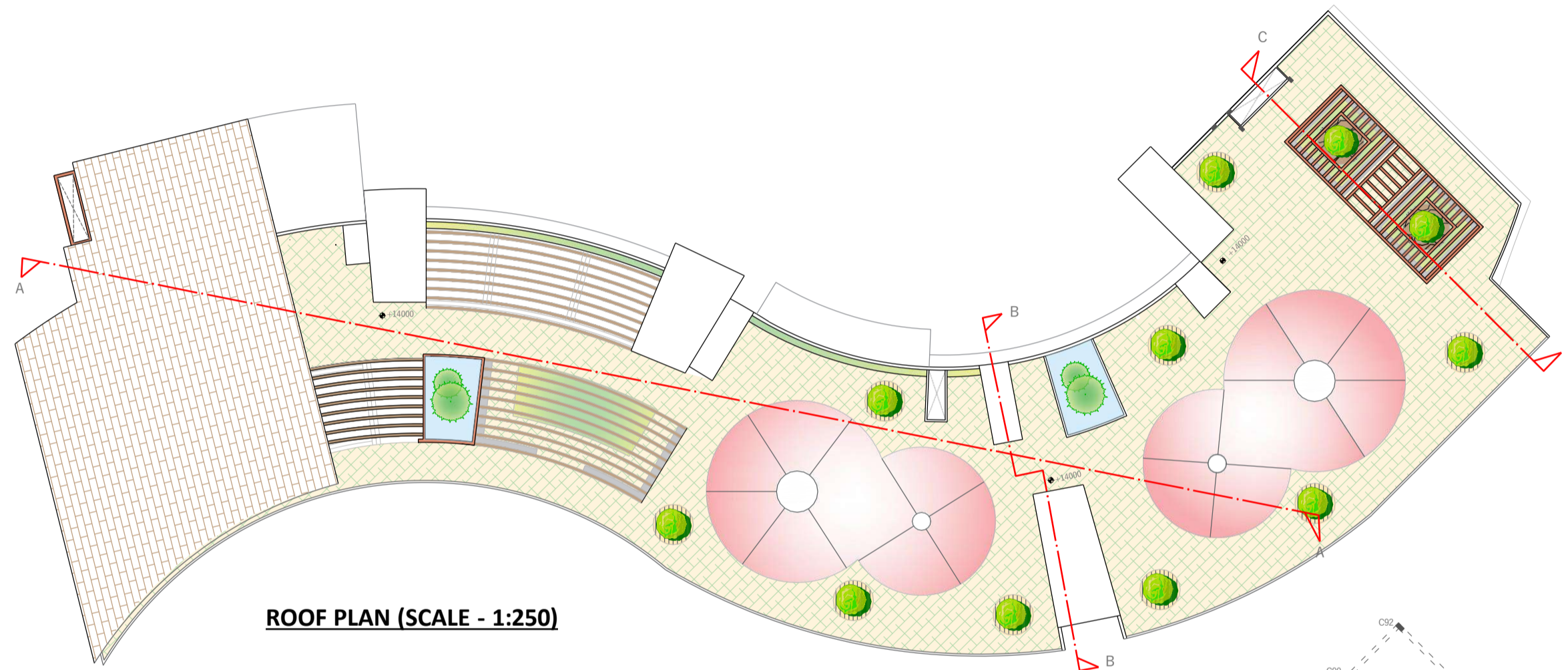
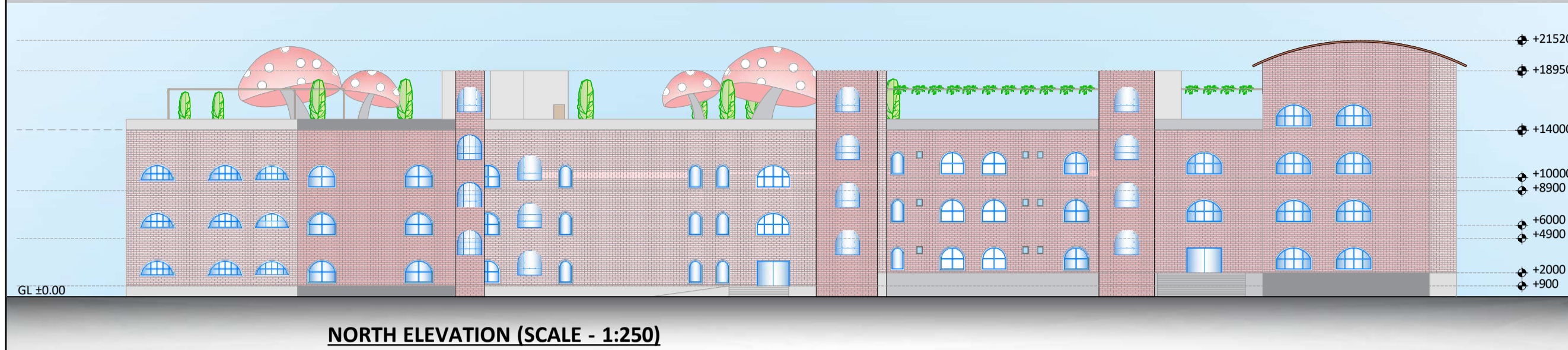


## 17. JANAKALYAN – REVITALISATION ON THE BANKS OF NAG RIVER, NAGPUR - BRIDGING THE GAP WITH NATURE





# FLOOR PLANS, STRUCTURAL LAYOUT, ELEVATION & DETAILS



## DETAILS (MATERIAL EXPLORATION)

### FRP (FIBER REINFORCED POLYMER) BARS

#### ADVANTAGES

1. EXCEPTIONAL TENSILE STRENGTH
2. LIGHT WEIGHT & DURABLE
3. IMPACT RESISTANT
4. CAN RETAIN THEIR SHAPE
5. EASY TO INSTALL
6. LOW MAINTENANCE



### 3D PRINTED THERMOPLASTIC FORMWORK

#### ADVANTAGES

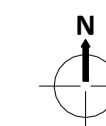
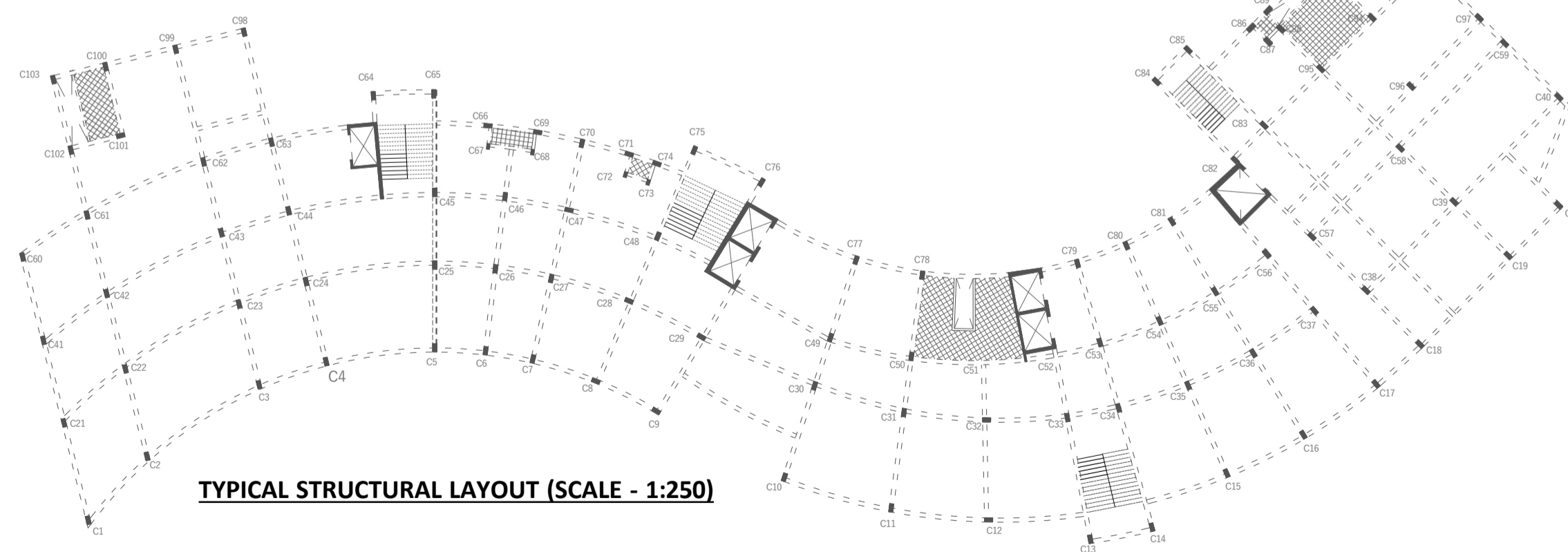
1. SPEEDY CONSTRUCTION
2. DESIGN FLEXIBILITY
3. ENHANCED STRUCTURAL STRENGTH
4. ABILITY FOR ON-SITE REPAIR AND MAINTENANCE



### HDPE - FOR COVERING OF (HIGH DENSITY POLYETHYLENE)

#### ADVANTAGES

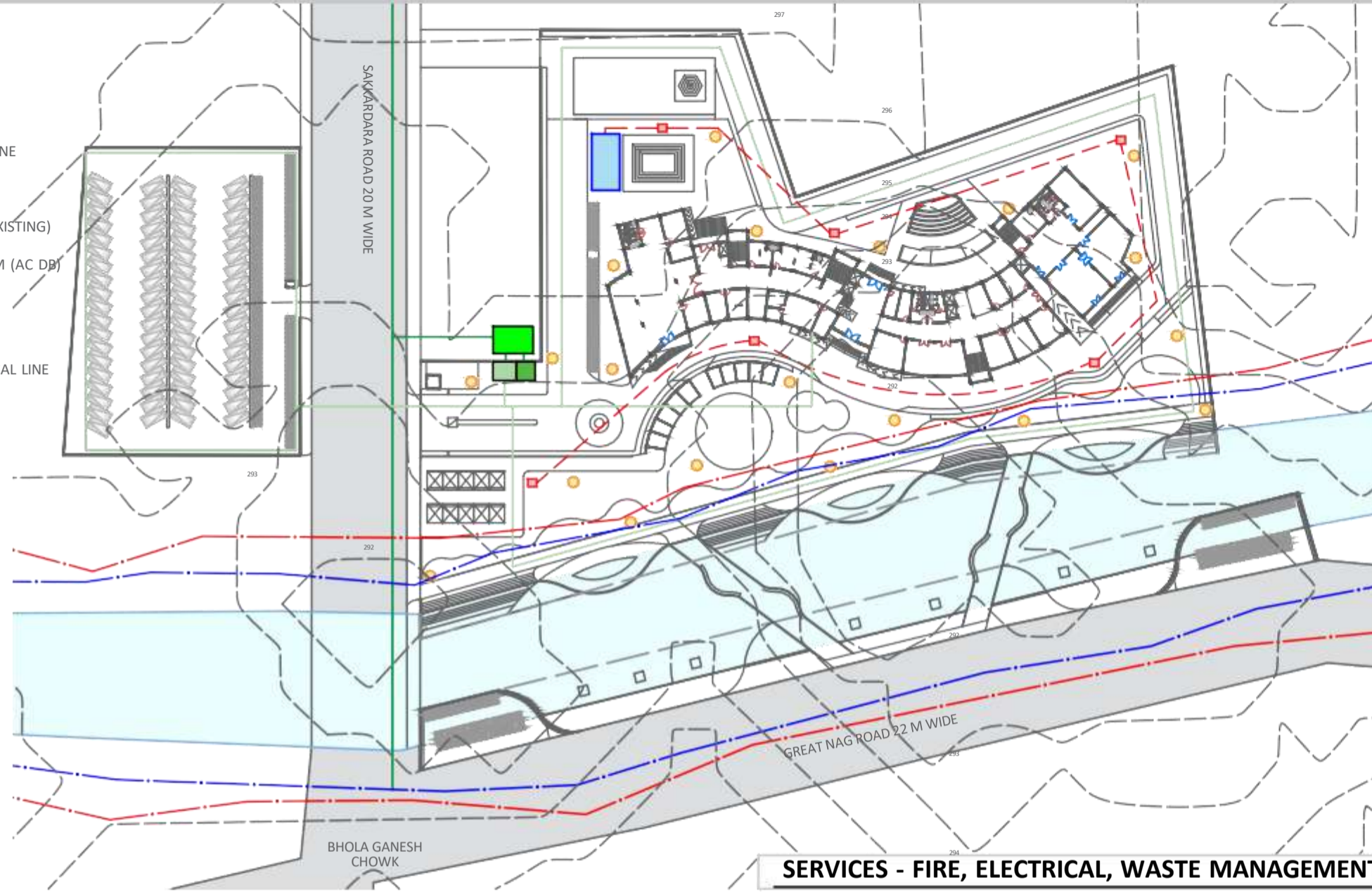
1. LOW COST
2. IMPACT RESISTANT FROM -40 °C TO 90 °C
3. MOISTURE RESISTANCE
4. GOOD CHEMICAL RESISTANCE
5. READILY PROCESSED BY ALL THERMOPLASTIC METHODS



# SERVICE LAYOUT & DETAILS

## LEGENDS:

- FIRE EMERGENCY**
  - FIRE HYDRANT
  - FIRE WATER PIPELINE
- ELECTRICAL SERVICE**
  - TRANSFORMER (EXISTING)
  - GENERATOR ROOM (AC DB)
  - METER ROOM
  - ELECTRICAL MAIN
  - PRIMARY ELECTRICAL LINE
- WASTE MANAGEMENT**
  - GARBAGE BIN

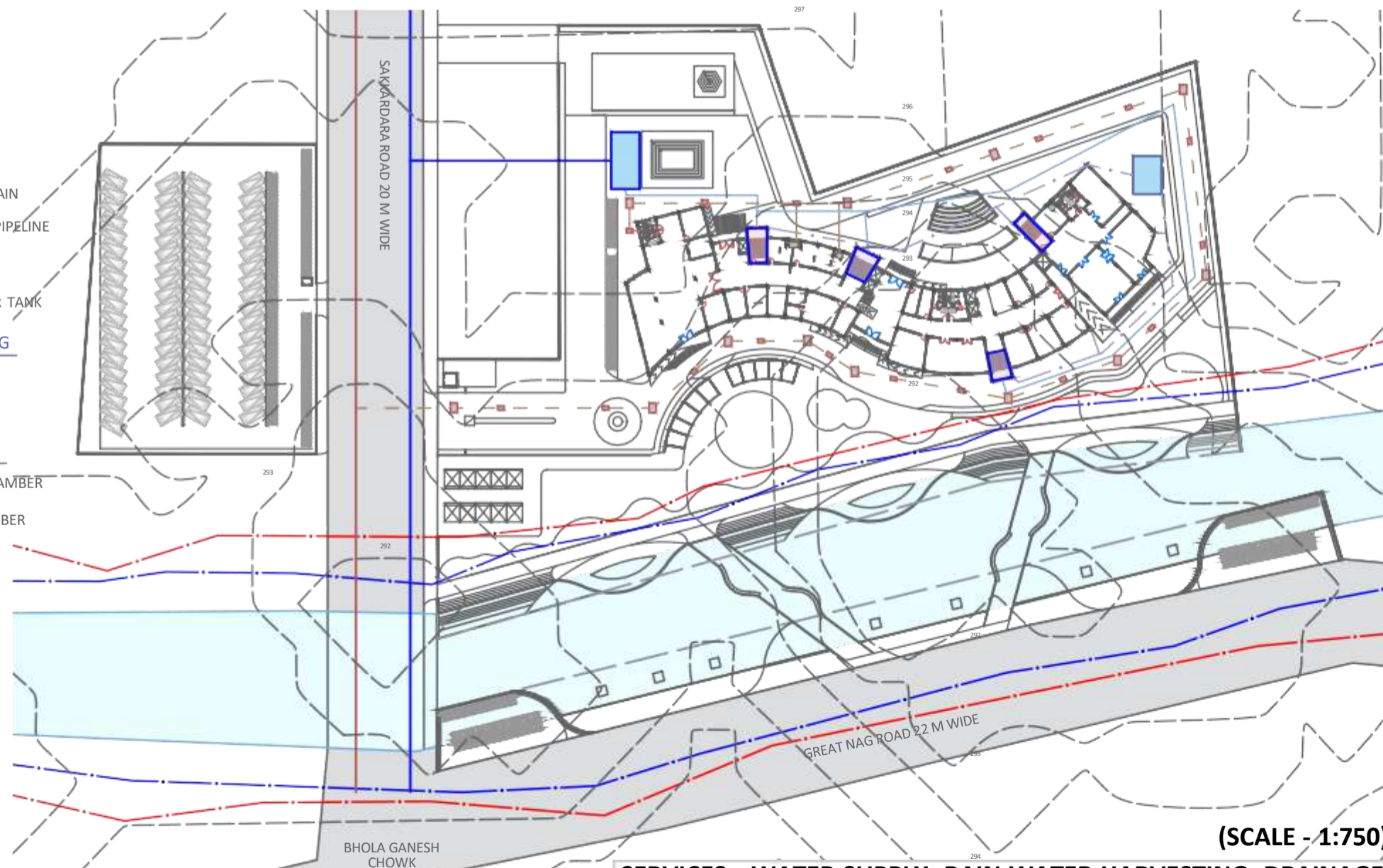


SERVICES - FIRE, ELECTRICAL, WASTE MANAGEMENT

(SCALE - 1:750)

## LEGENDS:

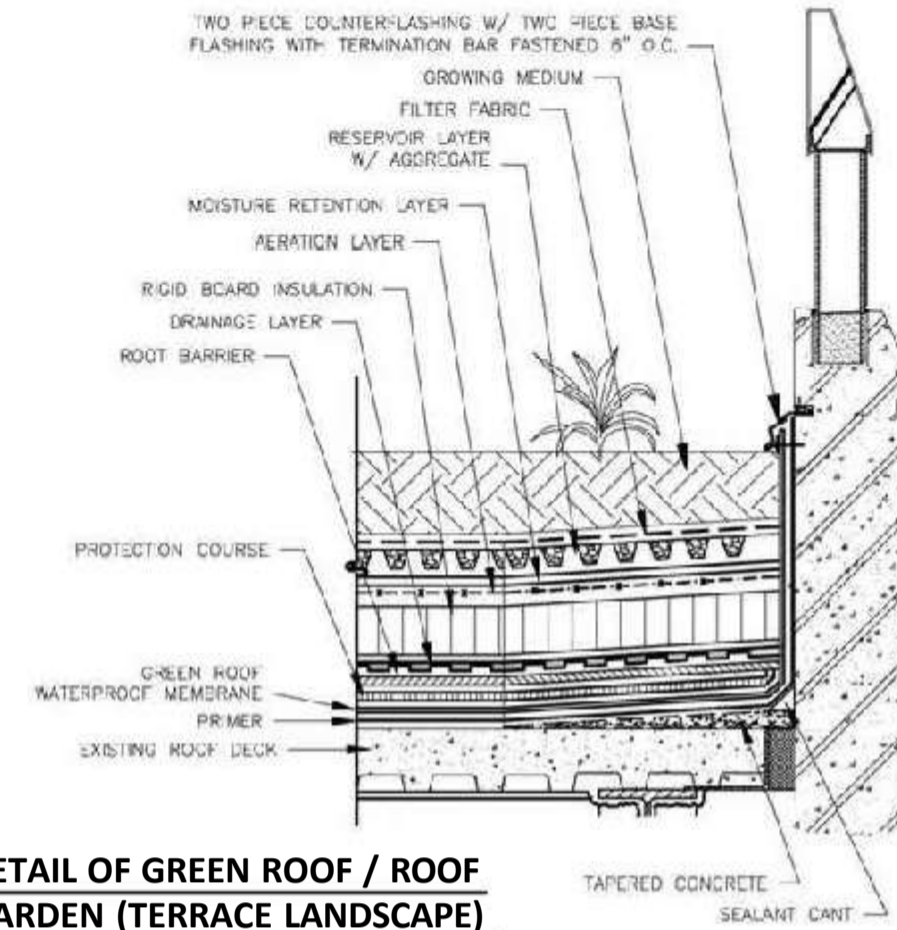
- WATER SUPPLY**
  - UGWT
  - WATER SUPPLY MAIN
  - PRIMARY WATER PIPELINE
  - FIRE TANK
  - OVERHEAD WATER TANK
- RAIN WATER HARVESTING**
  - RWH TANK
  - WATER PIPELINE
- DRAINAGE (SANITATION)**
  - INTERCEPTING CHAMBER
  - INSPECTION CHAMBER
  - DRAINAGE MAIN
  - DRAINAGE LINE



SERVICES - WATER SUPPLY, RAIN WATER HARVESTING, DRAINAGE

(SCALE - 1:750)

## DETAILS (MATERIAL EXPLORATION)



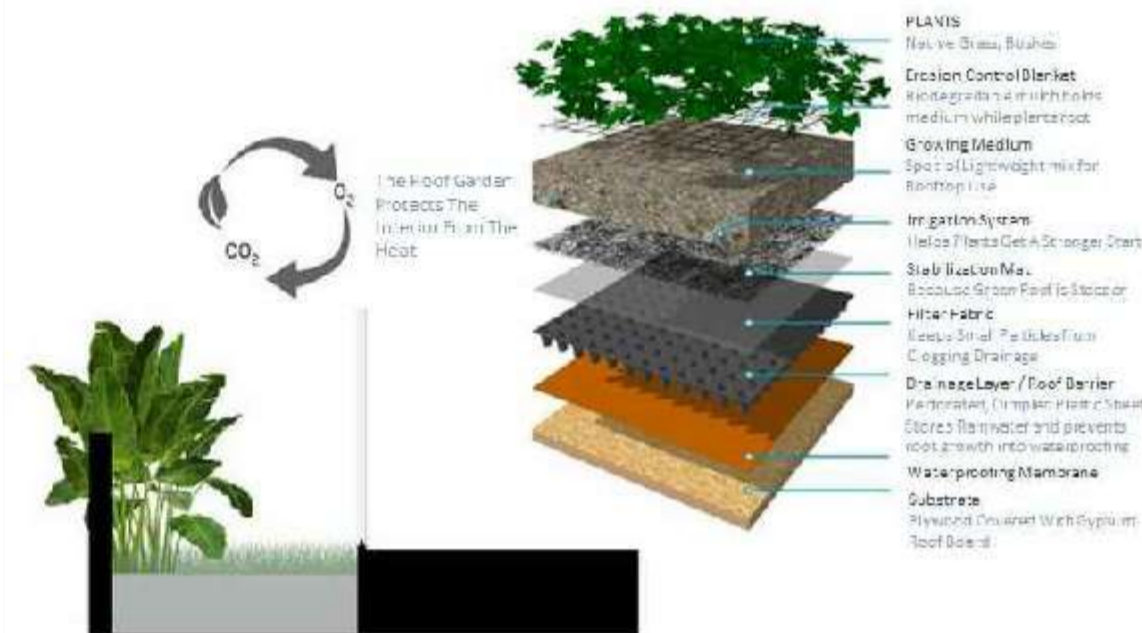
### GREEN ROOF

A GREEN ROOF OR LIVING ROOF IS A ROOF OF A BUILDING THAT IS PARTIALLY OR COMPLETELY COVERED WITH VEGETATION AND A GROWING MEDIUM, PLANTED OVER A WATERPROOFING MEMBRANE.

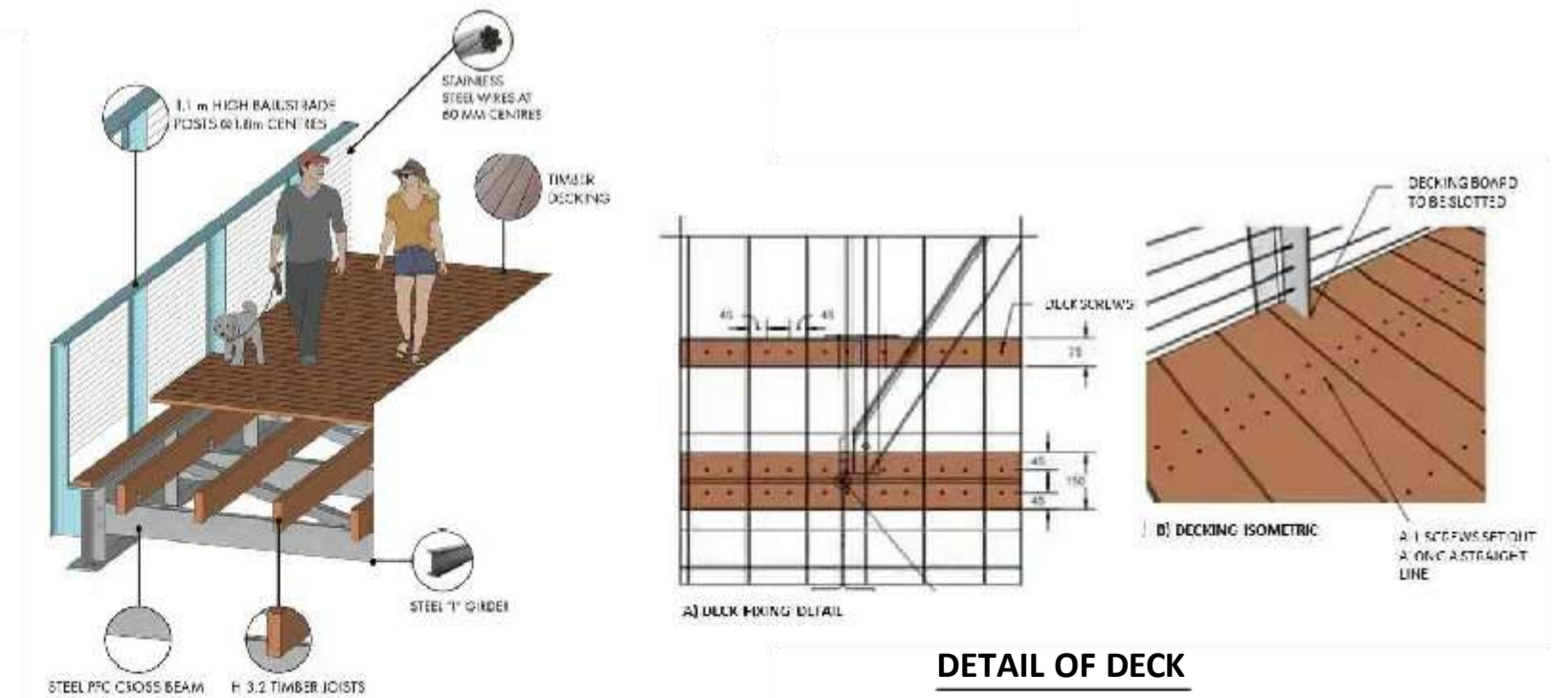
### GENERALLY HAVE 5 LAYERS

1. A **ROOT BARRIER** PREVENTS ROOTS FROM PENETRATING INTO THE BUILDING.
2. A **PROTECTION MAT** HELPS TO MINIMIZE PUNCTURES.
3. THE **DRAINAGE LAYER** ALLOWS HEAVY RAIN TO RUN OFF TO A PERIMETER DRAIN YET STILL REMAINS MOISTURE FOR DRY PERIODS.
4. A **FILTER SHEET** STOPS FINE PARTICLES FROM CLOGGING THE DRAINAGE LAYER, AND THE GROWING MEDIUM TYPICALLY ENGINEERED MATERIAL.
5. AND THE **SOIL** PROVIDES NUTRIENTS FOR PLANTS ABOVE.

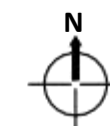
### DETAIL OF GREEN ROOF / ROOF GARDEN (TERRACE LANDSCAPE)



ROOF GARDEN



DETAIL OF DECK



# LANDSCAPE DETAILS & VIEWS

## SOFT-SCAPE

	<b>EXISTING TREES</b> MANGO, BANYAN, IMLI, PEEPAL & BABOOL
	
	<b>RELOCATED TREES</b> SMALL TREES – THOSE WHO HAVE LESS FOLIAGE
	
	<b>PLANTED TREES &amp; PLANTS</b> GULMOHAR TREE (DELONIX REGIA) AESTHETICS & FRAGRANCE
	
	ASHOKA TREE (SARACA ASOCA)
	
	PALM TREE (ARECACEAE)
	
	NEEM TREE (AZADIRACHTA INDICA)
	
	CHAMPA TREE (MAGNOLIA CHAMPACA) AESTHETICS & FRAGRANCE
	
	MARIGOLD (TAGETES) AESTHETICS & FRAGRANCE
	
	SHEVANTI (CHRYSANTHEMUM) AESTHETICS & FRAGRANCE
	
	BOXWOOD (BOXUS SEMPERVIRENS)
	

## HARD-SCAPE

	<b>GREEN PAVERS</b> • LOW MAINTENANCE • RELATIVELY LOW COSTS • ESTABLISH A GREEN STREET SCENE • GREENERY ENSURES THAT SOME OF THE WATER EVAPORATES WHILE SOME OF IT IS ABSORBED
	<b>BRICK PAVER</b> • LOW MAINTENANCE & DURABLE • RELATIVELY LOW COSTS • ECO-FRIENDLY • NON-SLIPPERY SURFACE • SUITABLE FOR AREAS WITH HIGH TRAFFIC
	<b>PORCELIN PAVER BLOCK – FOR TERRACE</b> • LOW MAINTENANCE • DURABLE • ECO-FRIENDLY & AESTHETICAL • WATER RESISTANCE • SUITABLE FOR AREAS WITH HIGH TRAFFIC
	<b>DECKING BOARD FOR DECK</b> • DURABLE • STRENGTH & SAFETY • ECO-FRIENDLY & AESTHETICAL • LONG WEARING • SUITABLE FOR AREAS WITH HIGH TRAFFIC



MAIN PARKING AREA



VITTHAL RUKMINI TEMPLE WITH KUND



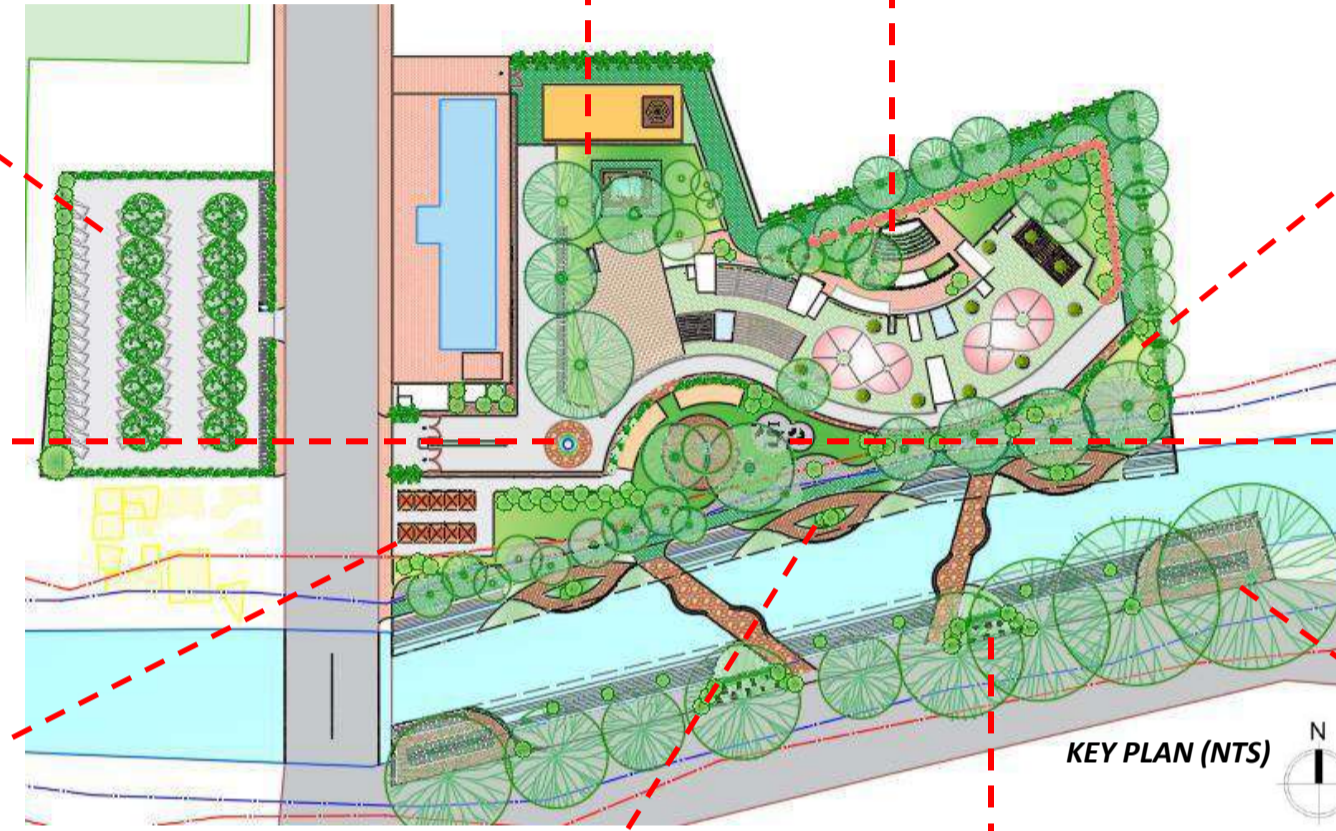
OPEN AIR AMPHITHEATRE



SEATING SPACE & CHABUTRA



MAIN ENTRANCE – INSIDE VIEW



KEY PLAN (NTS)



KIDS'S PLAY AREA AND FOOD COURT



MARKET – TEMPORARY STRUCTURE



DECK, BRIDGE, AND GHAT



OPEN AIR GYM



DECK PARKING



SOUTH SIDE VIEW OF THE PROJECT



NORTH SIDE VIEW OF THE PROJECT

- a. (Mudholkar, 2018)
- b. (Gole, 2014)
- c. (Patel, 2020)
- d. (Simons et al., 2023)
- e. (Sangode et al., 2019)
- f. (Paul & Rasekar, 2014)

- [1] <https://www.wikipedia.org/>
- [2] <https://theprint.in/india/toxic-foam-seen-in-indrayani-river-in-pune-locals-express-concern/1338931/>
- [3] <https://www.atlasobscura.com/places/ghorpade-ghat>
- [4] <https://timesofindia.indiatimes.com/>
- [5] (<https://kevinstandagephotography.wordpress.com/2023/05/03/ghorpade-ghat-punes-abandoned-heritage/>)
- [6] <https://sabarmatiriverfront.com/srfdcl-master-plan/>
- [7] <https://nilaa-urban.org/Patna-Riverfront-Revitalization-2014-20>
- [8] <https://deeptrootsdesign.net/portfolio/futala-talab-nagpur/>
- [9] <https://thinkmatter.in/2021/07/02/modern-heritage-jawahar-kala-kendra-jaipur/>

**CHAPTER 11 – ANNEXURE**

## **Rejuvenating River Ghats for Sustainable Development - Establishing the Land-Water Connect”**

< Janhavi Nimje><sup>1</sup>, <Prof. Mukta Latkar Talwalkar><sup>2</sup>,

*Janhavi Nimje*

*Final Year Student, Bharati Vidyapeeth (Deemed to be University) College of Architecture, Pune*  
*[nimjan2001@gmail.com](mailto:nimjan2001@gmail.com), Bharati Vihar, Pune.*  
*+918319054647*

*Ar. Mukta Latkar Talwalkar*

*Professor, Bharati Vidyapeeth (Deemed to be University) College of Architecture, Pune*  
*and PhD Scholar, BM University, Surat.*  
*[Mukta.Latkar@bharativedyapeeth.edu](mailto:Mukta.Latkar@bharativedyapeeth.edu), Kothrud, Pune.*  
*+917798244110*

**Abstract:** The impacts of modernization have led to a neglect of the natural environment resulting in the deterioration of river ecosystems and their associated cultural and spiritual significance in many societies. This paper explores the historical and cultural significance of ghats, big and small, known and unknown, their traditional role, modernisation of the cities, redundancy of the ghats in the changed urban scenario leading to the steps taken to modernise riverfronts, and the subsequent disconnect between people, communities and their cultural disconnect with the rivers that flowed through the human habitations. The creation of ghats along rivers was initially an expression of cultural coexistence, spiritual reverence and served as vital public spaces active with communal, cultural, economic and physical daily and religious activities. With urbanisation and industrialization, these ghats have faced neglect and deterioration, leading to a disconnection of the human association with water. As a result, the traditional, cultural and spiritual significance of these sites have been eroded, impacting the well-being of communities and the health of river ecosystems. The paper attempts to examine sustainable approaches to rejuvenating ghats and re-establishing the historical and cultural link between societies and settlements and rivers. It discusses the requirement and importance for holistic rejuvenation strategies that incorporate ecological restoration, cultural preservation, and community engagement. These strategies involve community-led restoration efforts, and the integration of traditional knowledge with modern technology. By revitalizing ghats through sustainable approaches, communities can once again form a meaningful association with their rivers, addressing the adverse impacts of urbanisation and promoting a healthier and more holistic relationship between people and their natural environments.

**Keywords:** River Ghats, Revitalisation, Restoration, River Ecosystem, Urban Transformation

### **Introduction**

Water is a way of life and it remains intervened with our lives in more ways than one even in Contemporary urban scenarios. The success of River Valley Civilisations established a unique bond of Human settlements and rivers passing through or along, as the geography permitted. Over the period of time, with the advancement of a civilised society, a large number of activities evolved in association to the river duly acknowledging its significance. Access to the river waters from surrounding lands was thus a very important consideration and a necessity for all the activities.

The designing and construction of Ghats for all possible social – cultural – religious reasons added a completely new perspective to the treatment of this transition, between the land and the river, between the water edge and the waters. Access to the flowing lifeline was ensured through the ‘Ghats’, the alternating construction of steps and landings leading to the waters from land.

In ancient times, river Ghats held significant cultural, social, religious, and practical importance in many civilizations, particularly in regions where rivers played a crucial role in daily life. River Ghats were often considered sacred places in many cultures. They served as sites for religious rituals, ceremonies, and offerings. In Hinduism, for example, Ghats along rivers like the Ganges are believed to have purifying properties, and people would bathe in the river to cleanse themselves of sins. These Ghats were also where cremation

ceremonies took place, symbolizing the cycle of life and death.

The River Ghats were integral parts of the historical and cultural heritage of various civilizations. They have witnessed centuries of human activities, traditions, and rituals, preserving the collective memory of communities living along the rivers. Many ancient Ghats continue to be revered as symbols of tradition and continuity, attracting pilgrims, tourists, and researchers interested in exploring their rich heritage.

The River Ghats were important social hubs where people gathered for various activities. They served as meeting points for communities, providing spaces for social interactions, trade, and commerce. Along with religious activities, Ghats were often venues for festivals, markets, and cultural events, fostering a sense of community and connectivity. They also played a crucial role for practical purposes such as bathing, washing clothes, and fetching water. They provided access to the river for daily activities, ensuring a reliable water source for communities living along the riverbanks. Additionally, Ghats served as docking points for boats and ferries, facilitating transportation and trade along river routes.

Overall, river Ghats played multifaceted roles in ancient times, serving as centres of religious devotion, social interaction, economic activity, and architectural splendour, while also embodying the historical and cultural legacies of the civilizations that thrived along the riverbanks.

**Rejuvenating River Ghats for Sustainable Development - Establishing the Land-Water Connect”**

Rivers in Urban Areas today:

In modern times, several challenges have emerged that have impacted Rivers and their Ghats in various ways and made them irrelevant infrastructure. The speedy transformation of the cultural society to a cosmopolitan society and the drastic pace of urbanisation have completely changed the lifestyle, infrastructure facilities and the standard of living. This has completely changed the perspective of looking at the river, reducing it an obsolete geographical asset. The drying and channelization of the river have also ripped them off from their local beauty. Misuse, bad maintenance, changed concepts of open spaces have made these amazing manifestations of architectural heritage into ignored landuses in Urban cities.

Addressing these issues requires concerted efforts from all stakeholders like governments, communities, planners and users to ensure the preservation, restoration, and sustainable management of river Ghats. It is very important that these Urban liabilities be converted to Urban assets for the citizens of the city. Most of the cities with rivers have ghats constructed on them however they are not in use due to the status of the river. Revitalising the ghats and the areas around them can play a major role in reviving the Land water connect in the urban areas also enhancing the quality of the rivers passing through the cities.

This may involve implementing pollution control measures, enforcing regulations to prevent encroachment, investing in infrastructure maintenance and repair, promoting community engagement and awareness, and integrating climate resilience strategies into riverbank management plans.



**Krishna Ghat, Wai**

### **What is Revitalisation?**

Revitalization refers to the process of restoring vitality, energy, or vigour to an area, organisation, system, community, or environment that has experienced decline or stagnation. This typically involves initiatives and strategies aimed at enhancing and renewing the economic, social, cultural, or physical aspects of the target area or entity. Revitalization efforts often encompass revitalising urban neighbourhoods, business districts, historic areas, or natural landscapes through urban renewal, economic development, community engagement, and other revitalization tactics. The goal of revitalization is to stimulate growth, improve

liveability, and promote sustainability, ultimately leading to a restored and thriving condition.

### **What has changed with the rivers over a period of time ?**

One of the most significant problems facing the Urban Rivers and the River Ghats in modern times

- The role of the River in the city as ‘Giver’ has changed to ‘Taker’ with the modernisation and urbanisation of cities.
- The unbalanced and haphazard growth have pushed the rivers into the backyards of the development. The rivers have fallen to unuse and misuse over the years, they no longer being the source of daily waters visited to be fetched.
- Industrial waste, agricultural runoff, untreated sewage, and plastic pollution are being emptied into the rivers severely degrading water quality
- River ecosystems are fast being deleted and destroyed with no regards to its consequence.
- The Spiritual and aesthetic appeal of the Ghats is fast diminishing, making them less inviting for religious rituals and socio-cultural activities.
- Access to the waters by ghats are put to misuse deterring people's connections to the flowing waters further adding to the grim situation.

### **Situation of River Ghats in an Urban Area**

Urban river ghats encounter a multitude of concerns arising from fast urbanisation and inadequate infrastructure. One major problem is pollution, which puts human and aquatic life at risk due to the frequent contamination of these water bodies by sewage, industrial runoff, and urban runoff. The capacity of ghats to hold ceremonies, meetings, and leisure activities is diminished due to encroachment and illegal construction along the riverbanks. Furthermore, improper waste management makes littering and rubbish buildup worse, which worsens the ghats' aesthetic and environmental qualities. Defecation in the open is a result of inadequate sanitation facilities, which further contaminates the surrounding water and environment.

River ghats are also affected by erosion and sedimentation, resulting in structural damage and instability. These problems are made worse by climate change, which alters water flow patterns and increases flooding. Moreover, the degradation of ghats is accelerated by neglect and poor upkeep, diminishing their historical and cultural relevance.

### **1. Pollution in the river - Indrayani River**

Alandi is located on the bank of the Indrayani River, 18.8 km from Khed Taluka of Pune District, near the northern edge of the city of Pune in the state of Maharashtra, India. The town is popular as a place of pilgrimage and the resting place of the 13th century Marathi saint Sant Dnyaneshwar.

Alandi. Every year, the Paduka (symbolic sandals) of Dnyaneshwar go on a 21-day Palkhi from Alandi to reach Pandharpur on Ashadhi Ekadashi (June or July in the Gregorian calendar). The Palkhi procession is joined by thousands of Varkari devotees for the 150 km journey.

The Indrayani River originates in Kurvande village near Lonavla, a hill station in the Sahyadri mountains of Maharashtra, India. Fed by rain, it flows east from there to meet the Bhima river, through the Hindu pilgrimage centers of Dehu and Alandi. It follows a course mostly north of the city of Pune. It is revered as a holy river and is associated with religious figures such as Sant Tukaram and

Dnyaneshwar. Originating from the Western Ghats, River Indrayani, travels a total distance of 92.2 km, of which 20.6 km falls in the city of Pimpri Chinchwad, formerly a fringe area of Pune, and now a rapidly urbanising city.

There are 6 ghats in Alandi - Indrayani River Ghat, Alandi Dhobi Ghat, Pundalik Ghat, Dashkriya Ghat, Vishwa Shanti Kendra Ghat and Shree Saint Dnyaneshwar temple Ghat.[1]

“The main cause of pollution of Indrayani river ghat is the mixing of treated, semi-treated and untreated domestic sewage from local bodies released into the Indrayani river through various drains, The toxic foam is the result of untreated effluents released by industries. Due to which fish dies off in the river over the past few years. Bathing **ghat** on banks of the **Indrayani** river. People bring ashes of relatives to be ceremoniously immer. The locals further alleged that due to pollution they are forced to stop their daily rituals as it is causing them many skin diseases.” [2]



**Present appearances of Indrayani River Ghat, Alandi**

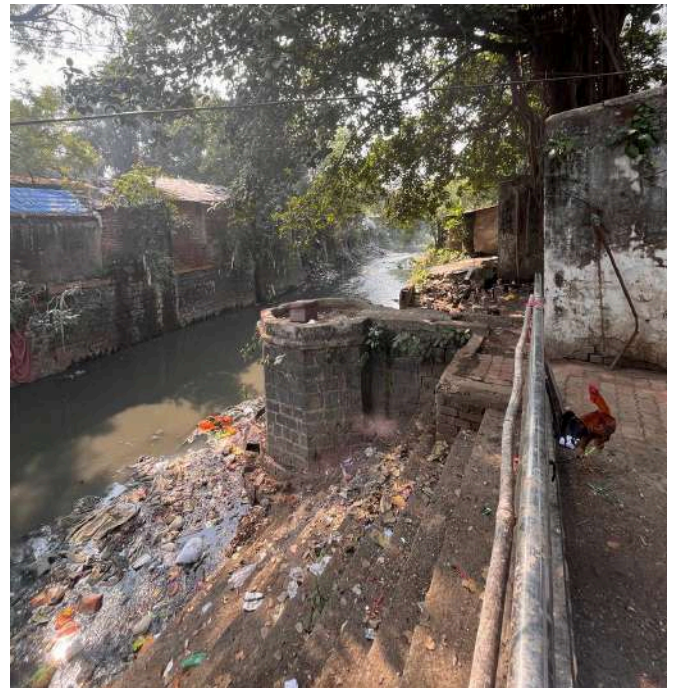
The pollution in the Indrayani River underscores a critical urban issue. Rapid urbanisation has led to unchecked industrial discharge, sewage, and waste dumping into the river, severely contaminating its waters. This not only threatens aquatic life but also jeopardises the health and well-being of urban communities dependent on the river for various purposes.

## **2. Urbanisation and encroachment, Garbage and Filthy areas - Nag River, Nagpur**

Nagpur is the third-largest city of the Indian state of Maharashtra after Mumbai and Pune. Known as the "Orange City". It is also called the Tiger Capital of India or the Tiger Gateway of India as many tiger reserves are located in and around the city, Nagpur is the 13th largest city in India by population.

Nag River acts as the storm water drainage for west (part), south, central & east Nagpur. Total length of Nag River is 17.00 Km up to the city limit. Its width ranges from 12 to 40 m and depth varies from 2 to 4.5 m. Total length of Nag River up to the confluence with Kanhan River at Agargaon is about 68 Km.

Nag River is polluted due to untreated sewage, industrial effluent and indiscriminate solid waste. According to MPCB river water quality is not highly polluted and can sustain fishes etc.(Mudholkar, 2018)



**Present appearance of Sangam Ghat, Nagpur**

“There are no such holy ghats in Nagpur along the Nag river. Although, the ghats which are present in the city are only Dahan Ghat, they are - Besa Ghat and Nara Ghat.

One of the holy ghat in Nagpur is Sangam Ghat near Sangameshwar temple. With increase in human settlement along the banks and many sewer lines discharging in it, Nag River is polluted to a dangerous extent. Encroachments on the banks have further complicated the situation.” [4]

The Sangam Chawl in Sitabuldi is home to some of the city's heritage temples, including over 200 years old structures like the Karthikeya, Shiva, Hanuman and Krishna temples. Originally owned by King Bhosale, the land was given to the late Congress member Binu Pandey for upkeep. However, some of them have become hangout spots for antisocial elements while some have been turned into residences (illegally) by occupants over the last 3 generations. In earlier times, worship was the only reason people visited the temples. It is now difficult to maintain the property free of antisocial characters. (In an interview with temples priest Mr. Tiwari)

The pollution in Nag River epitomises an acute urban concern. The river's ecology has been seriously harmed by uncontrolled industrial effluents, sewage discharge, and trash disposal brought on by rapid urban expansion. This represents structural environmental mismanagement in urban areas and endangers the livelihoods and health of urban residents who depend on the river.

## **3. Loss of cultural activity / Depletion of Sacred Places**

### **Krishna river Wai**

Wai is a town in Satara district of Maharashtra state in India. Located on the Krishna River, Wai was a prominent town during the Peshwa era.

The river, also called Krishnaveni, is 1,400 kilometres long and its length in Maharashtra is 282 kilometres. It is a major source of irrigation in the Indian states of Maharashtra, Karnataka, Telangana and Andhra Pradesh.



Krishnamai festival at Wai, Maharashtra

The town of Wai continues its river festival, which is unique for its spatial richness. It survives as a continuous cultural tradition in which both the tangible and the intangible can be experienced. The festival converts a semi-private event, celebrated in the house with relatives and neighbours into an urban festival aimed both at devotion and at community bonding.

The Krishnamai festival began when Shendye Shāstri of Wai prayed to the Krishna River for Chhatrapati Shivaji Maharaj's success when warlord Afzal Khan came out from Wai to attempt to fight him. Every ghat celebrates it for four to eight days.

With the passage of time, however, the connection between the river and its festival has weakened. The river has become a flowing sewer, carrying wastewater from the town. Lack of sewage treatment and regular maintenance has made the river a stinking and stagnant trickle of water. (Sahasrabudhe & Kashyap, 2016)



**Present appearances of Ganpati Ghat, Wai**

The pollution in the Krishna River at Wai underscores a pressing urban challenge. The river has been contaminated by rubbish dumping, sewage discharge, as a result of uncontrolled urban growth. This demonstrates urban environmental mismanagement by threatening the ecosystem's health and the quality of the water.

#### **Ganapati Immersion into the River**

Ganpati immersion rituals, marked by the release of idols into water bodies, contribute significantly to pollution. The materials used in idol construction, such as plaster of Paris and toxic paints, contaminate aquatic ecosystems. Additionally, overcrowding at sacred sites during these events leads to environmental degradation and threatens the sanctity of these revered places.

#### **4. Changed land uses on the river banks and Channelised waters - Mutha river, Pune**

“Pune is a sprawling city in the western Indian state of Maharashtra. It was once the base of the Peshwas (prime ministers) of the Maratha Empire, which lasted from 1674 to 1818.

The Mutha River is a river in western Maharashtra, India. It arises in the Western Ghats and flows eastward until it merges with the Mula River in the city of Pune. It has been dammed twice, first at the Panshet Dam, used as a source of

drinking water and irrigation for Pune city. The length of Mutha River is 10.4 kms.

The civic body has constructed many cement river banks, which have disturbed the natural flow of the river. The pollution in the river is also due to mixing non-treated sewage water into the river basin. Also, many industrial units are diverting their pollutants to water bodies, which increases river pollution.” [1]

The pollution in the Mutha River epitomizes a critical urban dilemma. Uncontrolled urbanization has resulted in sewage overflow, and indiscriminate waste disposal, severely contaminating the river. This endangers human as well as aquatic life, compromises water quality, and threatens the health of urban residents reliant on the river.

The channelization of rivers has brought about significant alterations in land use along their banks. Once meandering natural watercourses, now confined within artificial channels, have spurred intensive human activities. Agricultural lands have expanded closer to the riverbanks, benefiting from controlled irrigation. In earlier days river ghats had temple premises but now urbanization has flourished with the assurance of flood control, leading to the establishment of residential and commercial areas along with vehicular roads besides the river. However, this alteration often disrupts natural habitats as well as deplete water quality, increases flood risk downstream, and exacerbates erosion. Consequently, the delicate balance between human needs and environmental sustainability demands meticulous planning and management of land use along channelized river corridors.

#### **5. Ignored Heritage - Ghorpade ghat, Pune**

In some cases, river Ghats have suffered from neglect and lack of maintenance by authorities. As a result, essential infrastructure such as steps, platforms, and bathing areas may fall into disrepair, making it difficult for people to access the river for religious or practical purposes. Additionally, inadequate waste management and sanitation facilities can further contribute to the degradation of Ghats.

Along the banks of the Mutha river, one can see an old, almost fort-like stone structure on the riverbank. It is flanked by four bastions, a nagarkhana (a drum chamber), two circular rooms, and a flight of wide steps leading down toward the river. “Ghorpade Ghat is said to have been built by Daultrao Ghorpade, a descendant of Peshwa Sardar Yashwantrao Ghorpade, in 1831 CE. Situated on the north bank of the Mutha River and immediately east of Chhatrapati Shivaji Maharaj Bridge, Ghorpade Ghat is a contender for Pune's least cared for heritage structure. There are foundations of two temples at this site. One of them is said to be a Mahadeva temple, while the other one remains unidentified.” [3]

“A significant part of Ghorpade Ghat was destroyed by the great flood of 1961, when the earthen-built Panshet Dam situated 50km south-west of Pune broke its banks on the 12th July.” [5]



**Present Appearance of Ghorpade Ghat, Pune**

Ghorpade Ghat resides on private land, and permission for any works here was refused by the Irrigation Department. No permission has been granted to erect just a simple information board here either. [5]

Neglecting Ghorpade Ghat in Pune River exemplifies a significant urban issue. The lack of maintenance, waste management, and sanitation infrastructure leads to environmental degradation and health hazards. It reflects systemic neglect of urban spaces, highlighting the urgent need for comprehensive urban planning and management to address such pressing issues effectively.

#### **Why have the River ghats lost its relevance?**

1. Changing times changed the role and status of the river in the lives of the citizens. Piped water supply at individual homes reduced the daily interaction of the people with the river and its waters.
2. With most of the rivers sources dammed for piped urban supply, the rivers lost their waters and remained mere streams crossing the urban cities.
3. The cultural landscape of this interface, the ghats, was always with a background of temples. Today the role of these temples in the society have been changed directly affecting the usage and significance of the ghats. Cultural festivals and rituals associated with rivers are fast being forgotten.
4. People are not keen on accessing the polluted waters of the river .
5. Ignorance to the importance and value of remains, their occupation by miscreants and beggars, and Absence of illumination post sunset deter people to visit the areas.

#### **Some developments in other cities in India**

##### **Sabarmati Riverfront by Dr. Bimal Patel**

The project aims to provide Ahmedabad with a meaningful waterfront environment along the banks of the Sabarmati river and to redefine an identity of Ahmedabad around the river. The project has reconnected the city with the river and has positively transformed the neglected aspects of the riverfront. Total area of the development is 506 acres.

They have provided various Amenity spaces like Access to Ghats, Exhibition centre, Heritage plaza, Green pockets, Parks, Sports Complex, Event Ground, Urban forest etc.

The Sabarmati Riverfront Development Project transformed a neglected stretch of the Sabarmati River in Ahmedabad, India, into a vibrant urban space. Completed in 2012, it revitalized the riverbanks with parks, promenades, and cultural amenities, fostering tourism and recreation. The project's success lies in its integration of environmental restoration with urban development, revitalizing the cityscape.

##### **Patna Revitalisation by Ar. Nishant lall**

A large part of city has turned its back towards the Ganges resulting misuse of river edge for dumping and waste accumulation. The traditional ghats along the river are also dilapidated and so are a large part of govt land. The scheme plans to integrate these unused land by connecting all the 27 ghats along the 7km stretch and provide a network of urban parks and walkways to improve access to the ghats.

The design components would maximize and optimize the space usage available on the river edge. The proposed promenade has been designed to retrofit the existing boundary conditions with ghats and connecting landscape creating access to river wherever possible. The Patna Riverfront Development Project rejuvenated the banks of the Ganges River in Patna, Bihar. Launched in 2016, it aimed to enhance the city's landscape with parks, walkways, and recreational spaces. By leveraging the river's potential, the project revitalized tourism, improved flood management, and provided a new urban focal point for residents.

##### **Godavari Riverfront Development**

Godavari is the second longest river in India after the river Ganges. It is popularly known as "Dakshin Ganga". The primary objective of the riverfront development was to connect the city to the river, make it more accessible and usable by the residents.

The master plan divided the 5 kms on north and south bank into five zones each. These zones identified the assets and constraints for each zone to generate a proposed set of components, which were unique and yet tied in the complete waterfront together.

The first component to achieve a unified waterfront was the riverfront road for the complete 5 km stretch, along with parking and public amenities. The Master Plan focuses on regeneration of the river. The North Bank will be integrated with the existing urban fabric while the less developed South Bank is proposed as an eco-park. [12]

##### **Revitalization of Dravyawati River, Jaipur**

Dravyawati River, which is also known as "Amaanishaah naala", has lost its flow and purity of water in past couple of decades. Rapid urbanization in the last 3 - 4 decades coupled with rampant encroachments in the river area and its catchment areas along with the dumping of industrial waste water and solid waste into Dravyawati converted this once pristine flowing river to a Nallah.

This project aims to reduce pollution, treat 170 million litres of sewerage a day, create Green Spaces, Social Spaces, Cycle tracks, Jogging tracks along its banks, reduce the threat of floods, create employment, and transform Jaipur into a clean Smart City. [11]

### Rejuvenating the River Ghats

It is important that all stakeholders are brought to the rivers and river ghats regularly by completely transforming the areas which shall welcome people for various recreational activities. It is important that people use the facilities and benefit out of the same to be able to revisit the areas again and again initiating and integrating change would be the first step towards this Land-water connection.

It is very important and very vital to change the “River in the backyard’ perspective to the ‘Waters in the front court’ attitude” to change the status and significance of rivers in the urban cities. This can be achieved by

1. Encouraging the visual - physical- cultural linkage of the city areas with the river spans.
2. Thoughtfully developing the river edges with environmental and ecological sensitiveness.
3. Revive the cultural - religious and social ethos of the river and the river edges.
4. Establish facilities and infrastructure to treat the water and ensure no pollution levels of the flowing waters.
5. Design amenities and facilities for all ages to encourage vibrant interaction .

The planning intervention and the architectural inserts should not just ‘beautify’ the river banks but create and sensitise the people to the age old relationship towards the flowing waters and the rivers. The planning and Design insert should create a sense of bonding with the sensitive river bank. It is important that awareness about the significance of the natural resource is created as an asset to the city by making the people repeatedly frequent the area to feel, to experience and to interact in the valuable natural spaces rich with environmental benefits, and adhering to vernacular designs.

Revitalising ghats presents an opportunity for urban renewal. Through collaborative efforts, they can be restored with sturdy infrastructure, waste management systems, and green spaces.

Ghats are a series of steps that go to the water and are constructed parallel to the river's flow. They are built to direct water flow, preserve soil, define and stabilise riverbanks, allow access to rivers, and shield communities from flooding. Constructed within the riverine environment, the Ghats enhance the everlasting bond among environment, culture, humanity, and water.



**Chandi Ghat of the Patna Riverfront Development, Patna**

Along the river ghat one can create Public Amenity and Recreational spaces for e.g. landscaped areas that reinforce the bond between nature, culture, and people also contributing in unifying force, washing away societal divisions and strengthening a sense of shared humanity.



**Interaction Space : Ghat of the Patna Riverfront Development, Patna**

Riverfront developments can be climate passive by incorporating green infrastructure like vegetated buffers, wetlands, and permeable surfaces, mitigating flooding and reducing heat island effects. Passive design principles such as orientation, natural ventilation, and shading can optimize energy efficiency, minimizing carbon footprint and enhancing resilience to climate change impacts, prioritize water care by implementing sustainable practices such as stormwater management systems, wetland restoration, and erosion control measures.



**Chicago Riverfront**

Based on factors such as climate and geography, local resource scarcity, and personal histories, riverscapes became a distinctive form of urban architecture for every community. They have developed into locations of human community along the water's edge in response to social, religious, and spiritual requirements also it provides provision for community interaction for different user group.



**Yoga practice in the morning**



**\Chhat Pooja at Benaras**

By embracing bioengineering techniques, erosion control measures, wastewater treatment systems, and habitat restoration initiatives, among others, stakeholders can not only safeguard the ecological integrity of ghats but also promote cultural heritage preservation and community resilience. Engaging local communities in the rejuvenation process ensures their active participation and ownership, leading to more sustainable outcomes in the long run.

Furthermore, through collaborative efforts between policymakers, researchers, communities, and practitioners, it is possible to create a harmonious balance between human activities and natural ecosystems, thereby nurturing a sense of cultural identity and belonging rooted in the landscapes of our rivers.

### **Conclusion**

In conclusion, many of our Urban cities have rivers and Built River ghats, but the river ghats are presently rendered redundant. Revival and rejuvenation of ghats in urban areas through sustainable approaches and biophilia offers a promising avenue for bridging the gap between communities and nature, while fostering a deeper cultural connect. This study highlights the diverse array of spatial options, materials and methods available for revitalising these vital riverbank ecosystems in a manner that is environmentally sound, socially inclusive, and culturally enriching.

In essence, rejuvenating the River ghats in Urban areas and cities through a sustainable approach not only revitalises these important cultural landmarks but also reaffirms our interconnectedness with nature, paving the way for a more resilient and culturally vibrant future for generations to come.

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**Rejuvenating River Ghats for Sustainable Development - Establishing the Land-Water Connect”**

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