EPHEMERAL CONURBATION OF URBAN FORMS

Re-imagining an Impermanent City; Kumbh Mela 2025

A **Thesis**

Submitted in Partial Fulfilment of the

Requirements for Award of the Degree of

Bachelors in Architecture

by

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May 2023

Dedicated to my birth city, the Triveni Sangam City, Prayagraj
Sri Bade Hanuman Ji & my ever-supporting Parents

ACKNOWLEDGEMENT & GRATITUDE

I would like to offer my gratitude and appreciation to everyone who helped to make this research-based thesis a success in every possible manner. First and foremost, I express my gratitude to Sri Baje Hanuman Ji for all of the blessings granted.

I would like to express my sincere gratitude to the National Institute of Urban Affairs (NIUA) & National Mission for Clean Ganga (NMCG) also known as Namami Gange for recognizing my work and shortlisting me as one of the finalists under the Under Graduate Category for the Season-3 of "Student Thesis Competition" (STC). Their constant support & mentorship during different stages of this thesis development have been of great help to me.

The above Pictures are from the National level event on Urban Rivers, Dhara 2023 (Driving Holistic Action for Urban Rivers.), in Hyatt Pune, where all the finalists of STC, S-3, were invited to learn and share their views on how to conserve our river. Here I got a chance to present my view on how Youth can bring a change to Urban Rivers. I got to meet ***Shri G Asok Kumar,*** *current Director General of NMCG, and* ***Shri Rajiv Ranjan Mishra,*** *former Director General of NMCG*

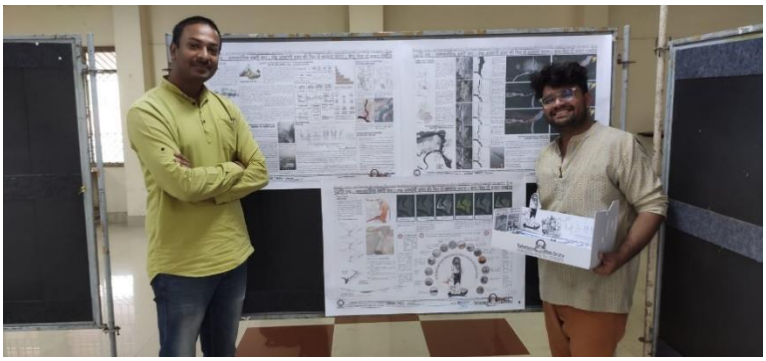
A special thanks and token of Gratitude to NMCG for providing me this opportunity to meet such eminent personalities and share my thesis idea with them and take their input. This event was clearly an eye-opener for me and where I got to meet experts from the industry working to conserve our urban rivers and provide us with a healthy living environment.


The above Pictures are from the Writeshop conducted specially for the Finalists of STC, S-3, where we learned how to frame our thesis and how to conduct the desired research, it gave me an idea of how to approach my thesis and do what is best for the issues in the current system.

*The above pictures are again from Dhara 2023, where I was among one of the panelists for an event entitled "Youth for Rivers". Special mention and thanks to the co-panelists, my peers, and the chairs **Mr. Himanshu Badoni**, Executive Director(Projects), NMCG, and **Mr. Dheeraj Joshi**, Deputy Secretary, NMCG*

Thank you NIUA & NMCG for conducting this session & providing me with this amazing platform to learn and exchange thoughts on Urban Rivers.

A special thanks to my thesis mentor & guide, **Ar. Ritesh Ranjan,** Assistant Professor, DAP-NITC, for spending a significant amount of time assisting me with many elements of my thesis studies. I would also thank Architect & Urban Planner**, Mr. Ashwini Dubey**, currently working as Urban Planner with NMCG who has been my mentor for STC, S-3. This thesis would not have concluded if it hadn't been for their patience and unwavering support.




My thesis mentor & guide Ar. Ritesh Ranjan, a picture from the Thesis 1 evaluation, conducted at DAP-NITC & a picture of my mentor Mr. Ashwini Dubey, Urban Planner at NMCG.

I would also like to thank **Shri Vivek Chaturvedi**, ADM & Additional Mela Adhikari,

Prayagraj Mela Authority, looking after Magh Kumbh Mela 2023, for sharing site details and guiding me through how the fest is organized, along with him **Dr. Anand Singh**, Sanitation & Cleanliness officer of Magh Kumbh Mela 2023, who was also partially looking after the healthcare system of Magh Mela, gave me insight on the current existing issue and measure they have taken for the betterment of Magh Kumbh mela, they both had really appreciated my presence and helped me throughout the site visits.

I would not forget to mention **Dr. Purnendu Mishra**, Professor, Faulty of Law, Allahabad University, who helped connect with the concerned authorities and guided me throughout the site visits, fortunately, his father has worked as Mela Adhikari at Prayagraj Mela Authority, who has retired now while helping him, he has got a great idea about the spaces and management of the Kumbh Mela. He even connected me with various locals there, which helped me understand the user aspects as well very closely.

The above pictures are from the site visit of the Magh Kumbh Mela 2023, the first one is with Shri Vivek Chaturvedi, ADM & Additional Mela Adhikari, Prayagraj Mela Authority & Dr. Purnendu Mishra, Professor, Faculty of Law, Allahabad University and the second one is with Dr. Anand Singh, Sanitation & Cleanliness officer of Magh Kumbh Mela 2023

I would also want to express my gratitude to **Dr. Anjana Bhagyanathan**, Thesis Coordinator and Faculty Advisor, for structuring and organizing this course. It's my privilege to extend my gratitude to all my faculties, staff & my fellows of the Department of Architecture, National Institute of Technology Calicut. I am grateful to everyone who has helped in different stages of my work to complete this study.

Last but not least, I want to express my gratitude to my friends and family for their unwavering support.

DECLARATION

I hereby declare that except where specific reference is made to the work of others, the contents of this thesis are original and have not been submitted in whole or in part for consideration for any other degree or qualification in this, or any other university. This thesis is my own work and does not contain any outcome of work done in collaboration with others, except as specified in the text and Acknowledgements.

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CERTIFICATION

This is to certify that the report entitled "**Ephemeral Conurbation of Urban Forms: Re-imagining an Impermanent City; Kumbh Mela 2025**" submitted by **Mr. Vishrut Goswami** to the National Institute of Technology Calicut in partial fulfillment of the requirements for the award of the degree of B.Arch. is a true and accurate record of the work he completed under my supervision and guidance. The thesis's material has not been submitted to any other Institute or University for the granting of any other degree or certificate, in whole or in part.

Place:
Date:

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(Guide & Mentor)

Dr. Anjana Bhagyanathan
(Course Co-ordinator)

Signature of Head of Department, DAP

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National Institute of Technology Calicut

THESIS EVALUATION

This is to certify that **VISHRUT GOSWAMI** (Roll No: B180263AR) has successfully defended the Thesis entitled "**Ephemeral Conurbation of Urban Forms: Re-imagining an Impermanent City; Kumbh Mela 2025**" on ___ / ___ / _____.

The committee recommends the candidate for the award of the degree of

Bachelors in Architecture.

Signature of External Examiner Signature of Internal Examiner

ABSTRACT

In a burgeoning cosmos where automation and socio-economic shifts are unfolding at considerable furtherance, it is inadmissible for anything to endure stagnancy. In the essence of the spatiotemporal continuum, human existence is itself just at a mere split of the fingers.

Realizing that there is no dichotomy in the concept of architectural permanence is the first stepin any conversation. Design is simply a moment inside an ongoing condition of material flow,nothing is permanent or impermanent; rather, everything exists at differing stages of impermanence. As individuals, we frequently associate the need to leave our mark—to leave behind a cultural symbol of creativity—with the need to create. It is worth considering why we build at all in light of the rising overconsumption of finite resources because every act of construction is equally an act of destruction.

This thesis is an investigation of various possibilities in temporary architecture and urban spaces. It aims to question and challenge the accepted assumptions of architecture in terms oftime and permanence, in the context of urban landscapes. It inspects how much potential ephemeral architecture has to become a state-of-the-art model in developing cities but also will formulate and understand current models to scrutinize their capability to give contemporary remedies to changing urban dynamics and urban processes alongside conventional architectural approaches.

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CHAPTER 1: INTRODUCTION

1.1 PREAMBLE

In an ever-growing world where technology and socioeconomic trends are unfolding at a considerably increasing rate, it is inadmissible for anything to remain stagnant. In the grand scheme of time and space, human civilization as a whole is a mere split of the fingers.

With roots in Sangam City, Prayagraj, I have always admired my city, it has a vibrant history and a glorious past. Having had a chance to be woven into the thread of storytellers, from the Kumbh Mela, one of the world's largest peaceful, religious gatherings, with an estimated 120 million people visiting over the two months, is as astonishing as is to see its ever-growing pack.

In light of the rapidly changing environmental and social atmosphere, its architecture cannot keep up with changes in technological, social, and ecological needs. The sheer size of the gathering raises many logistical challenges for the governments that regulate and plan the Kumbh Mela. Historically, the Kumbh Mela has had issues with the control and safety of the masses of pilgrims. Part of the solution for controlling the masses of people is the careful planning of infrastructure and built complexes. The Kumbh Mela has continued to grow drastically over time and has grown into the complex mega-city that gets constructed for each pilgrimage.

This thesis is my trivial contribution to my city. It will investigate various possibilities in impermanent architecture and urban spaces. It aims to question and challenge the accepted assumptions of architecture in terms of time and permanence in the context of urban landscapes. It will not only inspect how much potential ephemeral architecture has to become a new model in developing cities but also will formulate and understand new models to scrutinize its capability to give new remedies to changing urban dynamics and urban processes alongside conventional architectural approaches.

Ephemeral architecture has thrived throughout the history of our time. Once we think about temporary architecture, we expect architecture that's deployable, easy, and built using cheap materials. From prehistoric times we've seen temporary architecture getting used for emergent situations, wartime, pop-ups, and exhibition spaces. But today we see projects that are developed with temporary architecture that show innovative ideas for the long run of architecture and urbanism.

What do the Pyramid of Giza, the Eiffel Tower, and post–World War II housing have in common? They're all built with a kind of construction called prefabrication. Prefabrication isn't a replacement concept. It allows various building elements to be built off-site in an exceeding factory or workshop and fitted together on-site, revolutionizing the industry by lowering on time, cost, and labor needed to make a structure.

Inspired by building techniques dating as far back because the Mesopotamian civilization its use is documented as far back as 1624 with a panelized wood house shipped from England to Massachusetts. Over the subsequent four centuries, as highlighted within the video from Redshift by Autodesk, "The History of Prefabrication, From Roman Forts to Modern Modular Housing," a surprising number of opportunities for prefabrication are seized upon within the history of the trendy world. Let's understand this better with their views.

This thesis is an investigation of various possibilities of impermanent architecture in urban spaces. It aims to question and challenge the accepted assumptions of architecture in terms of time and permanence in the context of urban landscapes. I would also look into how temporary architecture would develop new relationships with the urban built & unbuilt environment.

1.2 NEED OF THE STUDY

Modern urban landscapes are critically dependent on how quickly cities are growing today. Designing for permanency is an involuntary reflex on the dynamic social, economic, and political spheres. The constructed environment should instead be oriented on the individual's ever-changing demands. Given the importance of this focus, the architecture is adaptable and may evolve and adapt quickly as needed.

Apart from the urban requirements, there is an inherent link between shelter and well-being, architecture is a crucial aspect of human existence. Huge numbers of people continue to be uprooted by conflict, resource insecurity, natural disaster, climatic change, and racial conflicts, forcing them to seek shelter in the constantly expanding informal settlements.

The various styles that historically immediately responded to culture, region, and climate have been eroded as architecture converges into a single homogeneous language. To examine the idea of architectural permanence, one must look beyond the structure's physical and material characteristics and concentrate on the cultural and ecological effects of architectural intervention.

A brand-new form of urbanism called the ephemeral City pulls together instances of urban dissonance that are apparent in many contemporary cities. Through the use of transitory space, it enables a Raging of uncertainty that promotes social agency and urban involvement. It creates livable areas where the post-Fordist network society can function. This rise in demand created a need for research and innovation. My seminar looks into these aspects of how temporary architecture would develop new relationships with the urban built & unbuilt environment and the role of prefabrication in that context, not limited to the walls of concrete, it would explore new possible materials, techniques, and adaptive re-use possibilities in the mass reproductive scale while keeping it sustainable and nature-friendly.

1.3 AIM

To Investigate the potential of impermanence and reimagine an ephemeral megacity on the bank of Triveni Sangam that crumbles when its purpose is fulfilled and orients new aspects.

1.4 OBJECTIVES

- **OB 1:** To broadly study temporary architecture & prefab, and reimagine the building construction systems for mass camping.
- **OB 2:** To masterplan a few sectors, with all facilities from housing to basic necessities, for the Kumbh Mela 2025
- **OB 3:** Develop a modular replicative system to be used in a cumulative manner to create the master plan for Kumbh Mela.
- **OB 4:** The final product to be observed is a solution for mass gatherings that is disaster-proof & weather resilient, and easy to transport.

1.5 SCOPE OF THE STUDY

This thesis project will explore and implement a system of structure and construction that can be assembled and disassembled with extremely efficient labor and production of materials. The design and specifications will engage lightweight, sustainable materials, and a system of spaces or buildings that can be erected, deconstructed, and transported efficiently. Locally sourced materials contribute to both the constructability and authenticity of the architecture. Especially in projects that can be applied to multiple sites, it is imperative that the context and vernacular are considered and respected

1.6 RELEVANCE OF THE TOPIC

Over time, we can see that many unalike instants of temporary architecture or alternate building, methods have been explored for different purposes. The first motive of the research for this seminar will be the historical precedents of the alternate possibilities. It would mainly explore when temporary architecture was used and why it was used there. Can temporary architecture be used in innovative and imaginative ways to empower urban areas which are abandoned and isolated?
Through a thorough investigation of contemporary and historical urban and architectural theories, the concept of the Impermanent City was established. I was aware that I wanted to interact with people on a bigger scale, and the concept of "Ephemeral Urban Form" fits the bill.

The root cause behind adhering to this specific topic arose from some of the self-observations throughout two partially rememberable decades of my life on the coast of Holy Sangam, where Kumbh Mela, a riverbank festival that honors the holiness of the confluence of the sacred rivers Yamuna, Ganga & Saraswathi takes place. The lack of controlling the masses, and the troublesome planning of infrastructure and building complexes. With partial leftover remains from tents to their floating pieces during the rainy season. Inappropriate usage of resources and lack of distribution facilities.

The original concept was a new style of urbanism to put people back at the forefront of urban planning and give them agency in their surroundings. But after understanding the topic, I can say that the Impermanent City is a community that does not hold its artifacts in high regard but rather enables society to determine how the built environment is distributed. As a result, this seminar will not only be limited to the tangible aspects but also worked on the negligence towards weather resilient design in harsh winters also leaves the pilgrimages to tremble in the cold winters. I have been a witness to the same,and thus as an aspiring architect and a planner, this seminar report would be my mere contribution to this reoccurring issue in the mega-city planned on the banks of Sangam.

1.7 LIMITATIONS

The expected limitations might result from time constraints, ephemeral architecture design derivatives have an immense number of unexplored domains, here only a few are being touched to light on new possible materials, and defining regulatory policies.

1.8 ENVISIONED OUTCOME

In an ever-growing world where technology and socio-economic trends are unfolding at a considerably increasing rate, it is inadmissible for anything to remain stagnant. In the grand scheme of time and space, human civilization as a whole is at a mere split of the fingers.

The **desired outcome** will be a system of structure and building that can be put together and taken apart with incredibly efficient labor and material output. A solution for large gatherings will be the last reflection to be noticed. Apart from this, policies play a major role in a city's development. This being a temporary mega-city, interventions in the currently existing system of rules need an updation and hence will be incorporated here. The anticipated outcome would be to strengthen the city's economy by assisting various social strata and to celebrate this Kumbh Nagri not only for festive occasions but also for its rich tradition and affection.

The urban ephemeral form thus developed could be used for various purposes like festivals, melas (gathering), in case of natural calamities/disasters, quick camping solutions, can be used for temporary settlements for refugees, temporary hospitals in case of any calamities, etc.

CHAPTER 2: METHODOLOGY

2.1 GENERAL RESEARCH

(Exploration of architecture concerning time) Temporary or ephemeral Architecture

Method: Collection of theoretical and analytical research to understand the relevance & issues related to temporary architecture

Technique: Literature reviews and drawing conclusions and analysis

Outcomes: Logical & adaptable interpretations to approach the design of similar structures. Understand complications and solutions that have been used and tabulate the development guidelines

2.2 CONTEXTUAL RESEARCH

Method: To develop knowledge and interpretations by studying and understanding human actions and their circumstances related to decisions regarding the use of temporary architecture and thus the evolution of pre-fabrication.

Technique: Studying works of literature, styles, or trends in architecture. and its history and drawing correlations between historic facts, descriptive analysis, and interpretation

Outcomes: Aim to understand an exposition of the materials used and trends of temporality through the history of time and relate it to current prefabrication techniques.

2.3 PRECEDENT STUDY

Method: To conduct comparative research of different case studies to understand different techniques & measures used in the pre-fabrication industry and other established criteria

Technique: Inspection of various studies. Thorough analysis and interpretations through diagrams and photogrammetric essays.

Outcomes: Understand approaches or infusions for the typologies in terms of structure and materials. Comparison of the different models studied to understand the better solution for given criteria.

2.4 DATA COLLECTION & DISCUSSION

Method: To collect preliminary data & design standards as per requirements and set up criteria for prototyping, then use surveying to understand the user requirements.

Technique: Deriving design guidelines, making physical models for mockups, and incorporating user-based interventions in the design.

Outcomes: Come up with new approaches or infusions for the typologies in terms of structure and materials. Comparison of the different models studied to understand the better solution for given criteria.

2.5 DESIGN DEVELOPMENT

Design through research:

To develop design guidelines & finalize for prototyping using the research conducted in different narratives and city contexts for the development of prefabricated temporal architecture in an urban scenario.

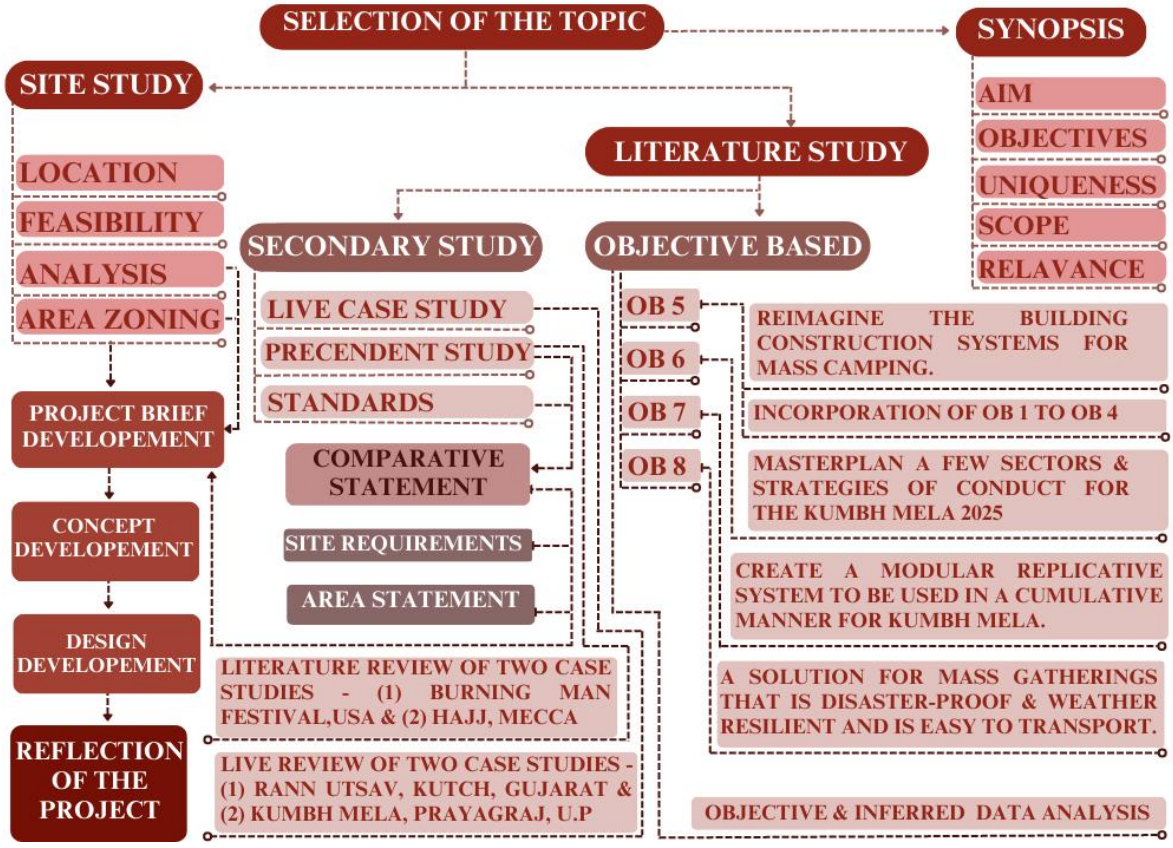


Fig 2.1 Flow Chart showcasing the Strategic Methodology

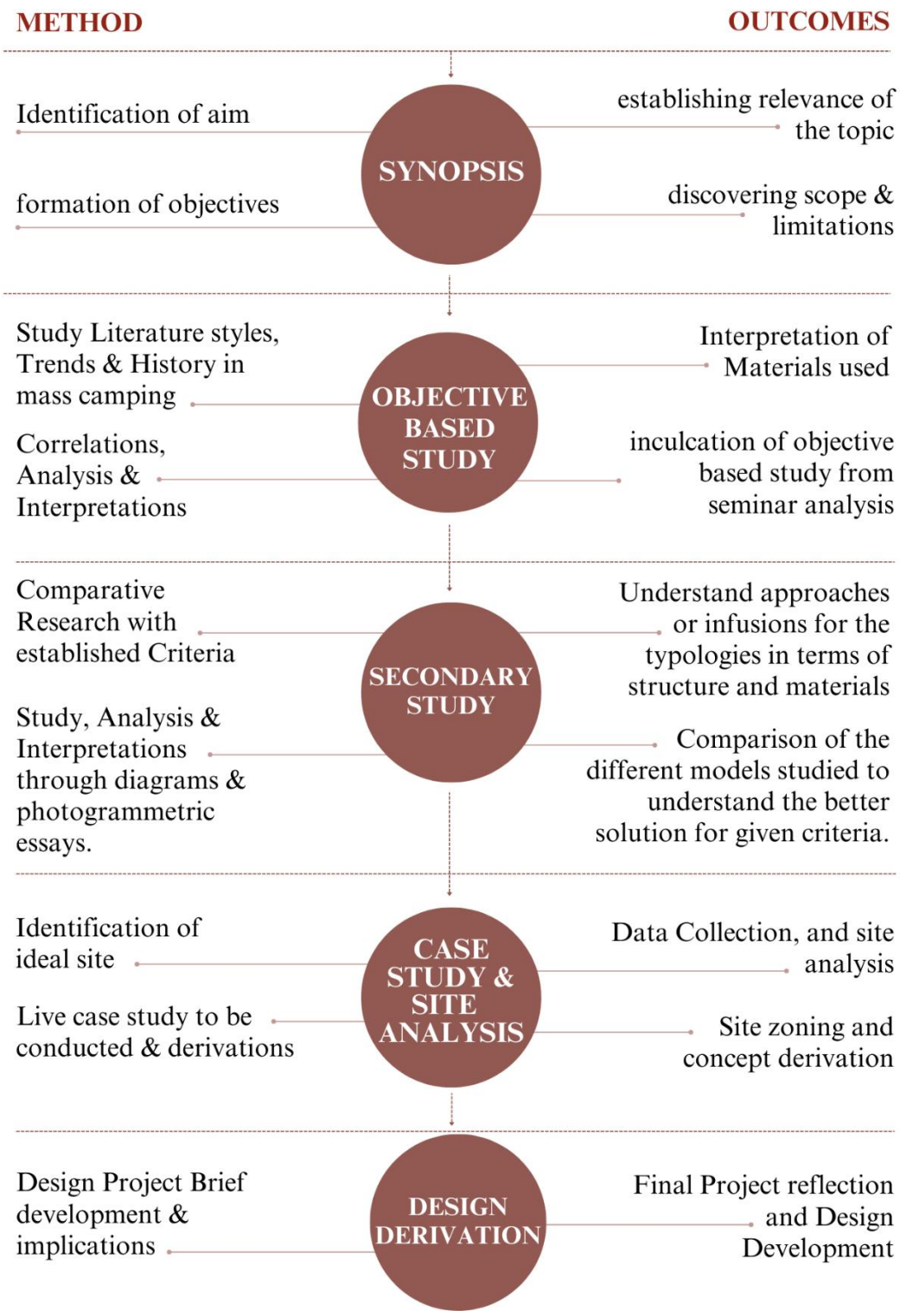


Fig 2.2 Flow Chart showcasing the Working Methodology for the Seminar

CHAPTER 3: EPHEMERAL ARCHITECTURE

3.1 WHAT IS EPHEMERAL ARCHITECTURE

Ephemeral architectures are systems that facilitate the momentary modification of any location whose fundamental existence depends on its fleeting nature. Their transience, which liberates them from a variety of functional, structural, and financial restrictions, makes them particularly alluring since it allows their creators to express ideas that would be impossible to convey through other permanent architectural structures. (Rodríguez-León& Sanchez, 2013)

Ephemeral architecture or Intermittent architecture as a paradigm is a term that should only be applied to certain situations and objectives. To demonstrate the case for an ephemeral intervention on the site, projects must be simple to build and demolish in order to act as transitory constructions. But the question here is

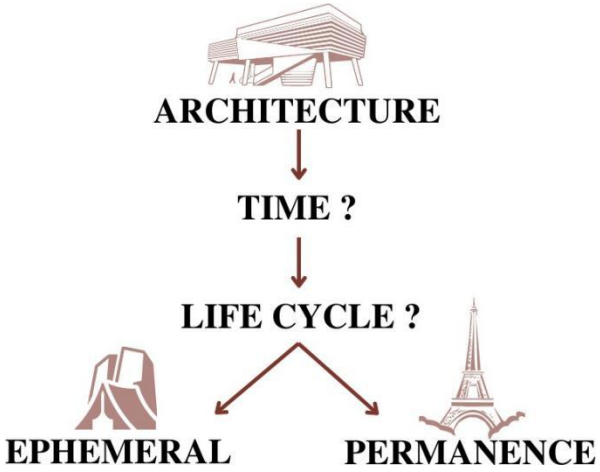


Fig 3.1: Infographic of the interrelation of Architecture, Time & Permanence, Source: Author

Can architecture be delineated about pulse stressing more towards the life cycle of it, program use, and materials? In such a scenario will we incline more towards ephemeral orpermanency?

THE QUESTION THAT SURFACES HERE IS, CAN EPHEMERAL URBAN FORMS SOLVE THE ISSUE OF SAFETY &SECURITY?

3.2 WHY SAFETY & SECURITY?

Let's understand this with the origin of human settlement.

The early farmers established their roots, both physically and metaphorically, at some point about ten thousand years ago, marking the beginning of human habitation. In many regions around the world, agriculture paved the path for reliable food supply and allowed hunter-gatherers to construct permanent settlements that later evolved into composite communities.

As per the NCERT book, "Human Settlement means a cluster of dwellings of any type or size where human beings live. For this purpose, people may erect houses and other structures and command some area or territory as their economic support base."

Thus, the main reason for earthlings to start to conduct themselves in settlements was to protect the masses from adverse weather conditions, predators & enemies and to safeguard their food supplies and domestic animals. The feeling of Safety & Security acted as a catalyst for the plethora of high-rises we see today.

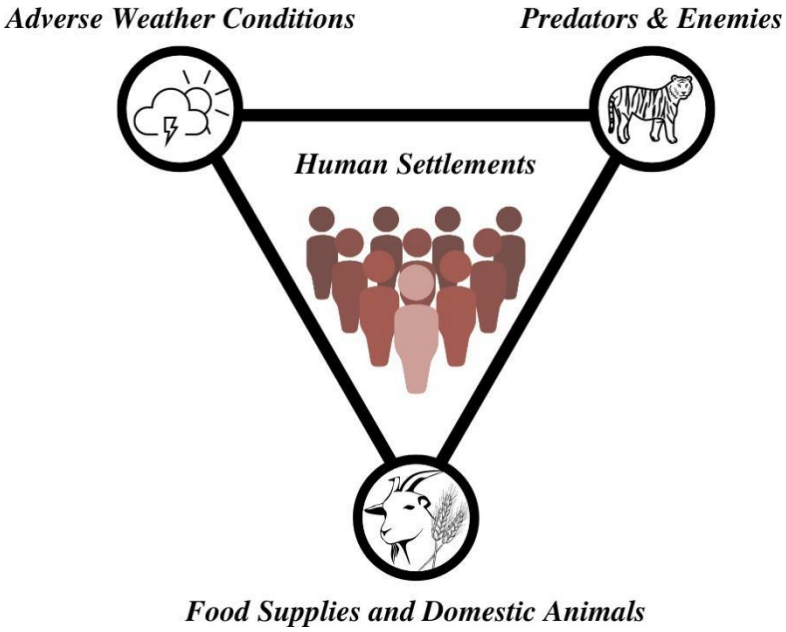


Fig 3.2 Infographic showcasing drivers of Human Settlements. Source: Author

3.3 EPHEMERAL ARCHITECTURE THROUGHOUT HISTORY

Throughout man's first homes, the impermanent architectural style has been a concept in use. It may be applied to support a different way of life, unencumbered by the need to stay put for an extended length of time.

Ephemeral architecture is linked to the emergence and disappearance of architectural structures connected to a particular memorial. One of the most striking instances of transitory architecture initially arise in the Renaissance, grow in prominence throughout the Baroque era, and reach its zenith as a part of Universal Expositions in the second half of the nineteenth century and the early twentieth centuries. Ephemeral structures are now employed as monitoring stations for architectural innovation. Every celebration in the Baroque era had a backdrop because the fleeting nature of the event was appreciated. (Rodríguez-León & Sanchez, 2013)

"How can we learn to live dissimilarity? So differently that we might soon- very soon- become non-modern? "

-John May 2019, Signal. Image. Architecture: (everything is Already an Image)

This quote could be kept in a variety of ways. But I worry that we shall soon live in a world that no longer exists. The architecture was designed to reflect the change and be temporary, but today we can see and comprehend that impermanence has replaced permanence. Everything we know is changing so quickly. Isn't it urgent to create an architecture that can quickly adapt to these changes as they occur? The standard architecture that exists today was created with the idea that change would be rather slowto come about. The following examines more of what ephemeral urbanism's possible driving conditions might be. Ephemeral or temporary architecture might be a good way to handle unsettling ambiguity. (Anastasia Karandinou, School of Architecture, University of Portsmouth, 2013)

Architecture has always been preoccupied with monumentality and permanence, attempting to infuse and retain significance into the physical structures and the rituals surrounding them. Even if they take varied forms, these attitudes are widespread across the world. Buildings that have endured (or not) through the ages indicate various cultural attitudes regarding durability that go beyond simple architectural considerations and reveal a concept of the universe and of life. (Armada, 2012)

Through gigantic structures that aim for perfection, ancient Western architecture illustrates humankind's quest for immortality and godliness. Architectural historian Clay

Lancaster compares Western and Eastern architectural styles in his essay "Metaphysical Beliefs and Architectural Principles." (Armada, 2012) He argues that the first principle that springs to mind is that of Western cohesion as contrasted to Eastern fragility. As opposed to the Eastern style of building, which uses thin timbers, the Western structure has thick brick walls. They developed what they thought to be God-worthy buildings due to the materiality of Western architecture and idealistic proportional system.

Insubstantial architecture only lasts for a moment because of how fast and quickly our environment is changing. An infrastructure that may easily come into being and go will provide a feeling of continuity in a world that demands instant pleasure. The project will have a good influence on ecology in response to the huge waste produced by our existing paradigm of planned antiquation, but its primary goal will be to have a lasting cultural impression via the manifestation of ephemerality. The structure will offer a didactic experience, exhibiting the beauty and sustainability of transient things.

Shown below, is a Bibliometric analysis of Ephemeral Architecture in two decades, in the Co-occurrence format. The keyword searched was, "ephemeral-architecture" on 28-10-22, 19:05

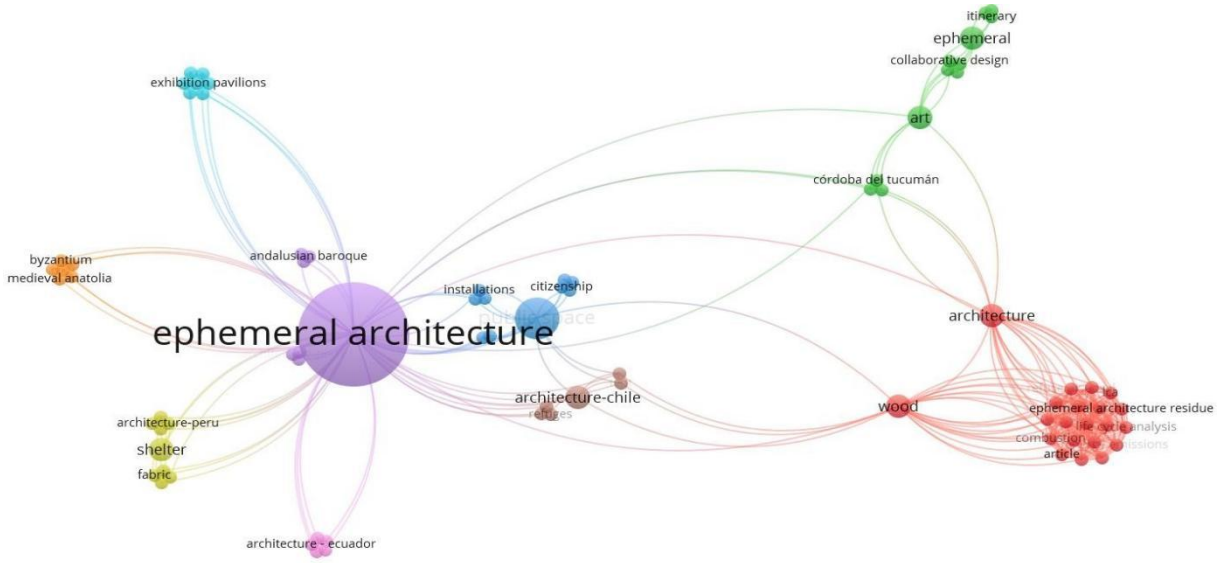


Fig 3.3 Co-occurrence (2002-2012), Author, Source: VOS viewer

The above figure (3.3) shows us the co-occurrence of some related words in the last decade (2002-2012) in the field of Ephemeral Architecture. Some very common repetitions were seen between ephemeral architecture and its fabric, installation, citizenship, and residue.

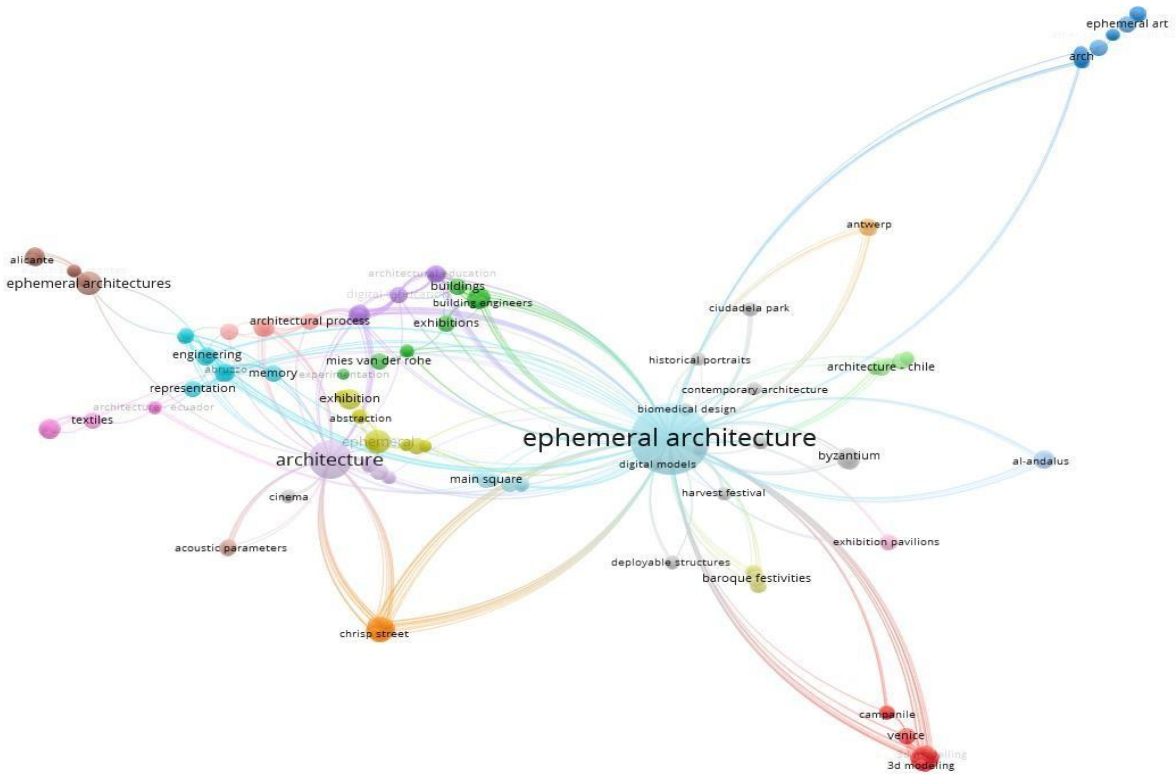


Fig 3.4 Co-occurrence (2012-2022), Author, Source: VOS viewer

The above figure (3.4) shows us the co-occurrence of some related words in the last decade in the field of Ephemeral Architecture. Some of the very common repetitions were seen between ephemeral architecture and public spaces, pavilions, streets, and buildings.

3.4 DECONSTRUCTION & FRAGMENTATION

Architecture's representation of time can be quantified empirically through continental crust, certainly in terms of how easily it can be broken down and dispersed through time. The building must persist for a brief period before dissipating to generate a transient experience. After the comprehensive whole has been disassembled, the meaning will still be preserved by the remaining building pieces. (Armada, 2012)

Thus, the basaltic goals of transitory architecture are to enhance deconstruction effectiveness and simplicity while devising a system that allows for the reclamation and preservation of entire building parts. (Armada, 2012)

Ephemeral architecture potentially benefits from an approach employed in ecologically sustainable procedures called designing for expected deconstruction. Architects working in the Design for Deconstruction movement simplify building construction in recognition of the fact that structures do not survive indefinitely. This simplifies the process of

and reusing components after a structure is no longer useful. The adaptability and flexibility that this approach promotes, as well as the minimum of construction elements and materials and the simplification and standardization of connection details, can all be leveraged to design architecture that emerges and disappears as effortlessly as time itself.(Armada, 2012; Coetzer, 2013)

Deconstruction is a way to express deterioration, which is a natural aging and fading process, in the ephemeral building. This process itself can be lovely because it alludes to the fact that the natural world is impermanent. In music and art, recurring themes include impermanence and decay. (Armada, 2012)

“In his book It is Beautiful, Graphic Designer Martin Venezky discusses how his perspective on ephemerality and degradation influences his creative output and vanishes. He claims,“

“I don’t encourage my work toward permanence. The materials I use are tape, cardboard copy paper, pencil, and wax-practically beg to disintegrate. If pieces flutter off, what remains means more to me. It can come apart. It ages. It is more alive than a digital file, whose permanence and fidelity have no precedence in our organic decaying wonderful world.”

- *“Martin Venezky, It is Beautiful... Then Gone, (New York: Princeton Architectural Press, 2005)”*

-

Rather than become massive or lengthy, architecture may contribute to this creative conversation and cultural relevance through demolition. Since fragmentation usually remains due to deterioration and maintains a memory or moment in time through parts of one, it is a perfect companion to disassembly.(Armada, 2012)

Because of their alleged cultural significance, pieces of anything from structures to human beings have been kept throughout history. The 4th devotion of remnants in Catholicism is an example of how people have the propensity to give historical artifacts significance. People would perform ritualistic worship of the preserved human remains they believed to be saints, which helped to unite religious culture and its adherents. (Armada, 2012)

Because building components are some of the most enduring works of art, the idea of fragmentation is particularly well-established in the history of architecture. Spolia, or pieces removed from historic monuments, were employed as free-standing historical artifacts as well as incorporated into modern construction. These components included figural reliefs, column elements, and pieces of the entablature. Spoliation was utilized to convey a variety of messages, including triumph and grandeur as well as devotion and tradition, all of whichwere connected ancient times including the importance of the history. The fragment's unique purpose and significance may have been lost, but it was replaced by a cultural meaning that was more appropriate. (Armada, 2012; Elsner, 2000)

The Arch of Constantine in Rome is attributed to a collage of Spolia, fragments adopted from similar buildings. When the arch was being constructed, these fragments evoked nostalgic thoughts and touched on Romans' feelings. The pieces were combined to create anew form, which made them hallowed objects comparable to Christian relics. The arch represented Roman victory and history. (Rodríguez-León & Sanchez, 2013)

Fig 3.5: The features of separate pieces and the Roman Arch of Constantine: Source: Author

CHAPTER 4: TEMPORARY URBANISM

Urban environment analysis is a very difficult undertaking since it requires dissecting a wide range of temporal and spatial dynamics influencing people and places. Two key elements should be taken into account when examining how cities have evolved. First, cities are the outcome of an ongoing development and method of rehabilitation based on reuse and redundancy (Andres & Kraftl, 2021; Bryson, 1997). The second is that the building design is never steady and finished entirely; in fact, the "unfinished" is a feature of centralcity existence. (Andres & Kraftl, 2021; Lerup, 1977).

For starters, words like ephemerality, transience, brightness, pop-up, tactical, and DIY have been used to describe short-lived undertakings. The transitory length of usage, strategy, or project put up in certain areas is the thematic emphasis. The idea of time is thoroughly integrated with both the term in this situation. Every day, contemporary urbanisms link to chronology. (Andres & Kraftl, 2021; Madanipour, 2018).

Shown below, is a Bibliometric analysis of Ephemeral Architecture in two decades, in the Co-Authored & Co-occurrence format. The keyword searched was, "ephemeral-architecture" on 30-10-22, 20:27

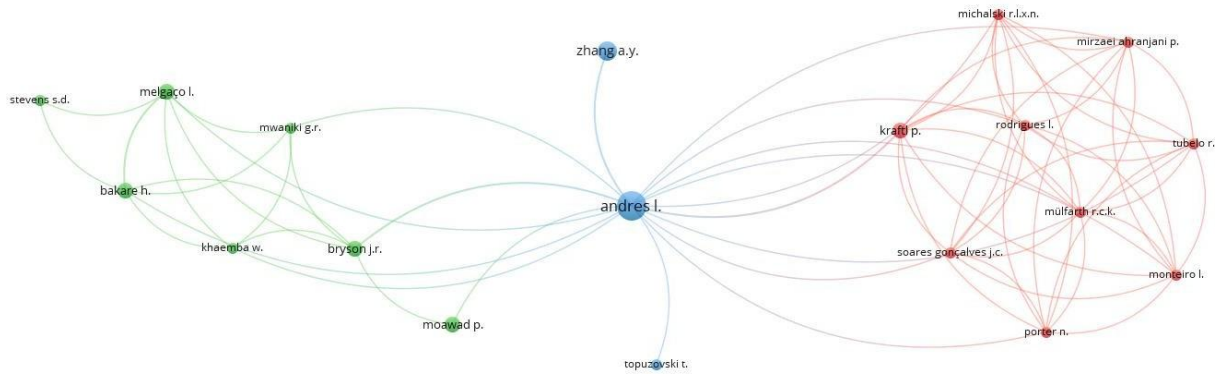


Fig 4.1: Co-Author (2012-2022), Author, Source: VOS viewer

The above figure (4.1) shows us the co-authored documents in the last decade in the field of Temporary Urbanism. It is very evident that only a set of researchers have been looking into this domain and it has immense potential for further outlook and major research.

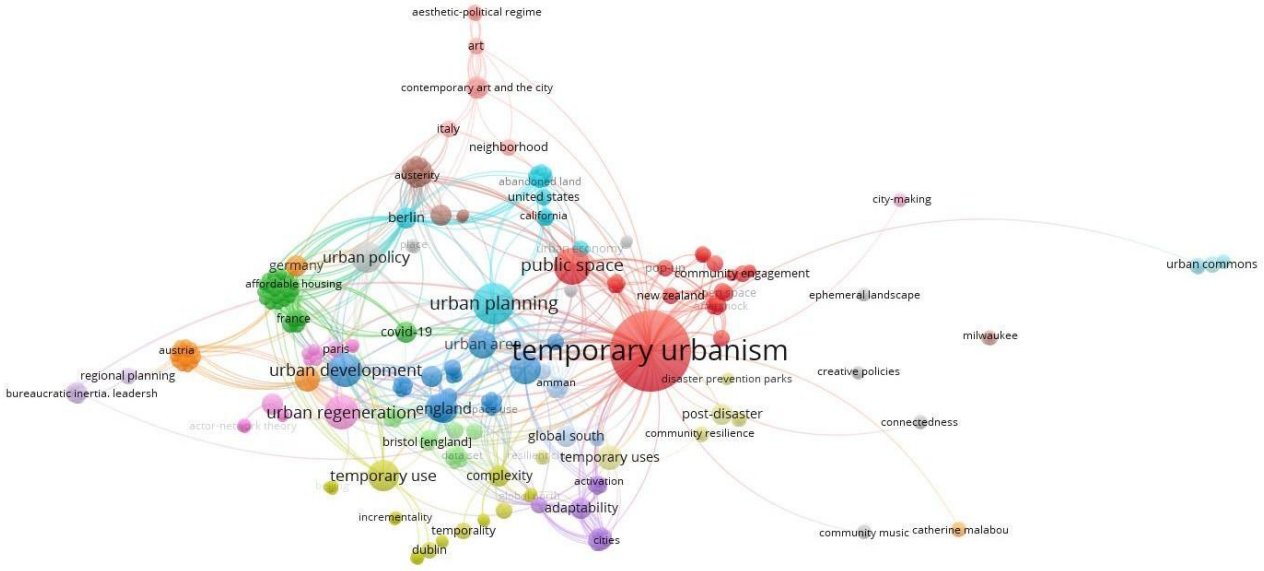


Fig 4.2: Co-Occurrence (2012-2022), Author, Source: VOS viewer

The above figure (4.2) shows us the co-occurrence of Keywords in the last decade in the field ofTemporary Urbanism. Some of the very common repetitions were seen between temporary urbanism and urban planning, temporary use, public spaces, urban policies, planning & development, urban regeneration, adaptive reuse, etc.

These results leave us to think and the question which arises here is:

WHAT ARE THE DRIVING FACTORS PUSHING US TOWARDS TEMPORARY ARCHITECTURE? WHY TEMPORARY?

The following investigates what might be the driving force for Transitory urbanism. Temporary architecture might be a good way to handle unsettling ambiguity.

4.1 PROVIDING A WAY FOR INNOVATION, EXPLORATION, ANDEXPERIMENTATION

For a limited time, more adaptable approaches and solutions can be attempted and tested. Temporary structures can also be thought of as a means to experiment with new materialsin a more intimate setting.

FIG 4.3: Hi-fi by The Living, where the bricks are made of agricultural waste (Courtesy ofthe living architects)

4.2 SUITABLE FOR IMMEDIATE IMPROVEMENT ANDDYNAMICALLY RESPONSIVE

Spaces can be designed more adaptable to accommodate sudden changes in program and location. By making minor adjustments to the structure, such as the addition or removal ofparts, the same space can be employed in a variety of ways to meet various plans and needs.

FIG 4.4: Art Nova inflatable mobile concert hall by Arata Isozaki and Anish Kapoor This building can be moved about and is truck-transportable. (Courtesydezeen)

FIG 4.5: One of India's most famous Circus Rambo Circus, explores this possibility (Courtesy allaboutbelgaum.com)

4.3 VACANT SPACES: THE SPACE BETWEEN THE OLD AND THE NEW

Vacant areas with transient activities can be used for temporary interventions in a variety of contexts and situations. Many vacant buildings could be employed wisely for short-term activities. As a result of technological advancements, conventional production methods are no longer used in many industries.

Today, we also notice that many shopping malls in densely populated areas are simply abandoned. Even in offices where the facility is unoccupied during business hours, temporary architecture can be deployed in areas during unproductive downtime. Temporary architecture can bring life to bare spaces that are intended for temporary usage. To reclaim and reinvigorate unused and abandoned locations, a variety of pop-up spaces might be created.

4.4 CREATIVE MARKETING PATTERNS FOR ECOMMERCE,AUCTIONING

Retail establishments are attempting to innovate the way we shop today. The majority of shoppers now do their shopping online. Pop-ups have begun to take on a significant role as a result of mall vacancies and sky-high building lease prices. The pictures below show some pop-up stores from this year. According to a study by USC's College of Retail and Storefront, 80% of the brands are satisfied with their pop-up experiences.

FIG 4.6: Snarkitecture's traveling installation. Snarkitecture's The Beach employs common, affordable materials to produce remarkable, surreal experiences. (Courtesy inhabitat.com)

4.5 AN EMPLOYMENT STYLE

We have learned how flexible work life may be thanks to the pandemic. The way people began using the workplace has been evolving continually. Adaptable workspaces can be utilized for a variety of purposes outside of work. among them are shifting locations, and working during an opportune time.

The examples below demonstrate how innovative pop-up venues that promote novel experiences and direct human interaction with the installation are on the rise in the 2019 – 2020 period. The image shown here is an infographic featuring research information fromStorefront and the USD College of Retail.

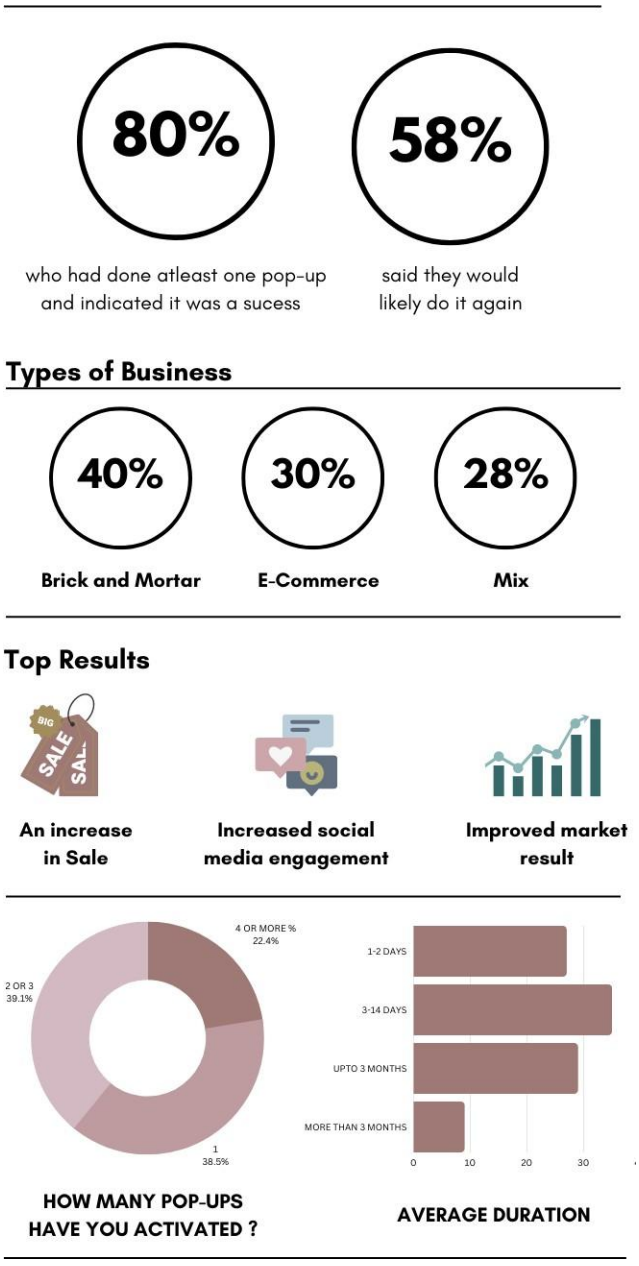


FIG 4.7: infographic illustrating how pop-up retail stores are evolving into a new form of brand strategy, according to research done by the University of South Carolina Department of Retailing andStorefront. (Author's interpretation with the help of (Sravya Sirigiri, 2021)*)*

4.6 NEW SPACES TYPOLOGIES

Working remotely has drawbacks as well, and solitude is one of them. New forms of settings, including instagrammable cafeterias, have been created as a result of other influences like social media. new locations for collaboration. We encourage collaboration with diverse kinds of start-ups in incubator environments. The space's multiple uses are beginning to receive more attention. We may now operate remotely thanks to the advancement of Wi-Fi technologies, which has led to the creation of new space typologiesthat support these trends.

4.7 CHANGES IN PEOPLE'S WAYS OF LIVING AND USING THESPACE

Thinking about the temporary architecture of the future is greatly influenced by technology and the way we live today. Nowadays, living and traveling are so transient in our way of life. On our cell phones, we can simply find whatever information we need. Google Maps, the camera, music, email, and the Internet provide us access to everything we need to stayconnected, no matter where we are. With the effect of social networking, fast communication, and information accessibility, we have an advantage when it comes to marketing temporary structures. It is simple to publicize it through flash events and festivals to speak to particular social groups. Events tailored to various contexts can be developed using temporary architecture.

CHAPTER 5:

TEMPORALITY OF TEMPORARY URBANISM

Through this study, I want to explore the historical significance of prior temporary architecture approaches. To comprehend the aesthetics and construction of the impermanent building, look at its earliest manifestation. I hope to gain knowledge of how to think about a new ecologically conscious design strategy for architecture by understanding temporary architecture and alterations that were considered significant at various moments in time.

We frequently discover that temporary constructions, in particular, have a bigger effect on the neighborhood and the individuals who use such facilities. When we examine several vernacular examples, we can observe that the materials used and the types of structures chosen were determined by the building's context, location, and climate. We can tell from the vernacular architecture examples that the structure closely relates to the area it was built in. Technologies have revolutionized every facet of construction, including manufacturing, building systems, and the materials we employ, which has had a big impact on modern architecture and temporary constructions.

The ephemeral architecture was the very first type of structure created by people. They needed refuge to survive, thus it was crucial. Because of their nomadic and migratory lifestyles and intimate knowledge of the location, these people were able to create some temporary ephemeral structures. The majority of the early forms of shelter consisted of large timbers that were covered with turf or earth. They employed clay-based Adobe structures in warmer climates.

5.1A CRYSTAL PALACE

In 1851, Crystal Palace was created. Sir Joseph Paxton built a fantastic display facility here. At that time, this structure made a powerful technological statement. It took six months to construct using brand-new techniques. In terms of using iron and glass to create vast spans, it was groundbreaking. The most important thing to keep in mind at this point is that it was normally put together and put together to be put together again at a different spot. The building's biggest size and use of prefabricated materials—both of which were novel at the time—make it stand out.

5.1B THE DYMAXION HOUSE

It was well-known that Buckminster Fuller was an unorthodox innovator with original ideas. This initiative was created to enable mass production and to give you some means of subsistence. Prefabrication was also utilized in this project. Duralinium, an extremely light material that can be produced on an assembly line and is air transportable, was used to construct the building.

5.1C FAMES HOUSE

This study examined the potential of prefabricated goods using architectural design as its primary source of inspiration. An asymmetrical prefabricated steel frame supported by the ready-made concrete foundation made up the building. The walls and roof were constructed from steel decking, which was subsequently covered in steel, glass, plywood, asbestos, and plastic panels. This project is an illustration of how commercial materials and methods may be utilized to create something incredibly lovely and straightforward.

5.1D KARALA THEATER

In 1987, Tadao Ando created the Karaza Theater, which was constructed in under 15 days. This structure was constructed using locally accessible scaffolding that was covered in wood. It was somewhat mobile and could be moved from one place to another. It was a building created entirely of regional materials and common parts.

5.1E FLOATING PAVILION

Fumihiko Maki created this pavilion in 1996. It was constructed as a floating experimental pavilion. Due to the transitory nature of the structure, the pavilion's twin spiral canopy, a fairly unusual design for usage in architecture at the time, was made possible.

5.1F SEEDS CATHEDRAL

To promote the seed bank initiative at the Royal Botanic Gardens, Heatherwick Studio created the Seed Cathedral. It took about 5000 wooden staff to build the surface, while the interior was a serene, introspective area illuminated only by night. After the structure was demolished, the seed rods were supposed to be distributed. The ability of this system to demount was a key component. Additionally, it used a very different method of recycling the substance.

5.1G LONDON OLYMPICS

The 2012 London Olympics made use of membranes. Temporary infrastructure was used to construct the basketball arena and three other structures. Different varieties of fabric skin were used to produce outside patterns on a modular framed panel. Here, transportable architecture is used differently by simply moving the distinctive components. Three different projects have all utilized the same steel frame. However, different fabrics were employed for each of the three projects, resulting in the construction of distinct buildings using the same scaffolding.

5.1H EXPERIMENTAL IDEAS

Experimental purchases from various architects allowed it to guide the development of novel concepts. One of the organizations that published a magazine with such intellectual concepts was called Archigram, and it was within that magazine that they created the projects plugin architecture and plug-in city from a walking city. It examined and articulated a variety of themes. These theories' central tenet was a movable lifestyle that changed frequently by requirements. The concepts were founded on a rather nomadic way of life.

The illustration below illustrated earlier practices of pre-fabrication and temporary architecture and what impact they had then. To comprehend the aesthetics and construction of the impermanent building, look at its earliest manifestation. In just six months, Crystal Palace was constructed using brand-new techniques. It was novel in terms of using iron and glass to achieve vast spans. How are important lessons from the Dymaxion home? In this project, prefabrication was used. Duralinium, an extremely light material that can be produced on an assembly line and is air transportable, was used to construct the building. The Eames house illustrates how industrial methods and material selections can be used tocreate a very attractive, straightforward form.

An illustration of how scaffolding may function as actual architecture in the Karaza Theat er. After the structure was demolished, the seed cathedral rods were meant to be scattered. This system's ability to demount was its most noteworthy feature. Additionally, it used a very different method of recycling the substance.

FIG 15: Time of evolution of temporary architecture, (Author's interpretation with the help of (Sravya Sirigiri, 2021))

FIG 5.1: infographic illustrating the evolution of temporary urbanism through time (Author's interpretation with the help of (Sravya Sirigiri, 2021))

CHAPTER 6:

PREFABRICATION & EPHEMERAL ARCHITECTURE

Prefabrication is indeed the method of creating a portion or all of the components for a unit or building in a location other than the planned building site, then integrating and placing these together like that. This is among the earliest building techniques that have been regularly employed throughout history since it is so versatile and has lasted for decades, despite the fact that it would seem to be the product of technical advancement in the modern day. Modular construction has traditionally accelerated and enhanced the efficiency of the construction process, which accounts for its broad acceptance and flexibility. Modular construction speeds up the building procedure and reduces overall building expenses. (Prasher, 2016)

Precast helps to speed up the building project and brings down total construction costs. Since this removes potential elements that may affect the building activities on-site, modular construction is successful. It ensures the quality of the environment and construction materials, which in turn ensures the quality of the building units. (Prasher, 2016)

The value of prefabricated components in construction was already commended for its ability to increase production and efficiency despite lowering quality. Better, quicker, andless costly are values that apply to industrialized nations like the U.S., Japan, and Europe since their common people continue to require this equation in designs that vary from the remarkable to the commonplace. Prefabrication has the potential to make home construction quick and affordable in emerging countries like China, India, Africa, and most of South America. Nevertheless, a greater dependence on produced commodities can have more detrimental than beneficial consequences on these civilizations. (Palanichamy et al., 2002)

It enables a quick construction activity on location, which makes it a useful technique for producing transitory structures. Budlings are frequently designed modularly and preassembled with more accuracy and planning in a controlled environment. Actual time spent on site is reduced and made easier, resulting in a seamless transition between stages of development. (Armada, 2012) Ephemeral architecture and Prefabrication go hand-in- hand, reducing time, and cost and making effective execution. (Jaillon & Poon, 2014)

6.1 PREFABRICATION HISTORICAL CONTEXT

Although there have been changes in its perspective and implementation due to the local materials available and the climatic conditions, prefabricated construction has been a practice since the dawn of civilization. Local conventions, traditions, and beliefs have alsohad a direct influence on the technique. The following categories can be used to analyze the prefabrication methods used by the earliest civilizations:

6.2 PRE-HISTORICAL CONTEXT

Earlier Stone, Bronze, and Iron Ages, the oldest known colosseum, possessed few structural materials and limited construction know-how. As a result, only stone caverns

served as homes during the Stone Age. Tools made of bone, stone, wood, grass, and animal fibers emerged in later cultures. As a result, they were able to construct tupiqs or tents. Early man had learned the method of fastening and jointing while constructing the tools.

Ancient Sri Lanka (3000 BC):

The "Sinhalese monarchs of ancient Sri Lanka" experimented with construction methods 2000 years ago. Building components were individually prepared offsite before being assembled on location. And after many years, we can see that this method of creating separate portions was successful. (Vardia, 2018)

FIG 6.1: Vatadage Temple, Polonnaruwa (Source: www.attractionsinsrilanka.com)

FIG 6.2: Nissanka Latha Mandapaya Polonnaruwa (Source: www.attractionsinsrilanka.com)

Stone Henge, England (3100-Neolithic Period)

The construction of the renowned landmark " Stonehenge" took place over time. Standing stones that are 66 meters tall and set in concentric circles. With foundation planning, a slightly curved lintel created homogeneity. Tenon and mortise joints were utilized to maintain the stability of the construction and assemble the components. (Prasher, 2016)

FIG 6.3: Stone Henge (Source: www.english-heritage.org.uk)

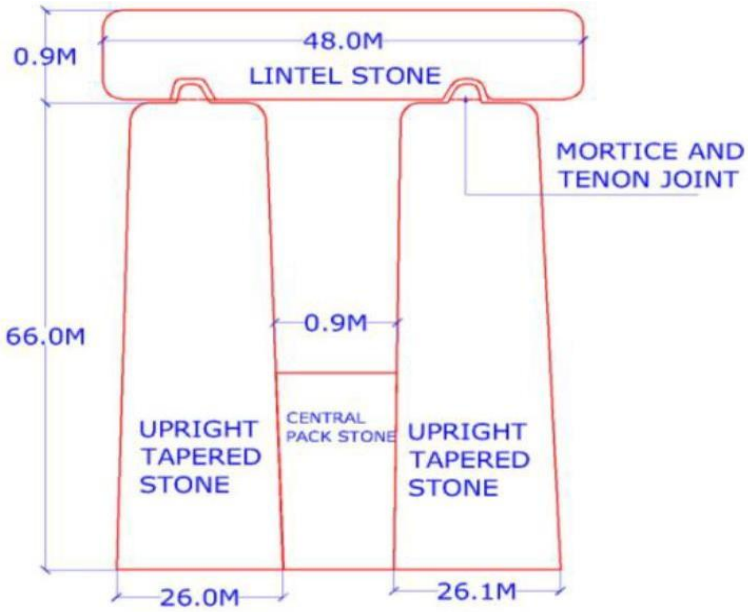


FIG 6.4: Stone Henge Section (Prasher, 2016)

The Sweet Track, England (3800-Neolithic Period)

The earliest artificial track to be discovered is The Sweet Track, that at the moment connected the island at West Hay with a slope of high terrain near to the River Bruce. It was built in 3300 BC. This 1.6-kilometre-long Neolithic construction was constructed using timber frame sections. (Prasher, 2016)

Sr.No.	Structural Components of Sweet Track	Material (Timber)	Size/Dimension	Purpose
1	Planks	Oak(400 years old)	Length - 300cm(3mts) Width - 40cm Thickness -less than 5cm	The platform on which we can walk.
2	Crossed Pegs	Ash, Oak, Lime	-	In the form of a cross to hold a flat walkway.
3	Longitudinal log rails	Hazel & Alder	Length - 610cm(6.1mts) Diameter - 7.6cm	To form the base, laid down in marshland

Table 1. *The Sweet Track Structural Components (Author's interpretation from* (Prasher, 2016)*)*

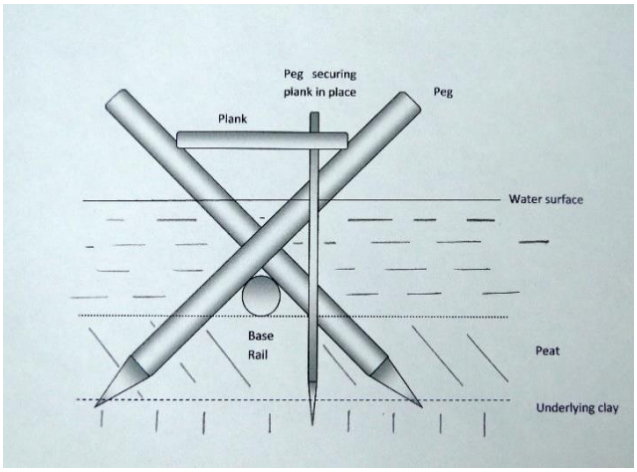


FIG 6.5 & 6.6: Left: The Sweet Track (Source: www.worldhistory.org) Right: Section (Source: wikimedia.org)

6.3 RIVER VALLEY CIVILIZATION

Mesopotamia (2500-600BC)

The evolution of architectural civilization continued with the Mesopotamian civilization. The strategies adopted by the builders of this age were comparable to those of their forebears, but they were applied in a more useful way. They manufactured drywall buildings using this technique. Despite having an Egyptian-inspired design, the blocks were smaller, lighter, and simpler to handle and repair. Their most notable structures were the ziggurats, palaces, and temples. Mud bricks, which are somewhat comparable to adobe, were then usedby craftsmen. Later constructions can also be seen using burnt bricks. This culture createda fascinating bridge-building technique. To do this, large wooden blades the size of nails or screws were used to fasten the wooden planks. (Prasher, 2016)

FIG 6.7 & 6.8: Left: Ziggurat of Ur, Right: Mudbrick (Source: janestreetclayworks.com)

Egyptian Civilization (3000-100BC)

Massive stone slabs were built using these techniques, which were developed during the rise of Egyptian civilization. The artisans had perfected the art of fitting together and arranging very huge stone fragments. The pyramids are a product of this artistic technology. These engineering wonders continue to astound specialists and scientists, who are curious as to how the builders and craftsmen have been able to transport and construct such enormous, large stone blocks while maintaining arithmetical accuracy in their dimensions, shapes, and proportions. These pyramidal constructions are all manufactured in advance. The remaining stone shards still display the butterfly interlocks that were used to fix some of the sculpted shapes from this era. (Prasher, 2016)

FIG 6.9: Luxor Temple (Source: www.ancient-origins.net)

FIG 6.10: Image showing the interlocking of stone blocks and the heavy stone lintels supported onpillars (Source: img.freepik.com)

6.4 HISTORICAL CONTEXT

Vedic Aryan Civilization

The later human race, which emerged during the Vedic Aryan civilization, constructed most of its homes out of thatch and wood. A few of these dwellings featured wooden gates and fences built of timber pieces. They were arranged in groups of three to four cottages. This doorway was an excellent demonstration of how to assemble various sorts of timber parts. Two upright wooden posts joined together with horizontal bamboo bars made up these entrances. These bars were raised so that livestock could pass over them. Later, this style of doorway was transformed into an attractive gateway known as a Toran in the Buddhist culture This shows that modular construction was extensively adopted either by century although it wasn't used for every project. (Prasher, 2016)

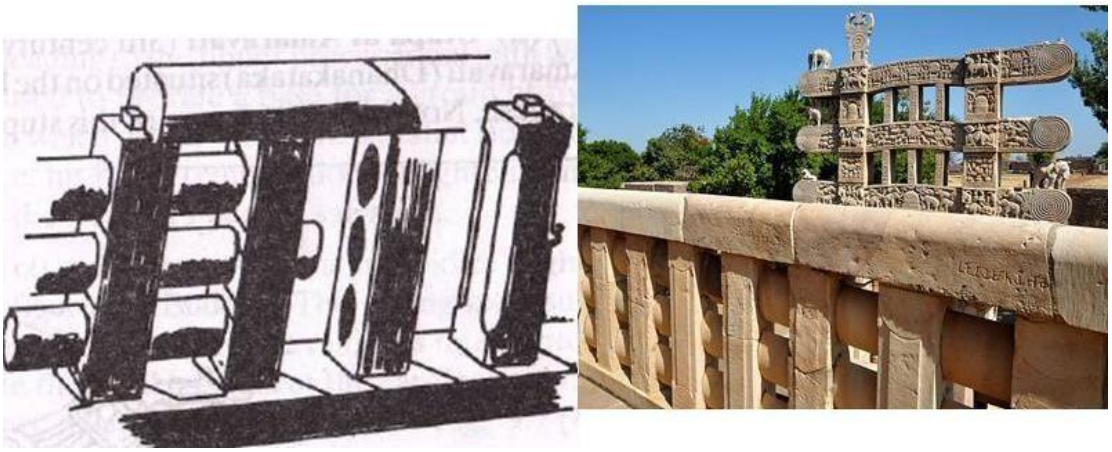


FIG 6.11 & 6.12: Image showcasing the stone baluster and Vedic railing fixing details (Source: www.researchgate.net)

Hindu Temples

Mandir is the usual Hindi name for Hindu temples. The word "mandir" is derived from the Sanskrit word Mandira. In accordance with local and potential outcome, it may be constructed as a stand-alone building or as a component of a larger complex. The overall design of the temple is a reflection of the materials and building techniques used, which vary drastically throughout time. The trabeated method was used to construct the old Hindu temples. The structural load was transferred via the system's horizontal and vertical components. Several pillars or columns, rafters, and slabs were strategically arranged to support the construction. This beam and post system was initially created from the primary building material, wood, and then utilised in stone constructions.(Michel Danino, 2018; Prasher, 2016)

FIG 6.13: The posts and the beams of the temples are examples of prefabricated (Source: wikimedia.org)

FIG 6.14: Stone Chariot at Vittala Temple Hampi Karnataka, Parts of which are Prefabricated.

FIG 6.15: infographic illustrating the evolution of prefabrication through time (Source: Author)

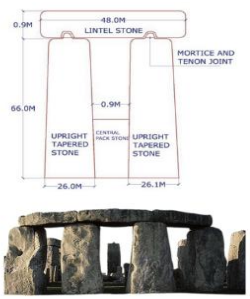
history of pre-fabrication through time

STONE HENGE, ENGLAND

3100
NEOLITHIC PERIOD

The construction of the renowned landmark " Stonehenge" took place over time. Standing stones that are 66 meters tall and set in concentric circles. With foundation planning, a slightly curved lintel created homogeneity. Tenon and mortise joints were utilized to maintain the stability of the construction and assemble the components. (Prasher, 2016)

FIG 16 & 17: Stone Henge & its Sectional Elevation



MESOPOTAMIA
2500-600BC

Mesopotamian civilization represented the next step in architectural civilization development. The approaches used by the architects of this generation were similar to those used by their predecessors but in a more practical fashion. Although it was based on Egyptian work, the blocks were smaller, lighter, and easier to handle and mend. The palaces, temples, and ziggurats were the significant buildings they created. (Prasher, 2016)

FIG 18 & 19 Top: Ziggurat of Ur, Bottom: Masonry mud bricks work

VEDIC ARYAN CIVILIZATION
1500-1100 BC

FIG 21: Sanchi Stupa, Sanchi Town, Raisen district, Madhya Pradesh, India

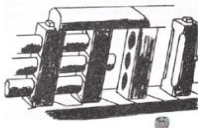


FIG 20: Image showcasing the stone baluster and Vedic railing fixing details --

The later human race, which emerged during the Vedic Aryan civilization, constructed most homes out of thatch and wood. These shelters were grouped in clusters of three to four huts, and some of them had wooden gates and fences made of timber members.

This gateway was a wonderful illustration of how to put together different types of wood pieces. Two upright wooden posts joined together with horizontal bamboo bars made up these entrances.

These bars were raised so that livestock could pass over them. Later, this style of doorway was transformed into an attractive gateway known as a Toran in the Buddhist style.

This demonstrates that the generation widely embraced prefabrication even though not every work was completed using it. (Prasher, 2016)

3000 BC
ANCIENT SRI LANKA

FIG 22 & 23: Showcasing Vatadage Temple, Polonnaruwa & Nissanka Latha Mandapaya Polonnaruwa

The "Sinhalese monarchs of ancient Sri Lanka" experimented with construction methods 2000 years ago. Building components were individually prepared offsite before being assembled on location. And after many years, we can see that this method of creating separate portions was successful. (Vardia, 2018)

3800
NEOLITHIC PERIOD
THE SWEET TRACK, ENGLAND

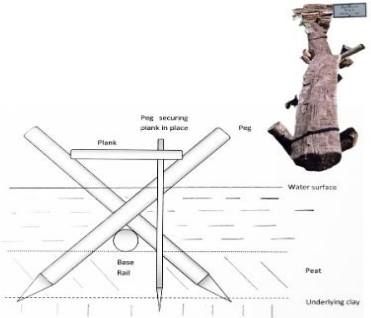


FIG 24 & 25: Top: The Sweet Track, Bottom: Section

The Sweet Track, which connected the island at West Hay at the time with a ridge of high ground close to the River Bruce, is the oldest engineered road known to exist. It was constructed in 3300 BC. The prefabricated timber members were used to build this 1.6 km long Neolithic structure. (Prasher, 2016)

It is an effective method for creating ephemeral architecture because it allows for a swift construction process on site. Building components are frequently designed modularly and preassembled with more accuracy and planning in a controlled environment.

3000-1000 BC
EGYPTIAN CIVILIZATION

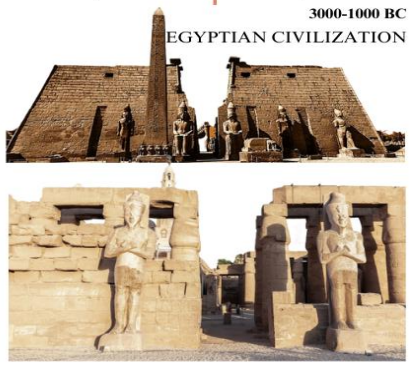


FIG 26 & 27: Luxor temple, showcasing the interlocking of stone blocks and the heavy stone lintels supported on pillars

These methods were created and used in the construction of enormous stone blocks during the expansion of Egyptian civilization. The craftsmen had mastered the ability to combine and arrange very large stone pieces. The result of this aesthetic technology is the pyramids. Scientists and experts continue to be amazed by these engineering marvels and wonder how the workers and artisans were able to move and assemble such massive, heavy stone blocks while reaching mathematical precision in their size, shape, and proportion. All of these pyramid structures are prefabricated. The stone fragments still show how some of the constructed forms from this period were fixed using butterfly interlocks. (Prasher, 2016)

3RD CENTURY BCE ONWARDS
HINDU TEMPLES

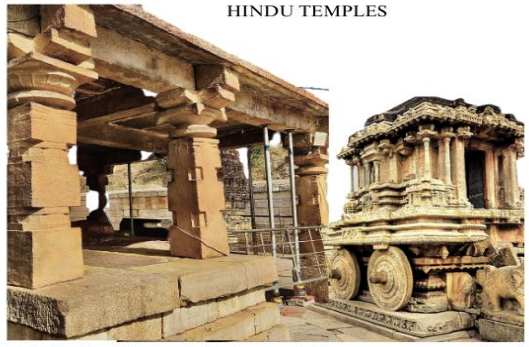


FIG 28: The pillars and the beams of the temples are examples of prefabricated and FIG 29: Stone Chariot at Vittala Temple Hampi Karnataka, Parts of which are Prefabricated.

Hindu temples are commonly known as Mandir in Hindi. The Sanskrit word Mandira is where the word "mandir" originates. It can be built as a standalone structure or as part of a larger complex, depending on local and regional influences. The materials utilized and construction methods used, which vary greatly from period to period, are reflected in the overall appearance of the temple.

The ancient Hindu temples were built using the trabeated system. The horizontal and vertical components of this system were used to transfer the structural load. To sustain the structure, pillars or pilasters, beams, and lintels were organized considerably. This beam and column system was first developed from the fundamental construction material, wood, and afterward applied to stone structures.(Michel Danino, 2018; Prasher, 2016)

6.5 PREFABRICATION IN INDIA

Modular construction in India began with the opening of the Hindustan Housing Factory. The company was established in the 1950s by Pandit Jawaharlal Nehru, India's first prime minister, in response to the housing need caused by the influx of refugees from West Pakistan. The Hindustan Housing Company created the first pre-stressed concrete railway sleepers to replace decaying ones. Timber beds are used by Indian Railways. The company soon rebranded to better represent the scope of its operations. Recently, it has become the Hindustan Prefab Limited, or HPL. Today, the Delhi-based, coalition company prefabricates mostly prefabricated in larger India for structural and design development. (Smith & Narayanamurthy, 2009)

When HPL started, its goal was to create affordable housing options to address India's housing shortage. A crucial set of tools for constructing rapid structures for mass housing was offered by ferro cement paneling as well as structural members for the framework. The cost of production equipment and materials has proven to be HPL's biggest barrier to technology transfer.

Since this administration failed to recoup the payback on capital employed via the production of dwelling, modular construction from HPL began to service alternative industries, including such heavier value civil and greater recreational and hotel facilities. (Smith & Narayanamurthy, 2009)

The construction quality is noticeably better when pieces are made in a sterile situation, like a factory. This is especially true in India, wherein modular construction has become a term for strong, modern, and western building methods. Materials can be reused in the material stream and are used more effectively. They are also safer against climatic deterioration. The general opinion in India is to expand the use of As a consequence of such benefits, pre - engineered technologies have expanded transcend pre - cast for huge development to other market areas, along with a renaissance in awareness in adopting construction methods techniques for dwelling. (Smith & Narayanamurthy, 2009)

For roof spans and other structural systems, traditional construction methods use wooden molds or shuttering. Such transient traditional building materials, with a finite lifespan, typically lack larger, well-funded activities due to the pace of growth although during busy periods of summer and spring. This interferes with building timelines and prevents projects from being finished before the start of the colder or rainier seasons. Despite the shortage of the right tools and materials, construction continues throughout the summer. Instead, impromptu construction techniques on the job site result in improper approaches and, as a result, poor construction quality in completed buildings. The problems of timber molds and shuttering are eliminated by using the prefabricated alternative to roof construction. (Khan & Jain, 2017) Prefabrication enhances uniformity and quality in Indian homes. The problems of timber molds and shuttering are eliminated by using the prefabricated alternative to roof construction. Prefabrication enhances homogeneity in Indian housing while bringing unskilled labor inside where it can be supervised, tracked, and managed.(Smith & Narayanamurthy, 2009)

The market for prefabricated houses has seen material advancements that have lessened material failures. Fly ash is added to concrete to improve thermal performance and make it easier to work with. Fly ash concrete block is also starting to take the place of conventional clay bricks since it doesn't include expanding soils that can cause walls and

flooring to crack when the temperature and humidity change. Fly ash is a byproduct of the coal-burning process used to produce energy, and it is collected and repurposed to create stronger, more stable building materials in a manufacturing setting. Building more seismically resistant structures is made possible by the more predictable material manufacturing process.(Smith& Narayanamurthy, 2009)

By 2010, the Indian government wanted all of its residents to have access to housing. An ambitious project to build new homes is one of the logistics of this endeavor. To constructmulti-family buildings with three to four levels, India intends to complete this task through a surge in prefabrication. An affiliate of Kuwait-based Alghanim Industries, Kirby Building Systems India Ltd. has a cutting-edge manufacturing facility in Hyderabad with the ability to produce 40,000 tons of precast products annually. Additionally, Kirby India has just revealed what it calls a technologically advanced Which was before Metal Building Solution (PEB). In 2004, Kirby completed two structures: a 25 -meter building for something like the North Eastern Council and a 33-meter building for Garden Reach Shipbuilders & Engineers, situated in Kolkata. (Smith & Narayanamurthy, 2009)

A similar prefabricated building framing system is being developed by Minaean Habitat India, a division of Minaean Building Solutions, Canada. It makes use of load-bearing steel panels. The modular building section of Minaean Habitat, which enables buildings to be built, engineered, prefabricated, and made ready for use within four days after arrival at the site, was also recently established. This system has been installed by Minaean in a two-level house development outside of Solapur, Maharashtra. (Smith & Narayanamurthy, 2009)

The HPL and Kirby Building Systems are only two examples of the numerous prefabrication businesses that are sprouting in and outside of India to meet the housing needs of one of the world's most densely populated, economically dynamic, and heavily populated populations.(Smith & Narayanamurthy, 2009)

6.6 PREFABRICATE IN THE CURRENT CONTEXT

Modular construction was a miraculous tool in the arsenal of developers and architects in the past, and it continues to have a strong reputation. No matter how much or how little various civilizations changed the materials they used, prefabrication as technology has endured. The material was directly impacted by socio-cultural, traditional, vernacular, and environmental influences, which resulted in the compositional change. Modular construction has grown out of the need to manufacture more swiftly and wisely, and it will start to expand as new aspects and perspectives are studied. (Hagan FAIA & Box, 2020)

An improvement in product quality is one advantage of prefabrication technology. Construction is carried out using regional materials and techniques in less developed nations like India. In India, the construction industry relies on a lack of precision rather than on it to develop commonplace structures. In India, the majority of residents are skilled in conventional building methods. But there is a growing cultural gap between those who actand those who plan in India. (Li et al., 2014) The structural gap between social classes makes it difficult for the general public to quickly assimilate new building techniques and incorporate them into their cultural construction practices. Some of the major benefits of Prefabrication are shared below;

- The industrialization of the construction industry must include prefabrication. Moving partial assemblies from a plant is frequently less expensive than transporting pre-production materials to distinct locations.
- Prefabricating assemblies can reduce costs by minimizing on-site work while deploying personnel on-site can increase expenses.
- Most effects of weather on output are eliminated by companies' consistent interior conditions.
- Building heat and air can be moved more carefully with the help of higher precision factory machines, resulting in buildings that use less energy and are healthier.
- Factory production can enable better resource utilization, recycling, noise, and dust abatement, among other things.
- Construction safety can be increased by machine-mediated parts movement and freedom from wind and rain.

CHAPTER 7: PRECEDENT CASE STUDIES-LITERATURE

7.1TENT CITY OF MENA-MECCA (HAJJ)

Mina is a tiny city in the Mecca province that is situated approximately 8 kilometers to theeast of Mecca. It is situated in a low-lying valley. This valley is completely covered with tents, which are neatly organized in a grid-iron pattern as far as the eye can see. During these five days of each Hajj season, these tents are converted into adobe homes for the Hajj pilgrims. Mina is avoided for the remainder of the year.

FIG 8.1: Tent City Mena-Mecca (Source: www.islamiclandmarks.com)

As part of their five-day journey, pilgrims from all over the world come here to dwell, leaving aside the conveniences of civilization and dissolving socioeconomic and cultural boundaries. Many pilgrims remain in the tent city, regardless of their diverse cultural or socioeconomic origins; the average cost per traveler is 5,500. The majority of these tents have air conditioning and hold about 50 people.

On the fields of Mina, pilgrims once brought and pitched their tents. This tradition persisted for perhaps a century. Up until the late 20th century, when the Saudi government set up permanent Compton tents to lessen the load of carrying their own pilgrims. the current vest badges for the tent city. After a terrible fire killed 350 pilgrims in 1997, walkways andmedical facilities were constructed.

Earlier Days-Materials Used in the Settlement

The 8m by 8m tents are made of Teflon-coated fiberglass, which is fire-resistant. As a precaution, the tents were made fire-resistant after a terrible fire in Mina in 1997 claimed the lives of 350 pilgrims. Three million pilgrims are housed in more than 100,000 air-conditioned tents.

Current Development in Mena

Pilgrims make up the bulk of travelers to Saudi Arabia. In particular, non-Muslims are not permitted in Mecca. Mecca is crowded with visitors and pilgrims throughout the year, with up to 20 million people visiting the city, not only during the Hajj season when it can house 3 million pilgrims. In order to make room for infrastructure to accommodate pilgrims, the government was forced to remove residential infrastructure and historical sites.

Because of this, the city of Mecca has experienced significant growth in both size and infrastructure over the past few years. The Makkah Royal Clock Tower Hotel: Jabal Omar development, in which 40 residential towers that will accommodate 160.000 Islamic pilgrims and a prayer area for 200,000 worshippers have been proposed; Jeddah Tower; The Abraj Al Bait, a mega complex consisting of seven skyscraper hotels that overlook the
Kaaba; Irfan al-Alawi, executive director of the UK- based Islamic Heritage Research Foundation, was quoted as saying that the irony is obvious. **It is the end of Mecca, and for what? Most of these hotels are 50% vacant and the malls are empty** — the rents are too expensive for the former souk stall-holders. Additionally, those who are worshipping within the new mosque extension won't even be able to see the Kaaba.

Current Issues

As a result of this, in the past few years, the city of Mecca has seen tremendous expansion in size and infrastructure. The Abraj Al Bait, a mega complex consisting of seven skyscraper hotels that overlook the Kaaba; the Makkah Royal Clock Tower Hotel: Jabal Omar development, in which 40 residential towers that will accommodate 160.000 Islamic pilgrims, and a prayer area for 200,000 worshippers have been proposed; Jeddah Tower are some of
But the irony is evident as quoted by Irfan al-Alawi, executive director of the UK-based Islamic Heritage Research Foundation. "It is the end of Mecca; and for what? Most of these hotels are 50% vacant and the malls are empty — the rents are too expensive for the former souk stall-holders. And people praying in the new mosque extension will not even be able to see the Kaaba."'

Fig 8.2: Waste Management & Casuality issues (Curtsey: i.dailymail.co.uk)

Fig 8.3: Using fabric, issues of immense fire in past decades (Curtsey: gdb.voanews.com)

Fig 8.4: Huge investment for a 5-day fest (Curtsey: www.sl-rasch.com)

Fig 8.5: Numerous accidents and injuries face Hajj pilgrims, such as falling, sliding, stampedes, and traffic accidents. Most of the traumas usually occur during the rituals of Tawaf, Saee, and Ramy al-jamaat. (Curtsey: www.aljazeera.com)

The Past

Pilgrims from around the world, irrespective of their cultural and financial backgrounds, stay in a tent city during their five-day pilgrimage, leaving behind the comforts of civilization. The average cost per pilgrim is approximately $5500. In the past, pilgrims used to bring their own tents to Mina, but the Saudi government later provided permanent cotton tents to alleviate their burden. The present tent city is fire-proof and includes lodges, walkways, and health facilities, built after a tragic fire in 1997 that resulted in the loss of 350 lives. These tents are designed to accommodate around 50 people each.

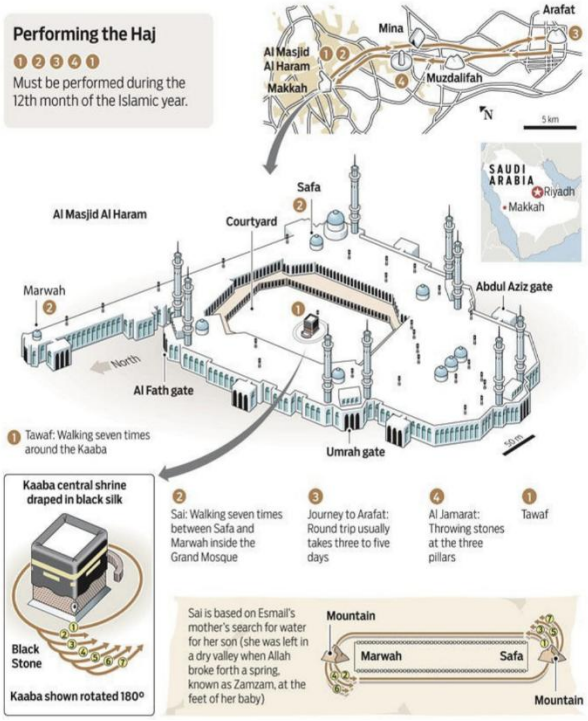


Fig 8.6: Route of Hajj (Curtsey: indianexpress.com)

Is Permanence the only Solution?

FIG 8.7: The central hotel towerthe Makkah Clock Royal Tower (Source: au.trip.com)

7.2 BURNING MAN FESTIVAL-USA

As per the Burning Man official website

Burning Man is a global ecosystem of artists, makers, and community leaders that collaborate to co-create art, events, and local initiatives all over the world. This ecosystem is driven by the values embodied in the 10 Principles. Most famously, tens of thousands of Burners assembleeach year to construct Black Rock City, a collaborative transit hub in the Nevada desert.

A network of regional Burning Man communities in more than 40 US states and 35 other countries are supported year-round by the charity Burning Man Project, which also organizes the yearly Burning Man festival in Black Rock City. Their goal is to facilitate and spread the Burning Man culture throughout the rest of the world.(Hagan FAIA & Box, 2020)

FIG 8.3: An Arial view of Burning Man Festival from Nevada, USA (Source: www.rferl.org)

What is it?

The core values of the burning man festival are people's natural self-expression and independence because the festival's yearly temporary community is built and curated by its visitors' interactions, art, and performances.

Setting up this Temporary City

Burning Man's spatial, organizational, and aesthetic aspects all ring true with its critical viewpoint. The monolithic main stage of a typical music festival is glaringly lacking in this event, which is taking place in a parched area of the Nevada desert. Instead, the area is filled with geodesic structures, modest tents, and neighboring concentric and radial roads. Art installations alone are permitted on an"open playa". On the playa surrounding the event site, the BLM (U.S. Bureau of Land Management) creates a buffer zone; camping is not permittedin this region.

Black Rock City is the creation of Rod Garrett. Together with Larry Harvey, Will Roger, andHarley Dubois, he designed it. Garrett created The Center Camp and The

Temple of Enlightenment in 2001. Rod's Road is the name of the circular street Garrett created around Center Camp in recognition of his significant contributions to the Burning Man community.

A semicircular arrangement of buildings houses the "Man," a towering effigy that has been expertly built, in the center of the model. Instead of longitude and latitude, there are "times" on a "clock." On a clock-face map that is handed out to visitors as they arrive, hundreds of things are noted that lack distinct boundaries on the land except improvised signage. The "central camp" is the hub of activity within the encampments and the only location on-site where it is possible to make purchases, but these are only limited to coffee and ice. It is represented by the white circle just beneath the image of the man.

Civic Plazas

Civic plazas are gathering spaces where people engage in activities to make the area livelier and more dynamic. Such gatherings are encouraged to take place at camps that are situated just around these plazas. First Aid facilities, service camps, art projects, and Black Rock Ranger outposts are all housed at these locations. The first set of municipal plazas is located at 3:00 and 9:00 on Breath Street, respectively, on opposite ends of the city. At 3:00, 4:30, 7:30, and9:00 on Genuflect Street, and 6:00 on Inspirit Street, there are plaza rings in the middle of thecity. Walk-In Camping is permitted in a sizable area between 2:00 and 5:00 past Lustrate Street. The absence of cars when camping keeps Walk-In Camping relatively unpopulated due to its sheer difficulty.(Hagan FAIA & Box, 2020)

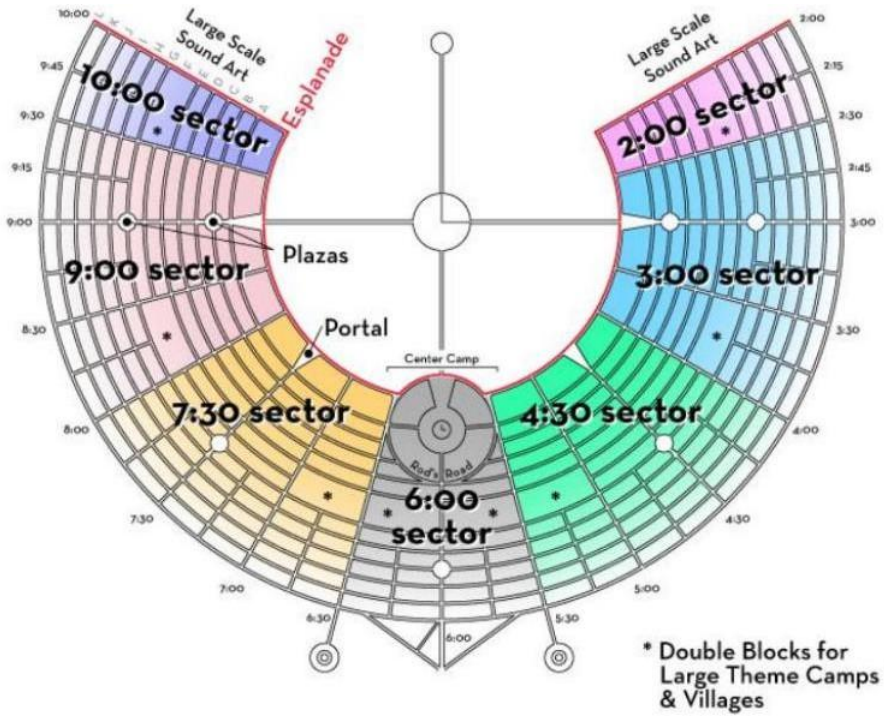


FIG 8.4: The figure above is a simplified portrayal of the site's basic layout. (Source: www.insider.com)

Building Typologies

Because Burning Man is a participant-driven event, there are no standardized lodging options or tents that are used each year. As a result, there are numerous temporary accommodations on the property. Most of these are simple tent variations made by hand.

People develop their suggestions for a more comfortable stay, which in some ways also reflects their personalities. Even outside of the event, a few of these concepts have gone onto achieve significant popularity. Their applications and uses go beyond what is required for the festival. Here, a handful of these typologies are examined. The Hexayurt is a straightforward, open-source, free shelter that can be used in various applications instead ofa tent

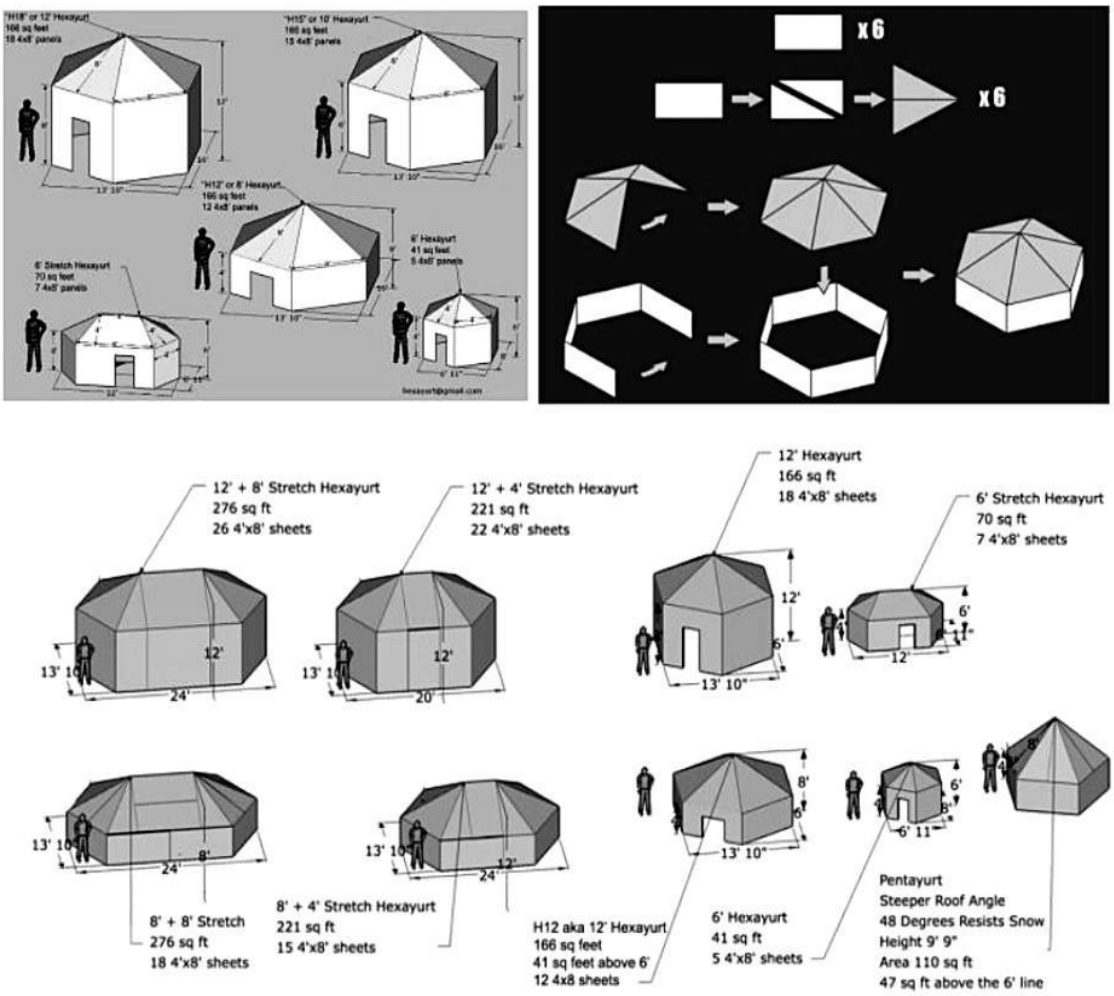


FIG 8.5: *Different Types of Hydrants from the festival. (Source: www.insider.com)*

Emergency Medical Services

Medical Emergency Services It is advised that participants bring their first aid supplies and prescriptions, drink enough water, and behave appropriately. For emergencies, there are six medical stations positioned at 5:15 and Esplanade and behind the 3:00 and 9:00 Plazas. Additionally, there are three smaller satellite stations between the Temple and the Man and behind the 4:30 and 7:30 Plazas on H. The camps are marked by a huge red cross that is brightly lit. For assistance in emergencies, you can also get in touch with Black Rock Rangers or volunteers from the Emergency Services Department.

Press & Media

To take any commercial recordings or photographs that are not for personal use, you must first obtain written permission from the relevant authorities. Found & Lost The Playa Infosite's Lost & Found department maintains an inventory of all lost items.

Center Camp Café

The Center Camp Café is a geometric building that is constantly busy with activities throughout the day. You can buy coffee, tea, and other non-alcoholic beverages here. The Café has excellent performance and art spaces, as well as rest areas. Consequently, it serves as a hub for interaction among the burning man community. Frequently, other participants will perform.

How Sustainable is the Fest?

The Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area is the setting for the Burning Man Festival. This is a piece of what is known as the National Conservation Areas in the United States, which are some of the most beautiful, culturally diverse, and scientifically significant public lands in the nation. Therefore, the event shares a similar commitment to cherishing and preserving this unique location.

Consequently, Burning Man is the biggest "Leave No Trace" (LNT)" event worldwide. The task of clearing Black Rock City of any "Matter Out of Place (MOOP)" falls on all participants (BRC). BRC doesn't offer rubbish collection services. Everything one brings could end up becoming trash. the U.S. Bureau of Land Management's (BLM) permission for the festival. The playa can only be returned to its pre-festival state for a very brief period, per the festival's permission with the BLM (U.S. Bureau of Land Management).

In addition to their camp clean-up, the participants are expected to help their fellow BRC residents on Sunday and Monday after the Bum for two hours of Moping.(Hagan FAIA &Box, 2020)

Can Impermanence be the Solution? And how efficient is an individual in comparison to the organizers of an event?

CHAPTER 8: PRECEDENT CASE STUDY-LIVE

RANN UTSAV, KUTCH, GUJARAT (LIVE CASE STUDY)

Culture is the life lived by a group of people living in a specific region and the patterning of it. India‘s culture is among the world's oldest, civilization in India began about 4,500 years ago. Many sources describe it as "Sa Prathama Sanskrati Vishvavara" — the first and the supreme culture in the world, according to the All World Gayatri Pariwar (AWGP) organization. (http://www.livescience.com). Tourism means a visit by an outsider to the host culture and making an attempt to learn about the host culture through festivals, arts and crafts, sculpture and architecture, etc. There has been a lot of debate, of late, over the increasing importance of cultural tourism as a showcase of the local culture by outsider tourists.

Rann Utsav started in 2005 and is celebrated from every full moon day in November / December and lasts for more than two months. Tourist visits this place to experience the diverse traditions and the generosity and hospitality of Kutchchh. The main attraction is the White Desert. A grand tent city having about 300 tents is set up at Dhorado, 85 km from Bhuj. The experience of Snow White desert gleaming like silver on a moonlit night intoxicates a person. Together with White Desert a test of Kutchchhi art, culture, and literature also attracts visitors.

FIG 8.8: Master Plan of Rann Utsav 2023, Source: Author’s Capture

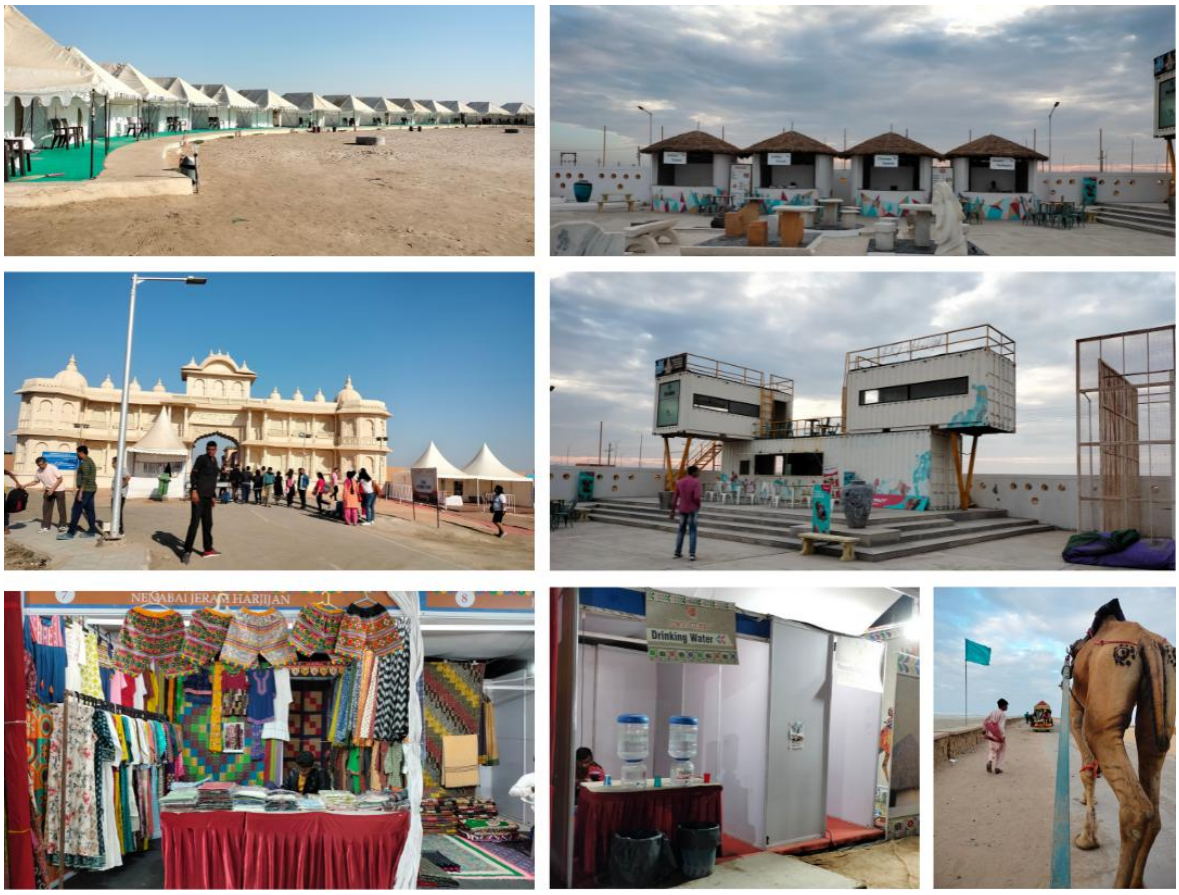


FIG 8.9: Pictures of Rann Utsav 2023, Source: Author's Capture

Rann Utsav has the following attractions.

- Camel Cart Ride
- Shopping Activity Area Bandhini Sarees, Handicraft Items & many more traditional items.
- Kids Zone Area
- Food Court
- Gaming Zone
- Spa Centre on a chargeable basis
- Yoga & Meditation Centre
- Adventurous Activity on a Chargeable basis Parasailing, Dirt Biking.
- Cultural Dance Performance
- Live Music Concerts
- Special Cultural Dance Shows, Garba, Dandiya Raas
- Conference hall for Business purposes
- Rides on a chargeable basis
- Optional Tours Visit on Chargeable Indo Pak Border, Mandavi Beach
- Sightseeing Visit Kaladungar / Black Hill, White Rann / Desert, Hodka Village
- Library

Every destination has its own life cycle, some sustain for a long time and others for a short span. For a long life cycle, there is a need to assess destinations' strengths, weaknesses, opportunities, and threats. Through assessment, destination development planning may be

sustainable and planners work according to their strengths and weakness. Rann Utsav's SWOT analysis is described below.

Strengths of Rann Utsav :

- Handicrafts promotion for local communities
- Stunning views of sunset, sunrise, and full moonlight on white sand
- Unique location at the Indo-Pak border, including Kala Dungar
- Effective marketing, including celebrity endorsements
- Authentic Kutchi cuisine for a culinary experience
- Celebration of fairs and festivals for cultural immersion
- Attractive accommodation options with luxury tents, Bhungas, and homestays.

Weaknesses of Rann Utsav :

- Limited transportation facilities, including air taxis and trains, impact accessibility
- High accommodation costs during Rann Utsav, affecting affordability
- Increased costs during peak season due to high demand
- Lack of proper infrastructure in rural locations, including drinking water, hospitals, sewage, telecom, lighting, and roads
- Cleanliness issues due to lack of facilities like dustbins and sewage.

Opportunities of Rann Utsav :

- Job creation for local communities, contributing to tourism industry growth.
- Diversification by introducing new cultural activities or attractions for a wider range of tourists.
- Sustainability approaches, including infrastructure and cleanliness improvements, to enhance tourist experience.
- Collaboration with local communities and stakeholders for addressing weaknesses and exploring new opportunities for growth.

Threats of Rann Utsav :

- Congestion in peak season may affect tourist flow
- The sustainability approach may be ignored for quick development
- Social evils- drug addiction, crime, prostitution
- Terrorism
- Cultural disturbance
- Xenophobia
- Natural calamity

CHAPTER 9: DISCUSSION

9.1 DISCUSSION ON PERMANENCE & IMPERMANENCE

We frequently consider architecture to be enduring and to aspire to the status of a monument. Additionally, that kind of architecture has a place. But so does diverse kinds of architecture. (Long & Hadley, 2016)

The statement building dominated architecture for the majority of the first decade of the twenty-first century. The goal of the design was to leave a lasting mark, whether it was with a contentious memorial or an extravagant condo complex. Although it has always been, should architecture be associated with permanence?

In the case of an example like Kumbh Mela, being aware that the city will reverse, be dismantled,and vanish causes humans to expend a tremendous amount of energy and creativity. It is a fleetingmegacity. It also offers important lessons for us to learn. Lessons on reversibility, disassembly, and how to delicately touch the earth. On the other hand, the entire Mena Tent City is being planned to be kept inside a single high-rise which again becomes a permanent structure.

We, as humans are obsessed with permanence. We battle change. We all experience the urge. Andeven though change is likely the only constant in our life, we nevertheless struggle with it. Even the spaceship, Earth, and our planet have a shelf life.

So, what can we infer about settlements of this nature? Of course, Burning Man is considerably smaller but reversible. Or the countless transaction markets that pop up all over the world.

From the readings & literature reviews, I can now say that permanence & impermanenceare two sides of a coin, we flip it as we need and the contextual part defines the application of it. Mass housing, leaves individuals with Highrise possibilities, on the other hand, the park next brings new possibilities for temporal urban forms to breathe.

I would leave the reader with some questions to be self-answered. Do we create lasting answers for transient issues in our cities and our urbanist imaginations? Are we investingresources in paradigms that we don't even know will still be valid in ten years? This investigation leads to what I believe to be an intriguing question.

9.2 DISCUSSION OF LITERATURE REVIEW & FINDINGS

OB-Q1*: Can Ephemeral Prefabricated Architecture be the new way spaces are designed?*

With the established research, it can be said that the built environment is essential for providing homes for this expanding urban population and for addressing rising rates of displacement, but it is not entitled to the indiscriminate use of resources to satisfy humanitarian needs. Understanding theuse of materials in construction and the reasons behind it can open up new potential for practice styles that are more in line with long-term sustainability objectives.

The favelas in Latin America and the slums of Mumbai. The ad hoc in this case is evolving into the new permanent. Here, urbanization is about major modification rather than big vision. During the Ganesh celebration, the street in Mumbai undergoes a metamorphosis, and a community hall is built. Bollywood movies are screened for 10 days, and hundreds gather for festivities and meals. It is disassemblable and constructed of Ganpati Bappa, a machete, and plaster of Paris. And after 10 days, it vanishes overnight, returning the street to its previous state of obscurity or beautiful openareas.

Certainly, with the literature reviews and readings, it can be justified that, user demand is never stagnant, thus, concrete loses its rigidity here and a new ephemeral urban city/form is needed to adapt as per the requirements at the given point in time, usability and resource utilization depends on context.

It is evident that architectural permanence rarely longer translates to material endurance. In a culture where relativity governs, this idea might be reinterpreted to incorporate social and cultural endurance as essential elements of architectural longevity. The built environment exists in a variety of impermanent states, which we as designers should be aware of and account for in our designs. The only thing that is genuinely permanent is the devastation we inflict.

OB-Q3*: What role does Pre-Fabrication play in these Vaporizing Structures? What areits benefits?*

Starting from the start, the Crystal Palace and Britain's Great Exhibition of 1851 are what connect prefabrication to pop-up/temporary architecture. According to the "Prefabrication Modularization: Increasing Productivity in the Construction Industry" McGraw-Hill Smart Market Report.

Iron, wood, and glass were employed to design the Crystal Palace, which took less than two weeks. The prefabricated components were assembled throughout the brief building period, which lasted only a few months. Following the exhibition, the palace was disassembled piece by piece and relocated.

But as I studied prefabrication's history, I quickly discovered how similar the two ideas were. For instance, Samuel Wyatt showed the king in the 1780s how a prefabricated hospital could be pulled down and set back up in a matter of an hour. How similar is that to the Pop- up idea? And the best application of the same was even seen during the covid era. This pandemic taught us the lesson that nothing in this world is permanent and change is the only stagnant floating.

But Pre-fab also poses the question of "Is it safe?" With refabricated towers and skyscrapers currently in the projects (and, in some circumstances, going up in as short as six days). Doprefabricated buildings that are produced quickly become unstable and more prone to falling? This was answered in table 2-4, 04 literature review where the existing and well- working examples are standing on the site and serving the defined purpose.

Prefabrication literature reviews showcase that, it is the most appropriate and condition- oriented urban form construction technology, helps in reducing waste from the construction site, and is a highly sustainable & economical approach for modularization. In essence, prefabrication and pop-up buildings have a huge potential to alter the standards and procedures of architecture, buildings, and the physical environment.

OB-Q2*: Can tools, techniques & materials bring a change here?*

Certainly, with precedent studies and literature reviews, it is established that the correct use of materials & planning techniques is a change ben we brought to the current existing system. (Anja Pirjevec, 2021) This is answered in detail below (9.3)

CHAPTER 10: KUMBH MELA

10.1 PILGRIMAGE

A pilgrimage is defined as a physical journey to significant or sacred locations combined with an introspective inquiry into one's own mind and consciousness and interactions with the timeless and miraculous. It is a metaphorical internal voyage that might be a spiritual or existential search for wisdom, wholeness, or self-understanding. (McIntosh, Haddad, & Munro, 2019; Tamashiro, 2018, Divya BR & Keshavamurthy, 2020).
The holy places fill our needs on a social, personal, and spiritual level as an anomaly in the world. As a witness affirmation and witness-bearing to the existential significance, dignity, and humaneness for the individual and collective, pilgrimage is based on the sense of a connected universe. (McIntosh, Haddad, & Munro, 2019; Tamashiro, 2018, Divya BR & Keshavamurthy, 2020).

Fig 10.1: Author's interpretation of Pilgrims

10.2 WHAT IS KUMBH ?

The Kumbh Mela is a Hindu religious gathering that takes place across India in four different cities along the Holy Rivers of India. It is a riverbank festival that honors the holiness of the confluence of the sacred rivers Yamuna, Ganga & Saraswati at Prayagraj, it is an occasion to take a bath and venerate the sacred rivers. It is one of the oldest religious gatherings along the river and a significant Hindu pilgrimage site; yet, it is not for a temple or a god (Atmashraddha, 2010a; Narain, Narain, & Burchett, 2010).

One of the biggest religiously peaceful gatherings ever is known to have taken place there. Kumbh Mela is a major pilgrimage and festival in Hinduism. It is celebrated in a cycle of approximately 12 years, to celebrate every revolution Brihaspati (Jupiter) completes (Divya BR & Keshavamurthy, 2020). Kumbh Mela at Prayagraj is celebrated approximately 3 years after Kumbh at Haridwar and 3 years before Kumbh at Nashik and Ujjain (both of which are celebrated in the same year or one year apart)

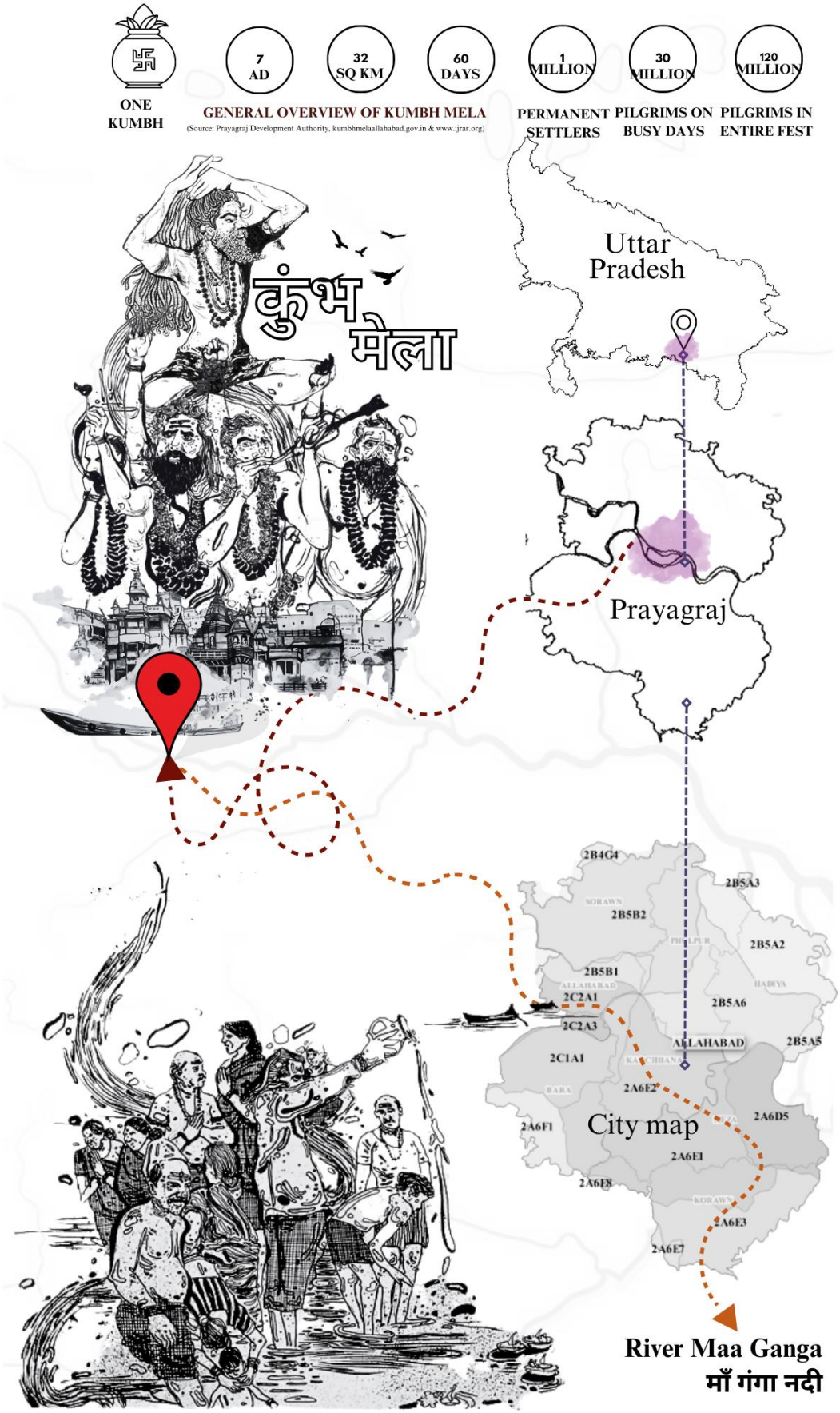


Fig 10.2: Author's interpretation of Prayagraj & Kumbh Mela

10.3 KUMBH & ITS ASTROLOGICAL CONJUNCTION

The Kumbh Mela is a Hindu pilgrimage that occurs every 12 years when Jupiter is in Aquarius and the Sun enters Aries, as mentioned in the Skanda Purana. The significance of taking a bath and drinking the sacred waters during this auspicious time is mentioned in the Puranas. The mela in Prayagraj has been happening since the Gupta dynasty, and the Chinese Buddhist monk Hsuan Tsang provided the first historical account of this massive gathering in 643 CE. The Kumbh Mela involves austere displays of yogic performance, reading of sacred texts, discussions on socioreligious issues, and sectarian propaganda. The intervention of the colonial administration in 1870 made the pilgrimage safer and encouraged more attendance at the Kumbh Mela. (Divya BR & Keshavamurthy, 2020).

10.4 HISTORICAL & CULTURAL BACKGROUND

The Kumbh Mela, which means "pitcher fair" in Sanskrit, has historical significance as a major Hindu pilgrimage where Hindus travel to India to take holy river baths and partake in the mela lifestyle. The Tirthas, or places of worship, along the banks of the holy rivers, are believed to amplify prayers, kindness, and penitential moments. Prayag, also known as Tirtha Raj, is the city where the Ganga, Yamuna, and Sarasvati rivers converge in a confluence known as Sangam. During the auspicious time of the Kumbh Mela, it is believed that the rivers flow with Amrit, the "nectar of immortality." In the 1870s, the Kumbh Mela was more frantic and risky, leading to intervention by colonial authorities to ensure safety and boost attendance.

Fig 10.3: Kumbh Mela Painting, by the English painter J. M. W. Turner. Steel engraving, 1850s. (curtsey : commons.wikimedia.org)

Fig 10.4: Kumbh Mela 2019 (curtsey : commons.wikimedia.org)

Below, Side : Magh Mela 2023, Author

10.5 RIVER GANGA

The river Ganga holds significant religious and cultural importance in Hindu mythology. It is formed by the union of two tributaries, Bhagirathi and Alaknanda, at Devprayag. Considered as one of the holiest rivers in India, the Ganga is believed to have purifying properties that cleanse people of their sins. It originates from the Gangotri glacier in the Himalayas and flows through the plains, providing livelihood to millions of people through agriculture, fishing, and tourism. The Ganga is also associated with Hindu festivals like the Kumbh Festival, which is celebrated annually on its banks and includes the performance of Ganga Aarti, a holy worship ritual.

The river Ganga is the second most polluted river in the world. In order to cleanse it, the Ganga Action Plan was formulated in 1986 which failed epically. However, the Namami Gange program is an ongoing cleaning initiative that has been successful in cleaning the water. The river Ganga has been threatened by pollution for decades now and it is crucial that we work diligently to prevent it from being damaged all the more. If we succeed in saving the river, we would succeed in saving many lives and eradicating other means of pollution too.

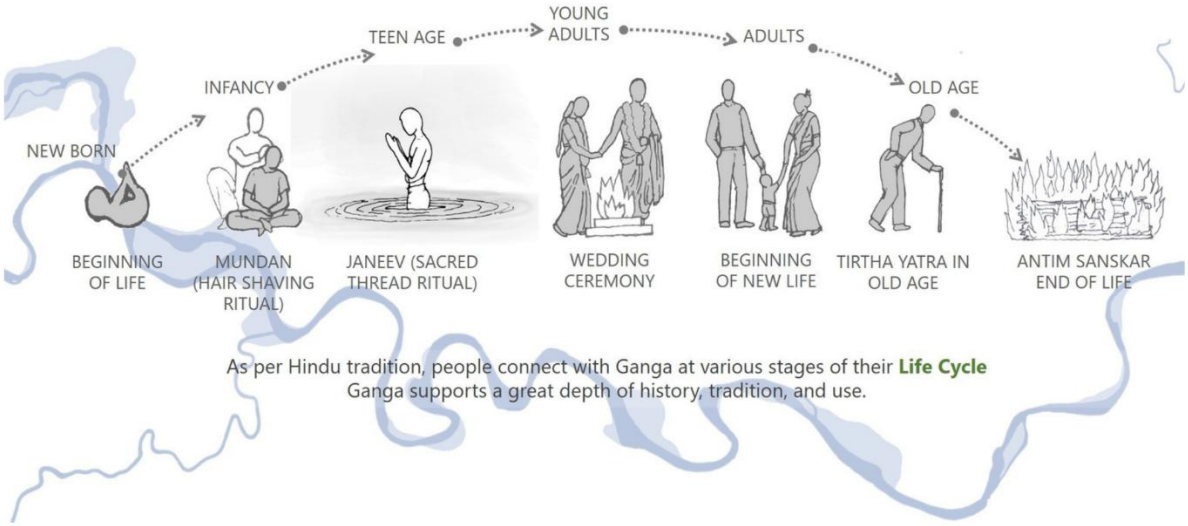


Fig 10.5:River Ganga, Image Courtesy to Morphogenesis

10.6 WHY KUMBH MELA IS SPECIAL?

The Kumbh Mela is a paradigm study that illustrates how certain systems may be utilized for disaster response, teaching a huge number of people about sustainable living practices, and low-impact and cost-effective urban architecture. Where might ephemeral or adaptable urbanism replace the gaps now if we accept that some elements of "permanent" 20th-century design have failed? Can this be used in conjunction with urbanism? We argue that the problems raised above do have spatial impacts, ramifications, and repercussions, despite the fact that some are obviously not architectural.

In order to make this material accessible to a larger demographic interested in urban planning for vast and changing populations, it is our responsibility as designers to make it comprehensible using the methods of our professions.

At the Kumbh Mela, many opposing systems, issues, and difficulties collide. The event's complexity calls for an interdisciplinary investigation. In order to learn more about how the many institutions in the city interact with one another and how the various disciplines may provide an integrated collection of perspectives about the city and the festival, we want to develop numerous viewpoints on the Mela and customize our hypotheses to each one.

10.7 FACTS ABOUT KUMBH MELA

The Kumbh Mela is classified as follows:

- The Purna Kumbh Mela (sometimes just called Kumbh or "full Kumbha"), occurs every 12 years at a given site.
- The Ardh Kumbh Mela ("half Kumbh") occurs approximately every 6 years between the two Purna Kumbha Melas at Prayagraj and Haridwar.
- The Maha Kumbh occurs every 12 Purna Kumbh Melas i.e. after every 144 years.

SR. NO.	PLACE	RIVER	ZODIAC	SEASONS / MONTHS
1	Haridwar	Ganga	Jupiter in Aquarius, Sun in Aries	Spring, Chaitra (January–April)
2	Prayagraj	Ganga and Yamuna junction	Jupiter in Aries, Sun and Moon in Capricorn; or Jupiter in Taurus, Sun in Capricorn	Winter, Magha (January–February)
3	Trimbak-Nashik	Godavari	Jupiter in Leo; or Jupiter, Sun and Moon enters in Cancer on lunar conjunction	Summer, Bhadrapada (August–September)
4	Ujjain	Shipra	Jupiter in Leo and Sun in Aries; or Jupiter, Sun, and Moon in Libra on Kartik Amavasya	Spring, Vaisakha (April–May)

SR. NO.	**NASIK SIMHASTHA KUMBH 2015**	**UJJAIN SIMHASTHA KUMBH 2016**	HARIDWAR ARDH KUMBH MELA 2016	**ALLAHABAD ARDH KUMBH MELA 2019**
1	100 million	75 million	107 million	150 million
2	No permanent location is observed and does not feature Ardh Kumbh Mela	Does not feature Ardh Kumbh Mela.	Organised on the banks of river Ganga.	Organised at Sangam, the confluence of three of the holiest rivers Ganga, Yamuna and Sarasvati.

SR. NO.	**INFRASTRUCTURE**	**UNIT**	KUMBH 2001	**ARDH KUMBH 2007**	**KUMBH 2013**	ARDH KUMBH 2019
1	Area	Hectare	1495.31	1613.80	1936.56	3278.30
2	Sectors	Number	11	11	14	20
3	Length of road laid	Km	96.50	116.50	156	254

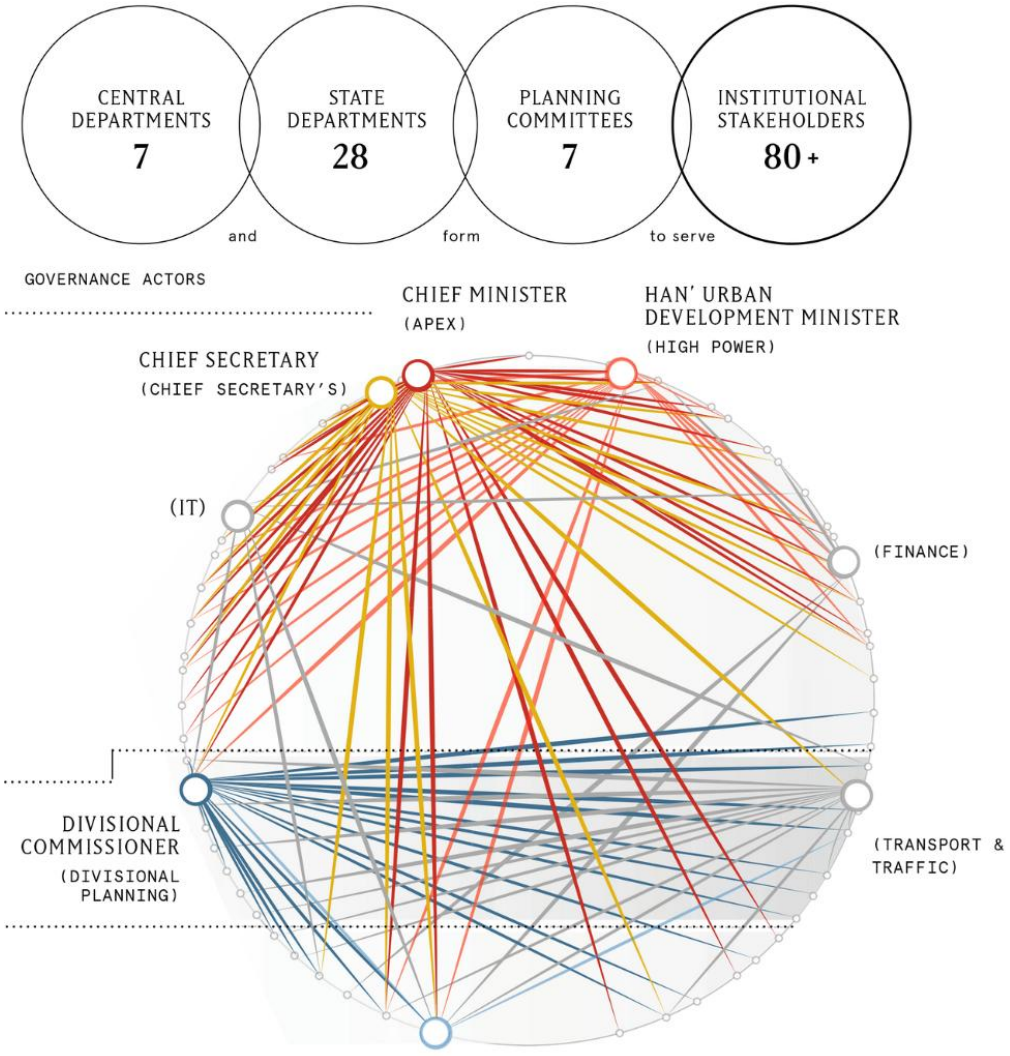
KUMBH MELA LAND USE PATTERN
(Source:- kumbhmelaallahabad.gov.in & www.ijrar.org)

Population (2019)	150,000,000
Forecasted Population (2025)	209,583,334
Area	32.783 Sq. Km
Number of Sector:	20
Number of Houses:	130,053,000
Total road length:	308 KM

POPULATION GROWTH AND DENSITY

(Source: Prayagraj Development Authority & www.ijrar.org)

10.8 GOVERNANCE AND WORKFLOW STRUCTURE OF KUMBH MELA



CHAPTER 11: CONTEXTUAL STUDY OF KUMBH MELA

*NOTE: This study was done with the help of a book written by Rahul Mehrotra & Felipe Vera and Image; *A*, adapted as it is from the book for study purposes, the book is titled:" Kumbh Mela | Mapping the Ephemeral Megacity" and Images *B* & *C*; are adapted as it is from a study conducted by students of TU Delft.*

11.1 CONTEXT & CONNECTIVITY OF THE PLACE

The Kumbh Mela is a paradigm study that illustrates how certain systems may be utilized for disaster response, teaching a huge number of people about sustainable living practices, and low-impact and cost-effective urban architecture. Where might ephemeral or adaptable urbanism replace the gaps now if we accept that some elements of "permanent" 20th-century design have failed? Can this be used in conjunction with urbanism? We argue that the problems raised above do have spatial impacts, ramifications, and repercussions, despite the fact that some are obviously not architectural. place the gaps now if we accept that some elements of "permanent" 20th-century design have failed? Can this be used in conjunction with urbanism? We argue that the problems raised above do have spatial impacts, ramifications, and repercussions, despite the fact that some are obviously not architectural. place the gaps now if we accept that some elements of "permanent" 20th-century design have failed? Can this be used in conjunction with urbanism? We argue that the problems raised above do have spatial impacts, ramifications, and repercussions, despite the fact that some are obviously not architectural.

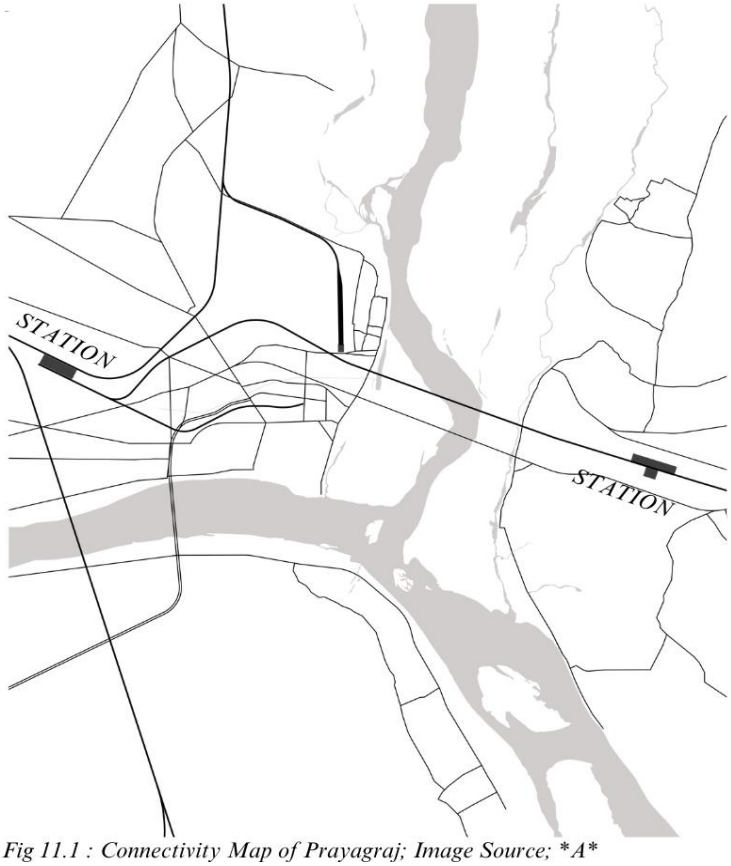


*Fig 11.1 : Connectivity Map of Prayagraj; Image Source; *A**

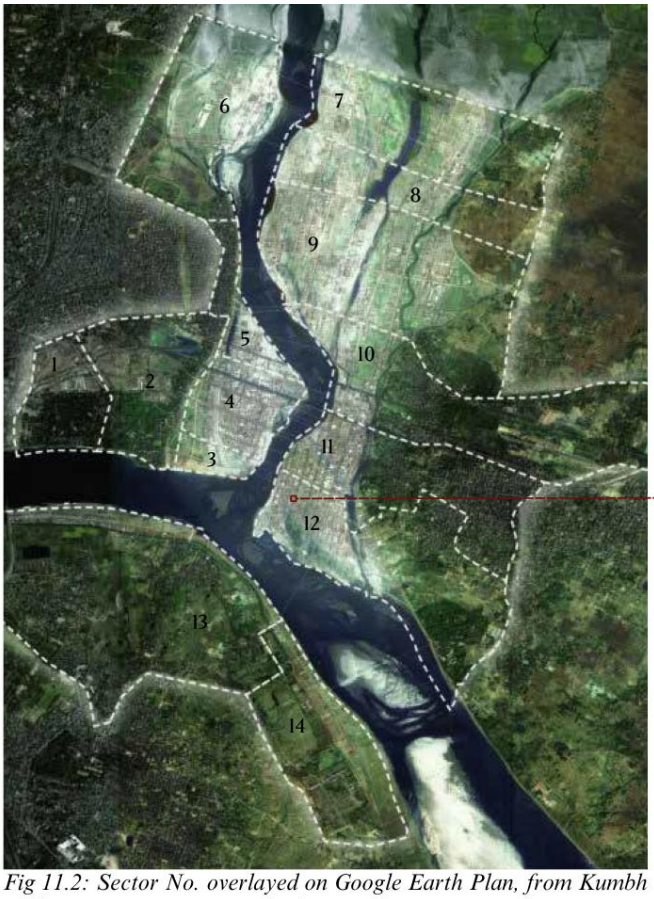


*Fig 11.2: Sector No. overlayed on Google Earth Plan, from Kumbh Mela 2019; Image Source; *A**

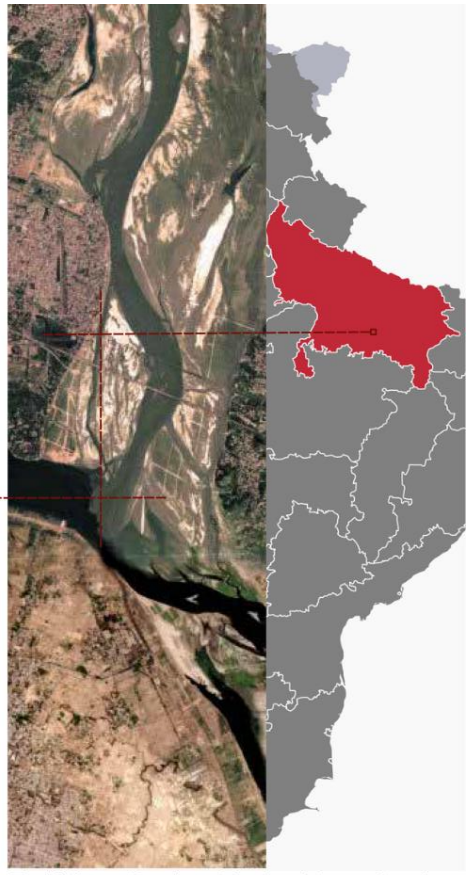


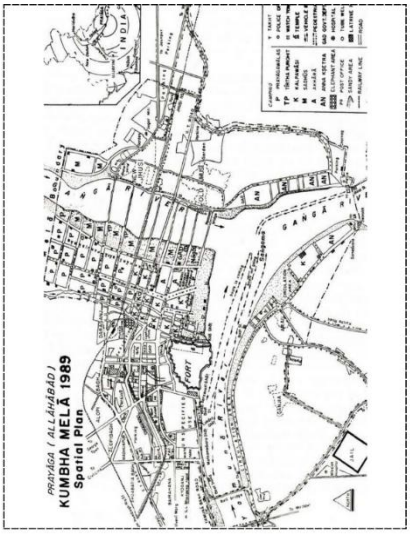
*Fig11.3: Google Earth Zoomed Area, Prayagraj; Image Source; *A**

11.2 SPATIAL STRUCTURE OF KUMBH MELA

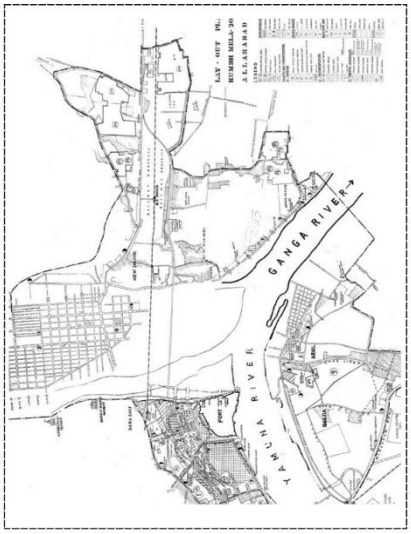
Kumbh Mela is one of the largest religious gatherings in the world, and its spatial structure plays a crucial role in its organization and management. The Kumbh Mela is held every 12 years at four different locations in India: Allahabad (Prayagraj), Haridwar, Nashik, and Ujjain. Each location has its own unique spatial layout, but they all share common features that are designed to accommodate the millions of pilgrims who attend the festival.

The Kumbh Mela is organized around a central area called the "akharas," which are large tents or temporary structures where the various sects of sadhus (Hindu holy men) reside during the festival. The akharas serve as the base camp for the sadhus, and they are also used for religious ceremonies, meditation, and other activities.

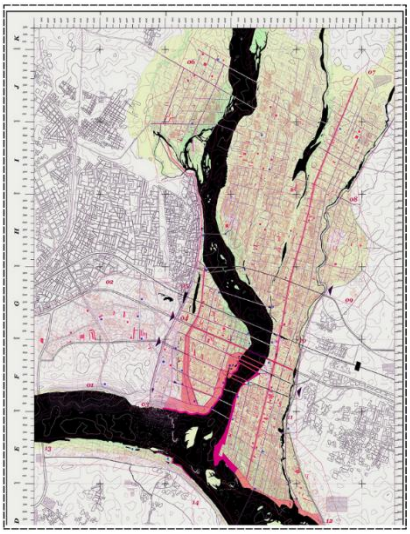
Surrounding the akharas is the "mela area," which is a vast expanse of land that is divided into different sectors. Each sector is assigned to a different group of pilgrims, and it contains temporary campsites, food stalls, and other amenities. The sectors are further divided into blocks and sub-blocks, and each block has its own set of facilities, including toilets, showers, and water points.



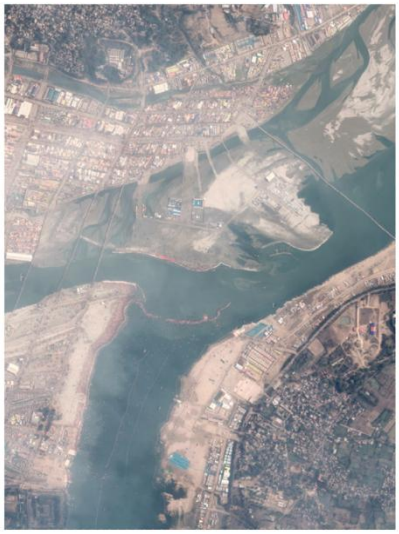
Understanding the spatial structure of the temporal city- Kumbh Mela|1989



Understanding the spatial structure of the temporal city- Kumbh Mela|2001



Understanding the spatial structure of the temporal city- Kumbh Mela|2013



Understanding spatial structure of the temporal city- Kumbh Mela|2019

*Fig 11.4: River Bed & Mela Area. Image Source: *A**

The entire mela area is enclosed by a perimeter wall, and there are several entry and exit points that are manned by security personnel. Inside the mela area, there are designated lanes for pedestrian traffic, and there are also designated areas for vehicles and emergency services. In addition to the mela area, there are also designated areas for parking, medical facilities, and administrative offices. These areas are located on the outskirts of the mela and are connected to the main festival site by shuttle buses and other forms of transport. Overall, the spatial structure of the Kumbh Mela is designed to accommodate the massive influx of pilgrims and provide them with the necessary facilities and services. The organization and management of the festival are complex and require the coordination of multiple government agencies, religious organizations, and local communities.

11.3 GRID FORMULATION & SEQUENCES

The administration creates a grid of numerous blocks that adapts to the topography and arranges the physical space via the interaction between the conjecture about the ultimate shape that the moving ground will take and the preexisting infrastructure layers. The Kumbh Mela's particular position in the Ganga and Yamuna River delta provides the Kumbh's planners with a dynamic hydrological environment. Once the water fades away after the monsoon, the rivers depart behind a shifting riverbed each year. The administrative borders and this changeable backdrop serve as the framework for the settlement's placement.

*Fig 11.5: Grid Sequence . Image Source: *A**

11.4 LAND EXPANSION

The district of Prayagraj witnesses a yearly increase in the number of visitors coming for pilgrimage. Festival authorities have to create a blueprint for the temporary city every year in preparation for the 'Kumbh Mela' festival.

However, due to uncertainty caused by the prolonged time it takes for the river Ganga to recede, planning becomes challenging for the authorities. As the number of pilgrims grows with each festival, more land is required, leading to an increase in the size of the festival grounds from 19.63 sq. km in 2013 to over 25 sq. km in 2019, with an increase in the number of sectors. This, along with the uncertainty of ground availability, adds to the management problems faced by the authorities. Limited time for preparation, as the floodplain ground becomes accessible only after the monsoon season, further complicates the planning process for accommodating a large number of people during the festival. (Dwivedi, Cariappa, 2015).

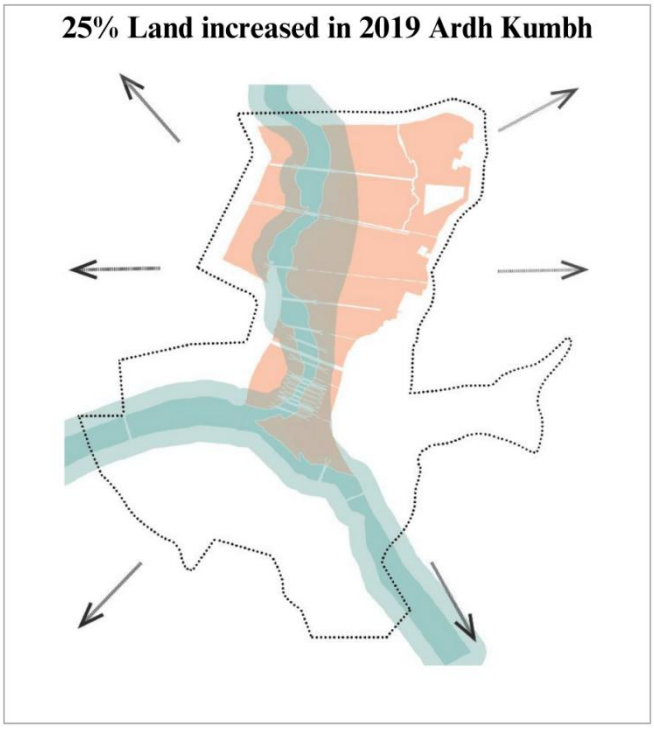
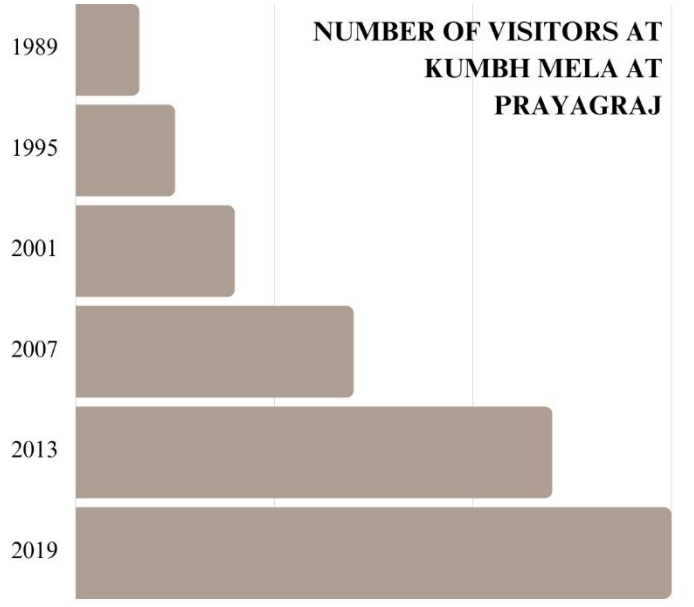


*Fig 11.5: Festival Ground Expansion; Image Source; *C**

11.5 CONTEXT & GRID CHANGES

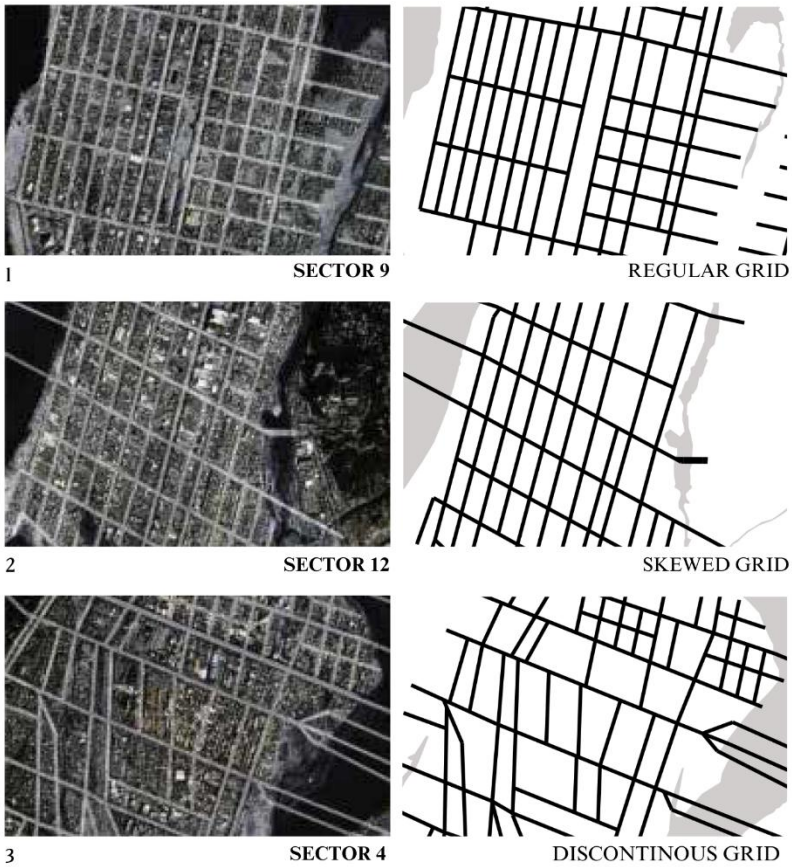
The flowing topography of the always-moving riverbed meets the grid as a neutralizing field. Its flexible grid serves as a mediator between the city's current infrastructure and its shifting shape. It serves as a tool for administration as well as a physical network of infrastructures that provides services to the regions it encompasses.



(Source:- kumbhmelaallahabad.gov.in & www.ijrar.org)

11.6 STREET GRID

Several grids are set up depending on the characteristics of each area; some follow a stricter, neutralizing logic while others aim to modify the landscape. Kumbh's street layout is adaptable enough to the terrain and may be changed to include spaces that are appropriate for the many functions that are called for.



11.7 GRID ANALYSIS

An Examination of Kumbh's urban design The mela displays a wide range of block forms. starting with the blocks' more symmetrical forms in the middle, with the principal Akharas and their blocks with a lot of residential and religious uses getting more and more lopsided and/or cut as The fractal grid contrasts the created and natural worlds boundaries. Block taxonomy demonstrates this. transformation of regular, thick blocks to bizarre irregular kinds. These constituent parts compose the Kumbh's fundamental DNA. Many of these patterns deviate from formal conventions, nonetheless, effectively mesh to produce a tremendously walkable city

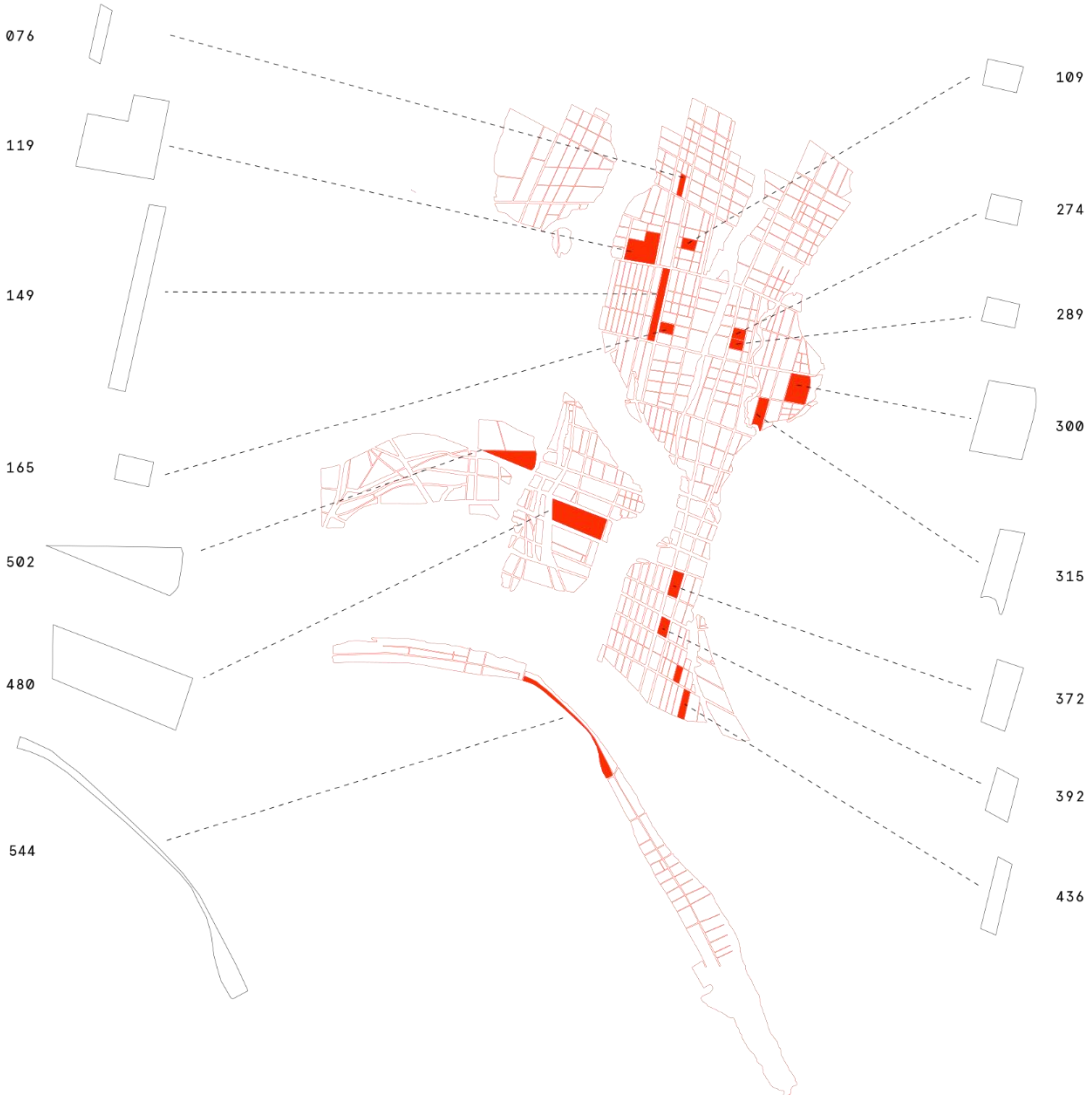


Fig 11.6: Diagram illustrating the occurrence of typology of several plots*; Image adopted as it is from Source: *A**

Fig 11.7: Diagram illustrating the occurrence of typology of several plots*; Image adopted as it is from Source: *A**

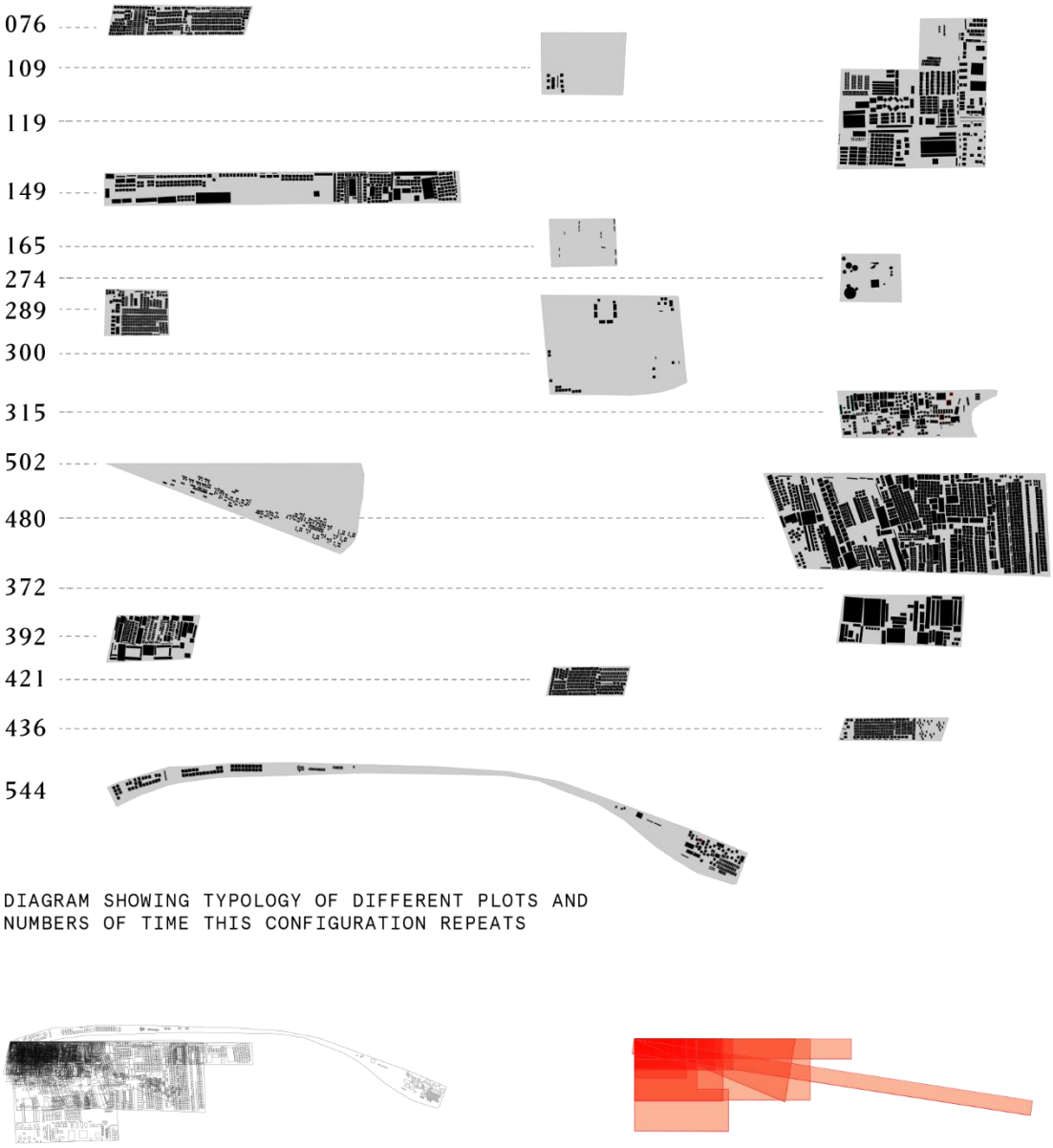


Fig 11.6: Diagram illustrating the typology of several plots and the durations in which this configuration repeats*; Image adopted as it is from Source: *A**

The Akhara

What may be distributed by the Kumbh's governing body is restricted by the Akharas (parcels). The many sects and religious organizations inside the Akharas appropriate the area by erecting tents and other buildings to suit their unique requirements. The Akharas started submitting applications for land in January 2012. Land allocation by the government commenced on November 28, 2012. Although the textures of the numerous Akharas vary greatly, they frequently have the same fundamental structural principles.

The center area is designated with a flag, as shown in the instance of the Juna Akhara. Open, public space surrounds this place of worship. The most alluring, sought-after space with the most visibility is the axis heading to this area. The spatial hierarchy is based on distance from the center holy area.

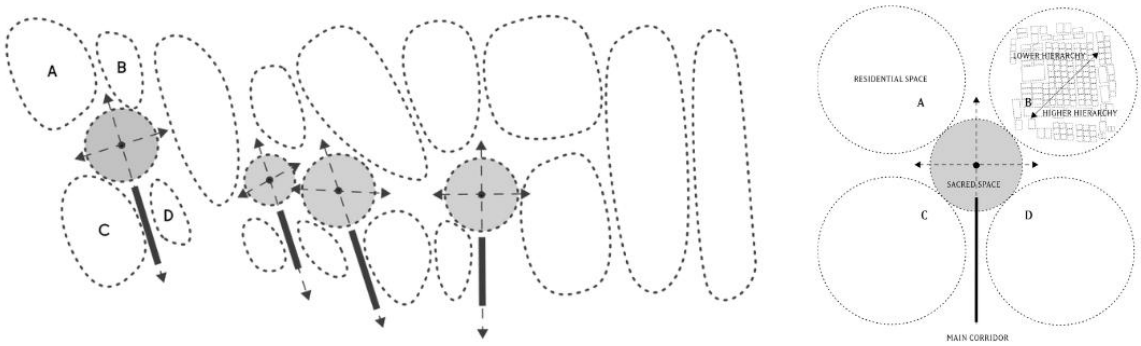


Fig 11.7: Diagram illustrating the structure of Juna Akhara at Kumbh Mela; *Image adopted as it is from Source: *A**

11.8 ROAD SYSTEM

People enter via the bus parking lots and railway terminals (rail is shown in yellow) (and parking is indicated in blue). From the parking lot, pilgrims would walk to the Sangam in buses or their own cars. While the vast majority of pilgrims go by public transportation, some do so in their own automobiles. At the festival's conclusion, there are so many car-bound pilgrims that it causes traffic jams and blockades. The cops are unable to keep up with the surge of personal automobiles. The management has prohibited automobiles from accessing the Kumbh Mela region in order to address these issues. Only police cars and ambulances are allowed on important bathing days.

The road system for Kumbh Mela is an essential aspect of its organization and management. The festival attracts millions of pilgrims and requires a well-planned and efficient transportation network to ensure their safe and timely movement. The roads leading to the festival site are widened and improved to handle the increased traffic flow during the festival period. Temporary roads are also constructed to provide additional access points and to connect different areas of the festival site.

To manage traffic flow and minimize congestion, the road system is divided into designated lanes for pedestrians, vehicles, and emergency services. There are also designated areas for parking, with shuttle buses and other forms of transport providing connections to the main festival site.

The road system is closely monitored by traffic control personnel and security personnel to ensure the safety of the pilgrims and to manage any potential traffic incidents. Ambulances and other emergency services are stationed at various points along the road system to provide prompt medical assistance if needed. Overall, the road system for Kumbh Mela is designed to provide a safe and efficient transportation network for the millions of pilgrims attending the festival, while also ensuring the smooth operation of the festival's organization and

management.

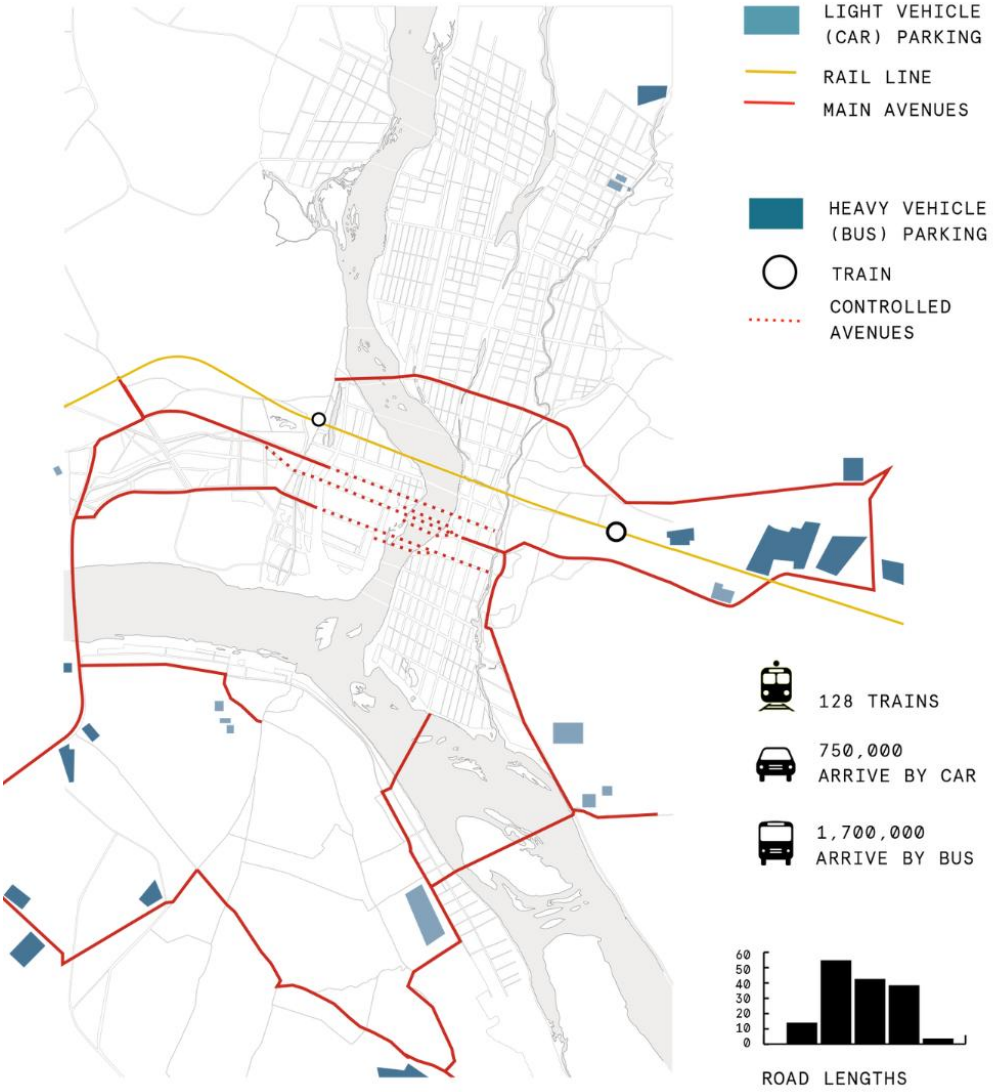


Fig 11.8: Road Networks*; Image adopted as it is from Source: *A**

11.9 ROAD CAPACITIES

Route capacities play a critical role in crowd control since they roughly limit the number of pilgrims that may congregate at a given location at any one moment. These can be thought of as waiting stations for pilgrims traveling to the Sangam. The Kumbh's pathways range in size from narrow 3-meter lanes between tent blocks to pontoon bridges that are 10 meters wide to processional paths that are 50 meters or bigger. Four portals are used to bring the pilgrims into the city. They are connected to the hourly inflow of 200 trains, vehicles, and buses carrying pilgrims.

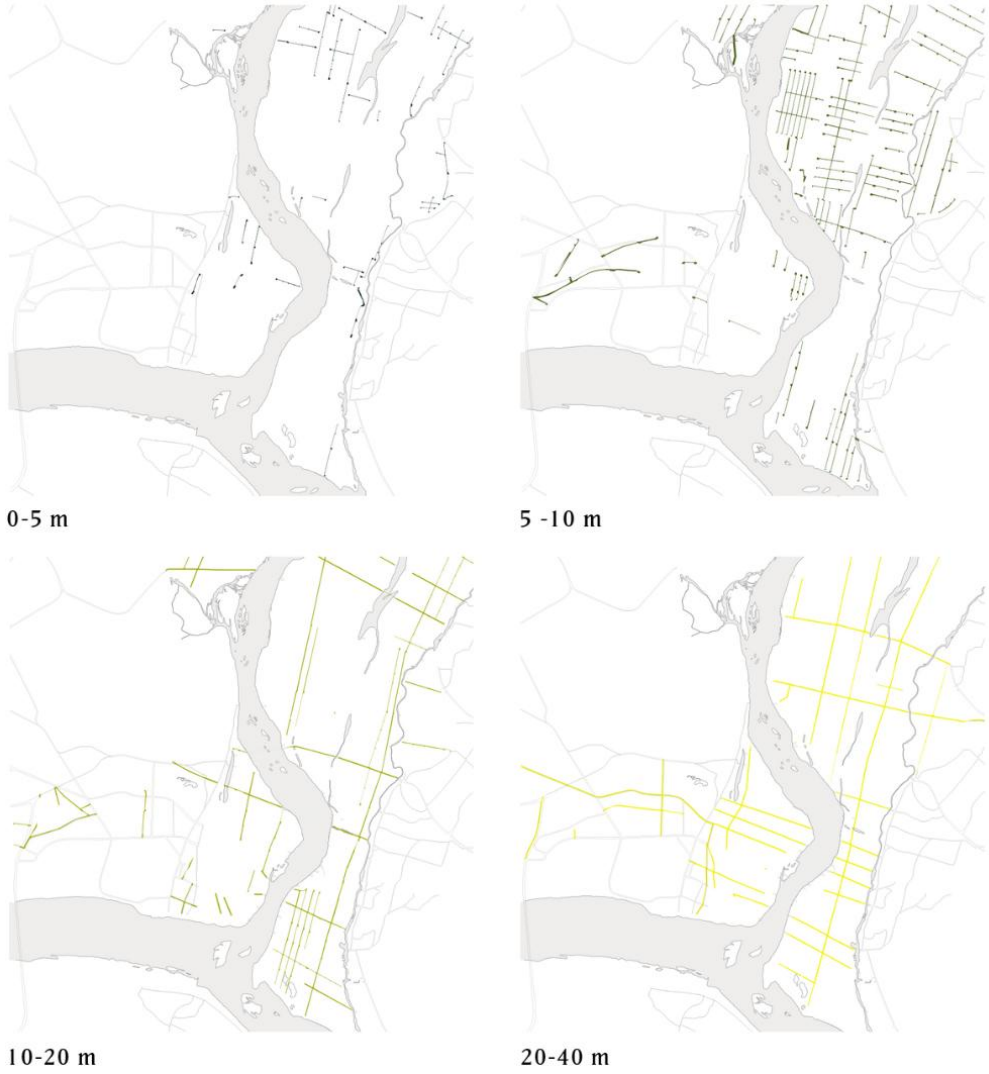


Fig 11.8: Road Capacities*; Image adopted as it is from Source: *A**

11.10 FLOW OF PEOPLE

It's crucial to keep things moving along if the order is to remain. Barricades are erected to ensure both the peaceful commemorations of the Akharas to the Sangam and to reduce congestion by forcing people to take a detour. In order for more people to pass through and for pilgrims to reach the Sangam, strolling and riding police keep the crowds moving.

The police perform a variety of tasks, one of which is to keep watch over a designated region. Each police officer is assigned to a block that they circle every 20 minutes on the Kumbh site, which is separated into grids of 10 to 20 square meters. During the Kumbh, the control grids are tightly packed. According to spatial estimations, there are roughly 30,000+ squares that need police observation, and the Kumbh employs over 30,000 police personnel, assuring security.

Fig 11.9: Flow of people at Sangam*; Image adopted as it is from Source: *A**

11.11 LANDSCAPE FUNCTION

The concept of landscape functions categorizes landscape into four types of functions: cultural, provisioning, habitat, and regulation functions, as shown in a figure. These functions include production, regulatory, social, and recreational functions, as described by Scholz in 2016.

The major meeting place for people during the "Kumbh Mela" festival is the sacred confluence or Sangam, and it is due to its existence that the remaining floodplains serve as the temporary home for the city during the festival.

The confluence of the rivers Ganga and Yamuna, which is one of the most revered and holy spots along the entire length of the river and hosts the festival of "Kumbh mela," makes the surrounding floodplain landscape dynamic in nature. The river Ganga is also regarded as holy elsewhere along its course.

Ecosystem functions	Description	Biophysical Indicators	Goods and service	Users/ determinants
Cultural function	Non material benefits	Ecosystem properties with historic, religious and spiritual values	Religious & spiritual sites recreation education	Pilgrims
Provisioning Production function	Resources, Livelihood from ecosystems	Soil stability and fertility, Air and water quality, Topography, geology	Food Raw materials	Local workers
Habitat function	Maintenance of biodiversity & Evolution processes	Habitat for diversity of species	Refuge for species Nursery function	Nature
Regulation function	Benefits from ecosystem processes	Properties of land cover	Maintenance of soil fertility flood prevention erosion prevention	Authorities

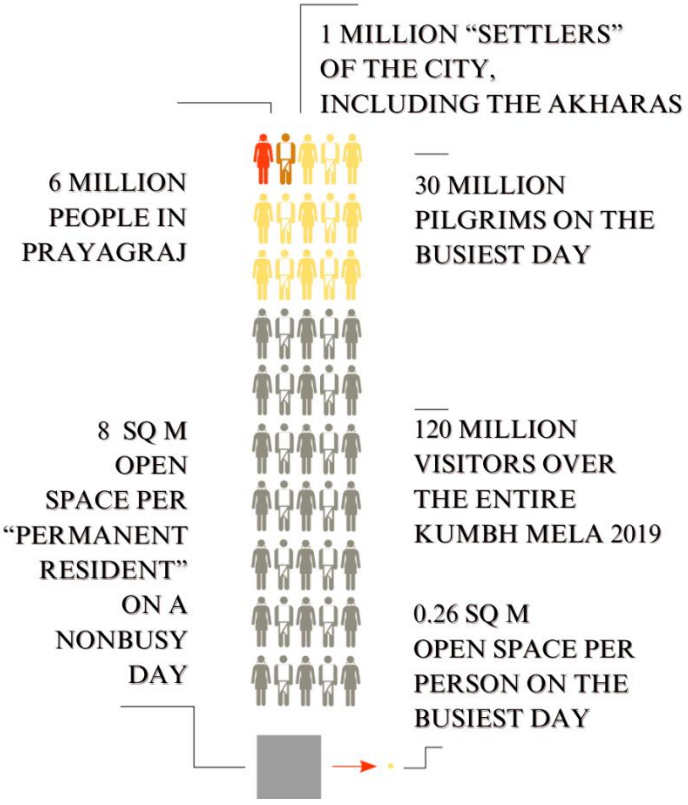


*Fig 11.10: People visiting Sangam on Snan Days; Image adopted as it is from Source: *A**

11.12 PURIFYING SPACES & MAIN PROCESSION ROUTE

The sacred meeting place of the Ganges, Yamuna, and Saraswati rivers is known as the Sangam. Masses of pilgrims are lured to the location during the Kumbh to bathe in the sacred river. The map depicts the common yearning for both holy men who also are frequent visitors and newcomers from a great distance to travel near the holy confluence.

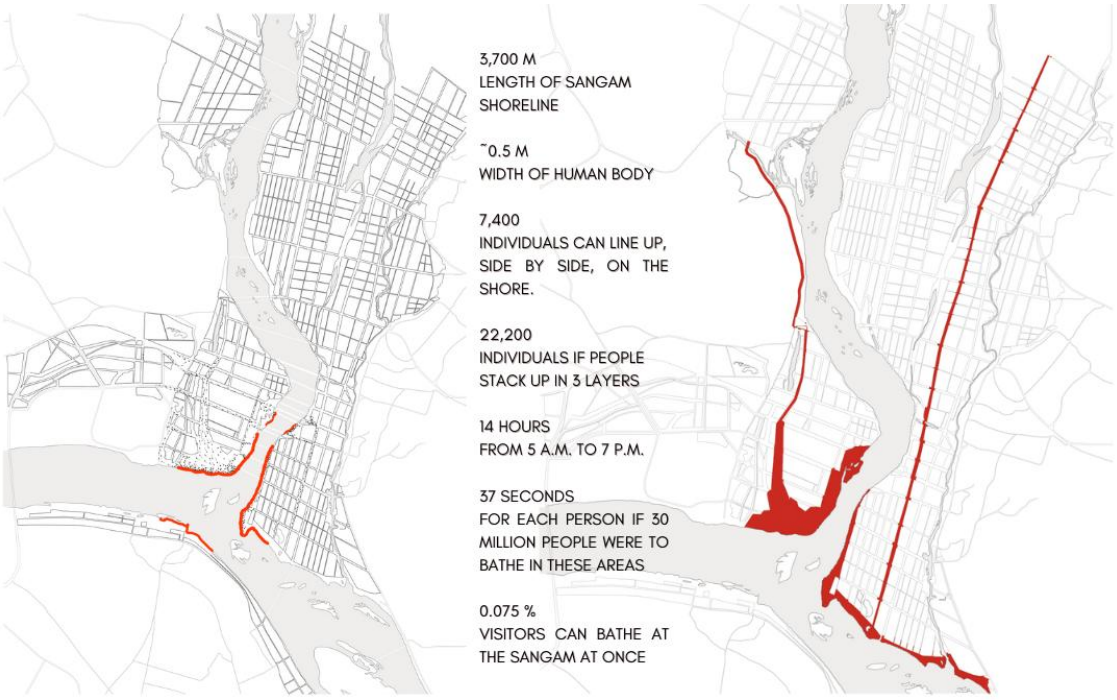


*Fig 11.11: Purifying Spaces & Main Procession Route; Image adopted as it is from Source: *A**

The march to the Sangam, or sacred confluence, is led by the Akharas. The Akharas march to the river beach starting at approximately six in the morning in a set order depending on significance and seniority. They move along two principal procession routes that are blocked up over their whole duration. The procession path towards the west is more well-liked since it covers a greater region and has senior Akharas lining its flanks.

11.13 MAIN FLOW & POTENTIAL OVERFLOW ROUTES

The barricades at certain checkpoints sometimes open to let pilgrims join the procession or take a different path to the Sangam. The challenge of managing crowds is enormous, and a rush of people poses a serious risk. The police attempt to direct people to different ghats along the beach as part of their approach.

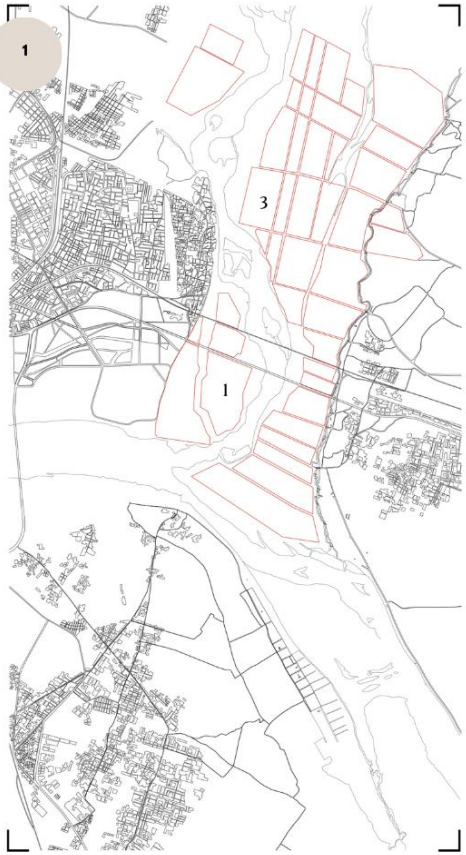
The Akharas march along this path to the seashore on bathing days. Although the majority of pilgrims prefer to bathe on this side of the Sangam, they are sometimes urged or diverted to wash at ghats further to the north, over on the east bank, or in the

new sectors 13 and 14 to the south for crowd-control purposes. Less prestigious Akharas and other groups with fewer connections to the Kumbh organizers are located along the procession path to the east. In order to accommodate the growing number of pilgrims visiting the Sangam, the processional pathways are made wider.

The Akharas march to the Sangam along the principal procession routes that have been arranged for the bathing days. While their sequence of washing has been fixed, there is great rivalry amongst the sects. The first group departs at approximately 5 a.m., and the final group returns at about 4 p.m. Before the following group physically charges to the river, each party is provided with an hour within about at the Sangam. To keep the multitudes of pilgrims under control, the main procession paths are closed along their sides. They take a dip in the water along the coast, but not in the most fortunate locations. The daily flood of transient travelers is brought in by these key highways. These pilgrims arrive during the religious holidays, take a bath, and then depart. This pattern is followed by most pilgrims. The main thoroughfares are clogged with traffic on this crucial day, putting them in danger of congestion. On this day, more than 10 million people attend.

*Fig 11.11: Main Access Route; Image adopted as it is from Source: *A**

*Image adopted as it is from Source: *A**

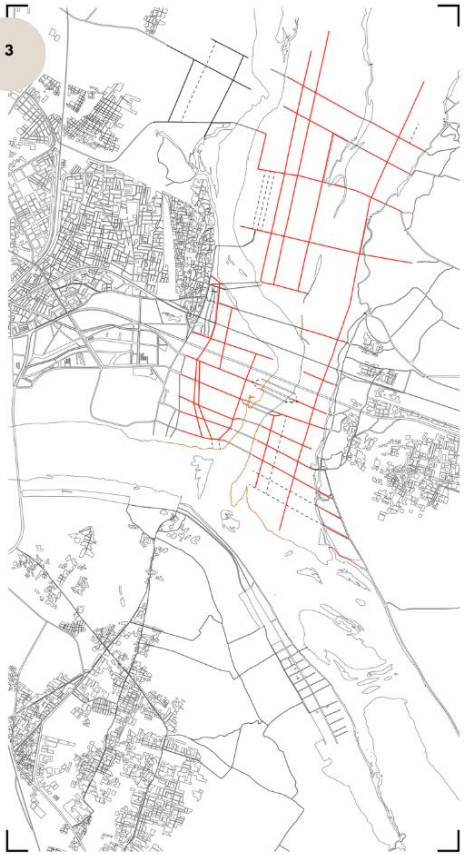


Map 1
March-May

- Agricultural land covers most of the area, interconnected by informal dirt roads
- A Map of the area in its current state is sent to the army
- Major road axis designated and secured to begin material transport
- The chief secretary meets with the administration on-site to assess conditions and future

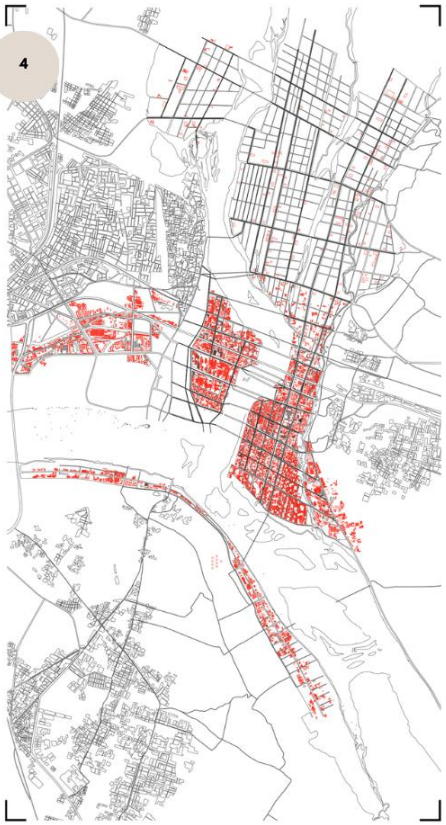
Map 2
October-November

- River recedes and leaves dampened land
- Major roads were demarcated and bulldozed in preparation for metal sheets
- Sector boundaries outlined electric poles deployed in southern sectors
- Initial pontoon deployment for secondary bridges



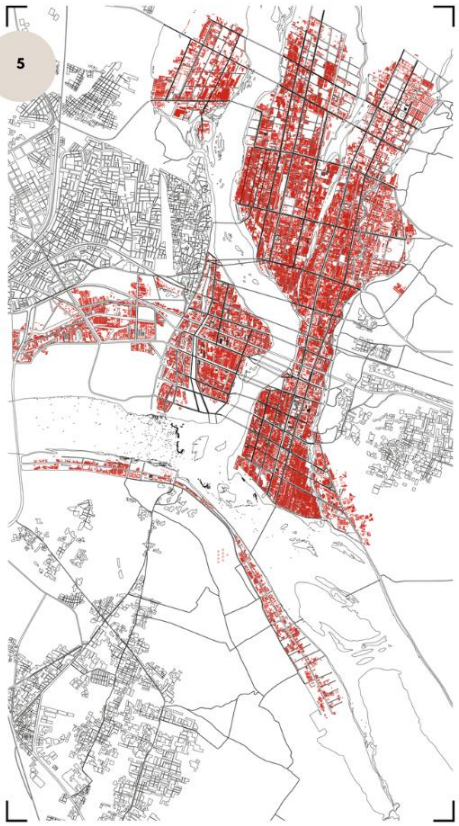
Map 3
December

- All major roads completed
- Secondary roads traced
- Pontoon deployment and bridge construction 75% complete
- River embankments 25% complete
- Infrastructure deployment for water, electricity, and telecommunications
- Tent construction and occupation commences



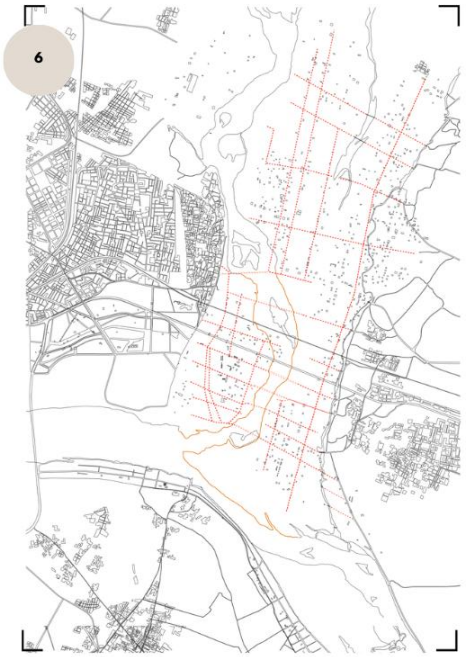
Map 4
January

- All road production completed
- Construction south of the Sangam begins
- River embankments 90% complete
- All bridge construction completed



Map 5
February

- Kumbh Mela 100% ground occupation



Map 6
March-April

- Tent disassembly and subsequent infrastructure removal
- Sorting and collection of material components
- Straw mats along the embankments burned
- Sandbags appropriated by city residents
- Bridge and pontoon deconstruction
- Agricultural activity resumes
- Sangam activity wanes to smaller bathing groups

*Image adopted as it is from Source: *A*

11.14 DEPLOYMENT AND ASSEMBLY

The Kumbh Mela's deployment and assembly follow the yearly cycles dictated by the monsoon season. The phases of deployment and construction start to take shape after the conclusion of the rainy season when the fertile land is no longer being utilized for agriculture: the ground is leveled, the roads are designated, and infrastructure like electricity poles, water supply, and pontoon bridges are installed. A network of enclosures is added when these buildings are constructed. All of these things are disassembled when the event is over, leaving nothing behind on the location.

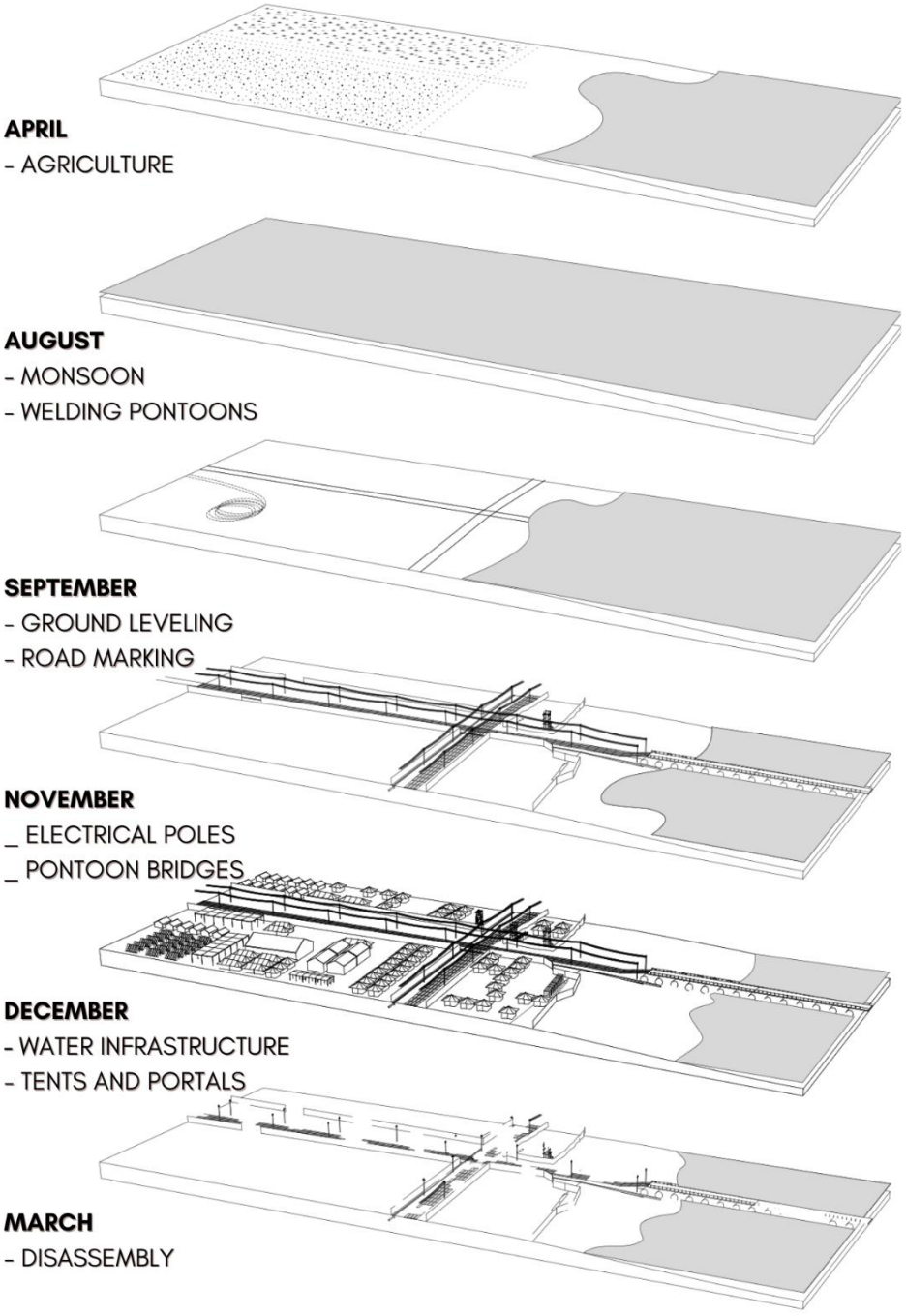


*Image adopted as it is from Source: *A**

11.15 DEPLOYMENT AND DECONSTRUCTION

One must do a chronological and physical system analysis of the Kumbh Mela in order to comprehend its effects on the spatial-environmental system.

The Kumbh Mela's gathering is tied to the seasonal and river cycles that occur naturally, to the cycles of the other melas, and to regional and sometimes even national cycles of contraction and expansion.

The Kumbh Mela's construction technologies are well-matched to these temporal and geographical scales. The river delta supports agricultural life between festivals and is transformed into a crowded, grid-style metropolis during the festival. Each year, the monsoon floods the area, turning it back into a riverbed. Spatial zoning, electrical supply, healthcare facilities, food and water distribution, sanitary services, trade, and political administration are all made possible by physical infrastructures.

The design and development of temporary camps, quick infrastructure deployment, and modern urbanism in general, inasmuch as it aspires to integrate the global metabolism in strong and meaningful ways, may all benefit from the lessons acquired during the Kumbh Mela.

11.16 INFRASTRUCTURAL SYSTEMS

Simple biological systems to more complicated aggregations of various elements make up the infrastructure. The systems are built from generic components that may be recycled or reused whenever feasible to prolong their useful lives and reduce waste.

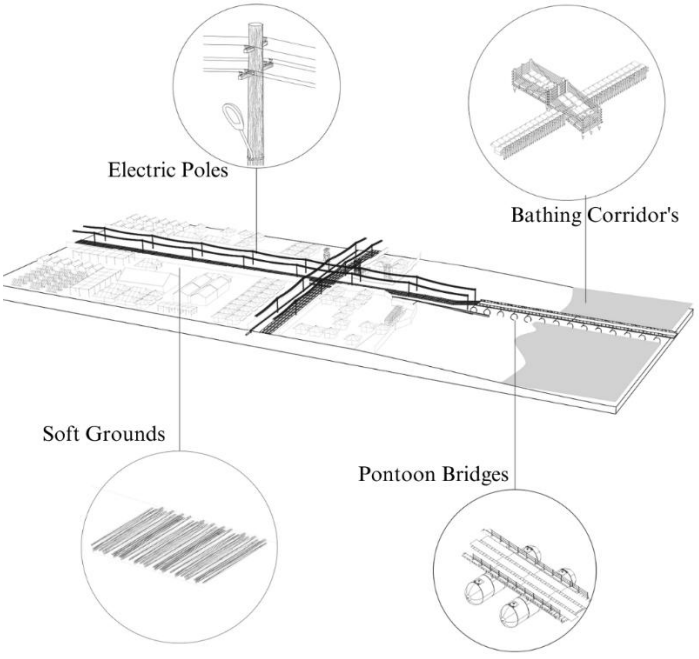


*Image adopted as it is from Source: *A**

11.17 SANITATION INFRASTRUCTURE

Sanitation is a crucial component of the infrastructure required to securely manage the population. At the Kumbh, there are more restrooms than ever before, some of which are novel. The sanitary infrastructure has been heavily enforced, with battalions of sweepers cleaning the sites at a minimum of twice per day. They maintain the enormous sewage pits and clean up the different lanes that end up being places for open defecation, spraying them with sanitizer and DDT to keep insects at bay.

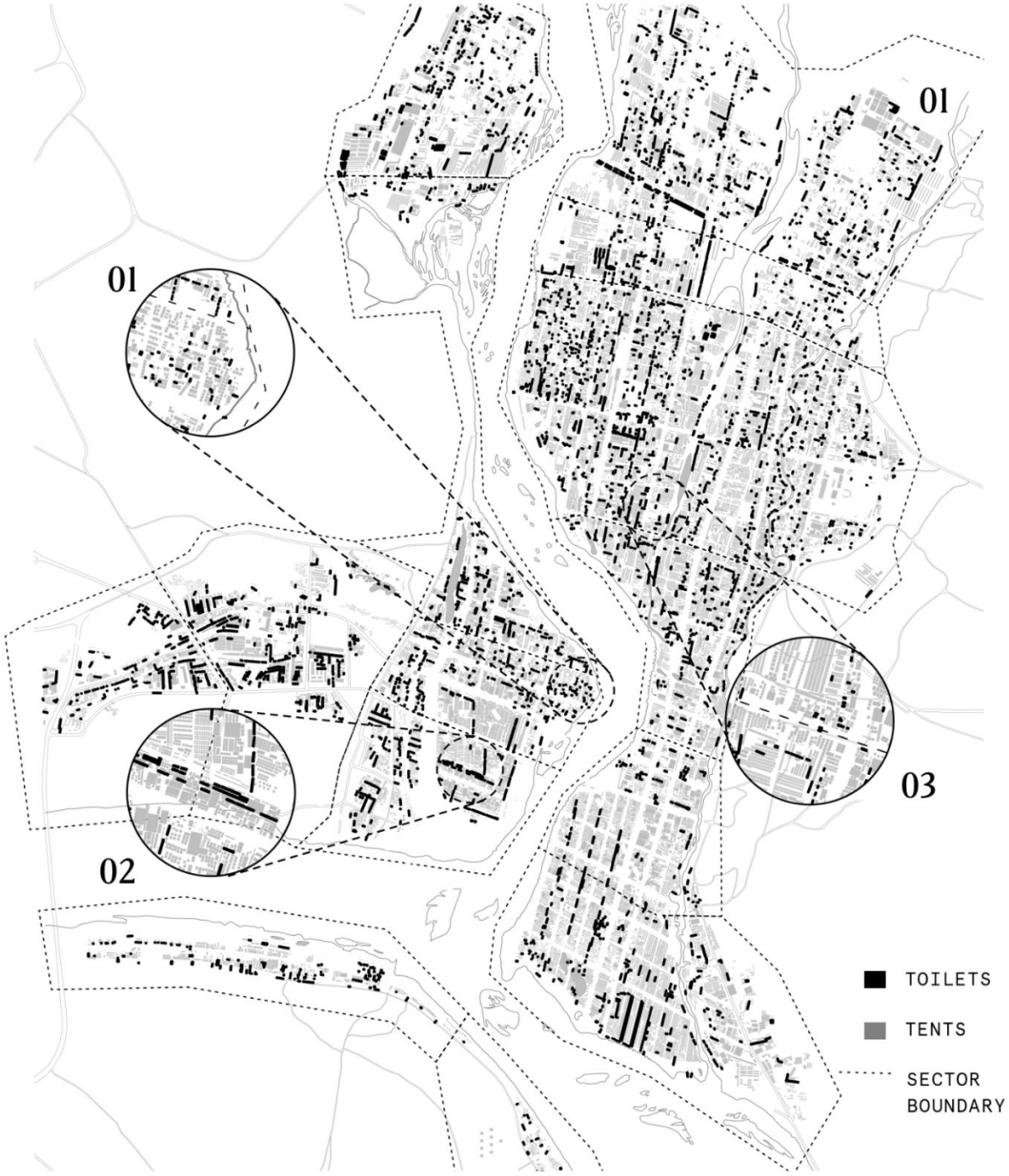


*Image adopted as it is from Source: *A**

11.18 ENCLOSURE SYSTEMS

The Kumbh Mela's enclosure systems are built using straightforward generic components. Bamboo twigs and a buffer layer like corrugated metal or tent fabric (highly inflammable) are the same fundamental components that may be used to create a variety of buildings, from tiny tents to enormous gathering halls and temples. The adaptable enclosure systems are made up of comparable fundamental components that may be combined to create a wide variety of quasi-urban typologies. These construction systems' simplicity makes them suitable for simple deployment and logistics. One or two employees can transport and assemble the components since they are compact and lightweight, similar things to the planned re-proposal.

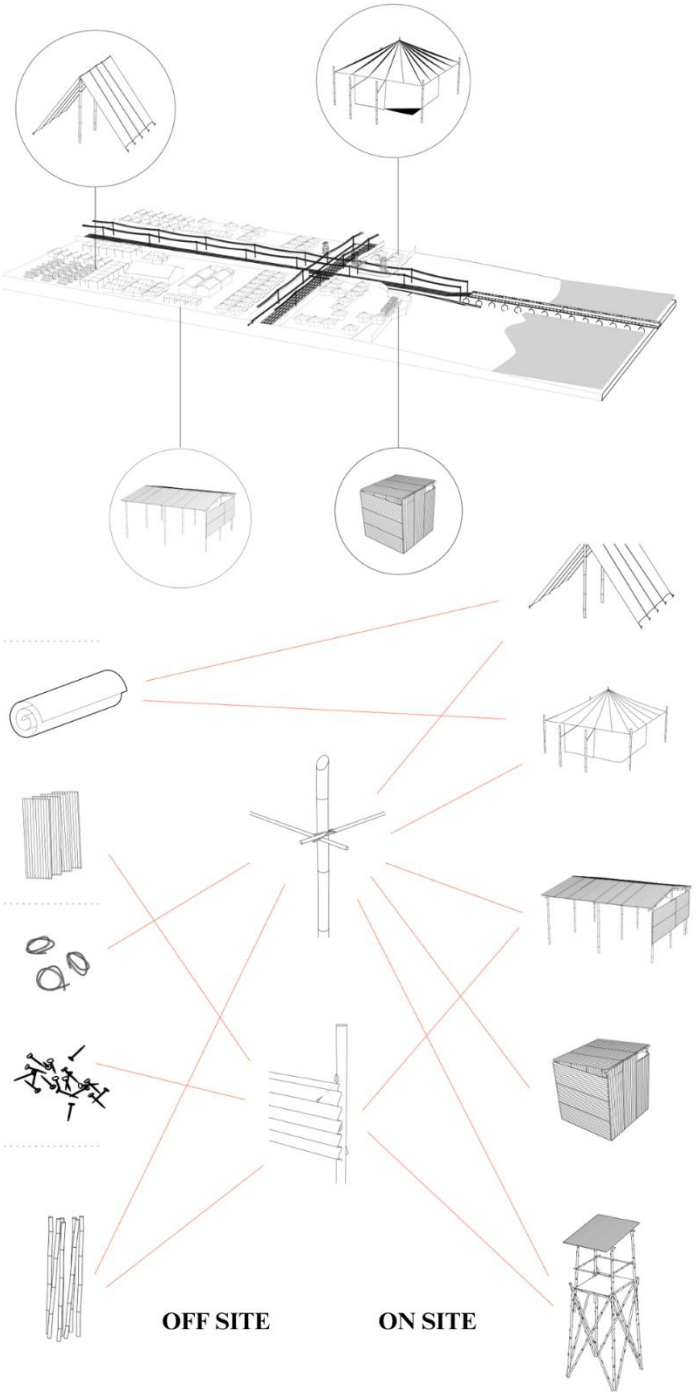


*Image adopted as it is from Source: *A**

11.19 MODULAR ROAD SYSTEM

The Kumbh Mela's roadways serve as the foundation of the city's grid, forming the framework for its brief existence. They serve as an intriguing illustration of the concept of material system calibration for the job at hand. The roadways are either built of steel plates or are only laid out with reed, depending on the sort of traffic.

The metal plates are universal components that may be utilized in many configurations. They are spread out in the proper alignment, then linked with detachable bolts after being punctured with a blowtorch. This eliminates the need for specialized connections or plates and enables optimum flexibility to different radii and slopes.

Trucks are used to transfer the plates, and a team of ten employees carries each one into position. The reed roadways are organic renewable infrastructures that are renewed as needed throughout the Kumbh Mela.

11.20 PERMANENT & TEMPROARY INFRASTRUCTURES

The Kumbh Mela's temporary infrastructure depends on the province of Uttar Pradesh and the city of Allahabad's current network infrastructure. The electrical grid, as well as the road and rail network, are examples of these permanent infrastructures. This plug-in strategy depends on a brief redistribution of energy and transportation flows within the Uttar Pradesh state. The temporary infrastructure is set up at the same time as the road network. Whereas the water systems are buried below, electricity cables are routed above ground along movable utility poles. These transient infrastructures are built and destroyed in a couple of weeks without leaving any traces.

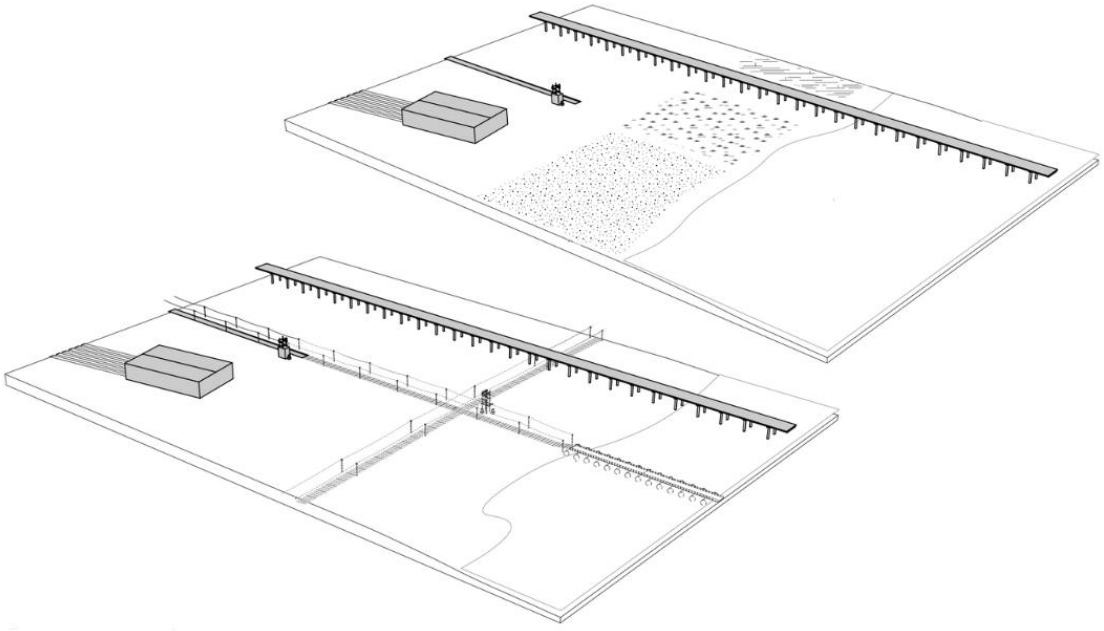


*Image adopted as it is from Source: *A**

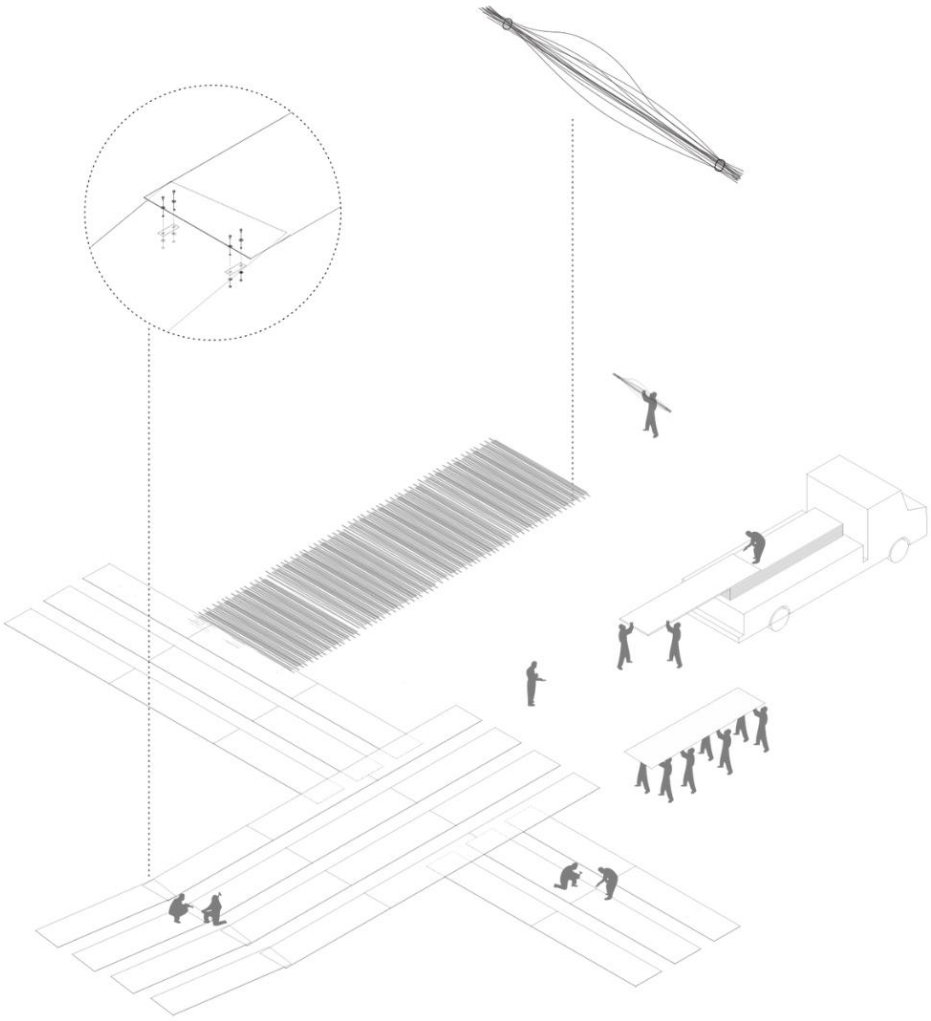


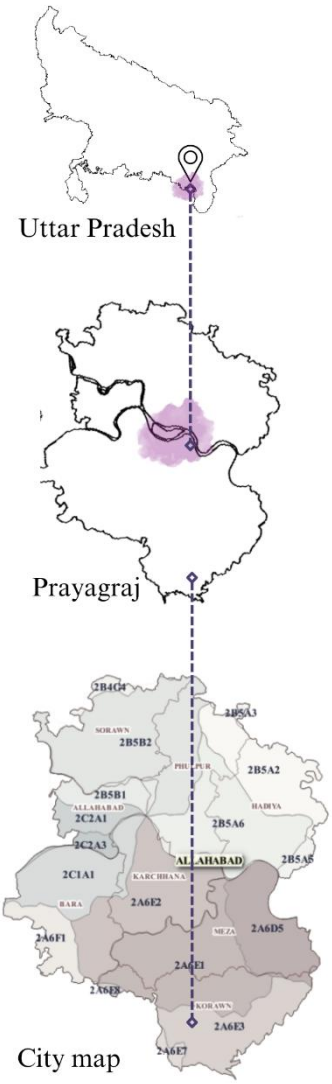
*Image adopted as it is from Source: *A**

CHAPTER 12: SITE STUDY AND ANALYSIS

*NOTE: This study was done with the help of a book written by Rahul Mehrotra & Felipe Vera and Image; *A*, adapted as it is from the book for study purposes, the book is titled:" Kumbh Mela | Mapping the Ephemeral Megacity" and Images *B* & *C*; are adapted as it is from a study conducted by students of TU Delft.*

12.1THE SANGAM CITY; PRAYAGRAJ

Prayagraj is crowned in ancient scriptures as 'Teertharaj' and is considered one of the holiest pilgrimage centers of India. It is believed to be one of the holiest spots in the country. is situated at the confluence of Triveni Sangam of sacred rivers Ganga, Yamuna, and the mystical Saraswati.



Formerly Allahabad, is a South-Eastern city in Uttar Pradesh, northern India. Situated at the confluence of the Ganga and Yamuna rivers, with 11 lakhs population settled around.
The present city of Prayagraj was founded in 1583 by the Mughal emperor Akbar, it has been primarily an administrative and educational center. It has a modest industrial base and is a marketplace for agricultural products. It has religious importance to Hindus persists, calls it "City of GOD"

The Kumbh is held in four sacred places in India and Prayagraj is one of them. A city of many dimensions is what befits the description of Prayagraj. In addition to being a major pilgrimage center, the city has played an essential part in the formation of modern India. Hindu mythology states that Lord Brahma, the creator, chose this land for the 'Prakrishta Yajna'.

During the Kumbh Mela, Prayagraj becomes the site of a massive pilgrimage, with millions of people descending on the city to take part in the festivities. The festival's spatial structure, road system, and other infrastructure are designed to accommodate the massive influx of pilgrims and ensure their safety and comfort.

Overall, Prayagraj is an important cultural and religious center in India, and its role as a host of the Kumbh Mela makes it a significant destination for millions of pilgrims from around the world.

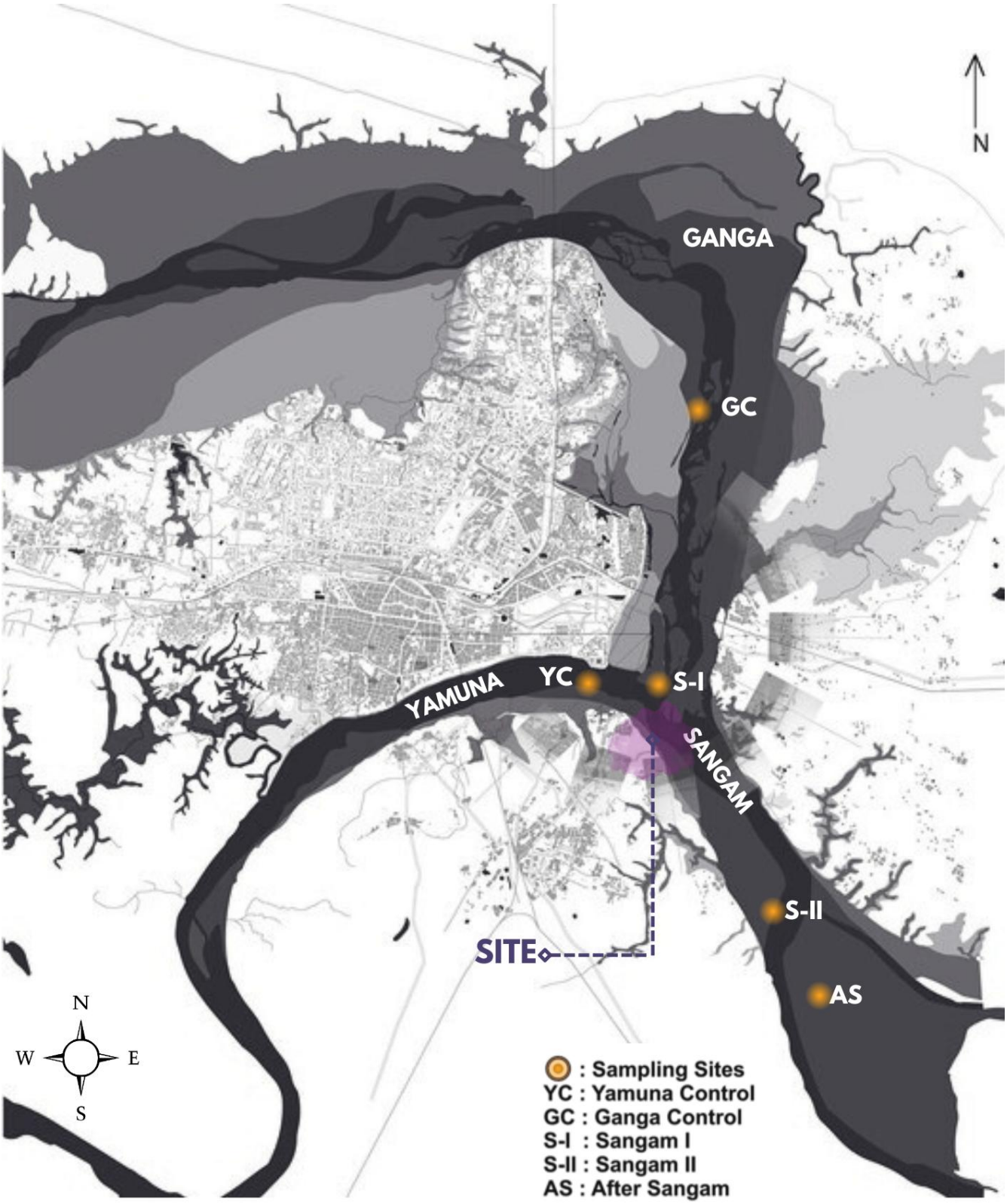


*Fig 12.1: River & Prayagraj; Image adopted as it is from Source: *C**

12.2 THE RIVER & SEASONS

Prayagraj, which is situated in the northern Indian state of Uttar Pradesh, experiences three main seasons: summer, monsoon, and winter.

Summer in Prayagraj lasts from March to June, and temperatures can soar up to 45°C (113°F) during the day. It is not an ideal time to visit the city due to the intense heat and dry weather.

Monsoon season in Prayagraj begins in July and lasts until September. The city receives heavy rainfall during this time, and the weather can be humid and uncomfortable. The monsoon season can also cause the Ganga River, which flows through Prayagraj, to swell and flood its banks, causing disruptions to the city's infrastructure.

Winter in Prayagraj begins in November and lasts until February, with temperatures dropping as low as 5°C (41°F) at night. The weather is pleasant during this time, and it is considered the best time to visit the city.

The Ganga River, which is considered sacred by Hindus, has a significant impact on the seasons in Prayagraj. The river is fed by glaciers in the Himalayas and flows through several states in India, including Uttarakhand, Uttar Pradesh, Bihar, and West Bengal.

During the monsoon season, the Ganga River receives a significant amount of water, causing it to swell and flood its banks in some areas. This can cause disruptions to transportation and infrastructure in cities like Prayagraj.

In the winter, the water levels in the Ganga River tend to be lower, making it easier for pilgrims to take a dip in the river as part of their religious practices. Overall, the seasons in Prayagraj and the Ganga River context play a crucial role in the city's cultural and religious life and are an important consideration for visitors to the region.

In addition to the impact on the seasons, the Ganga River is also a vital resource for the people of Prayagraj and the surrounding areas. The river provides water for irrigation, drinking, and industrial use, and it supports a diverse ecosystem of flora and fauna. However, the river is facing several challenges, including pollution, over-extraction of water, and habitat destruction. The government and various organizations are working to address these issues and restore the health of the river. The cultural and ecological significance of the Ganga River makes it an important part of life in Prayagraj, and efforts to protect and preserve the river are crucial for the well-being of the city and its people.

*Fig: Dynamic cycle of the floodplain landscape, Image Source: *C**

*Fig 12.2: Seasons & River; Image adopted as it is from Source: *C**

12.3 PHYSICAL LANDSCAPE

Here I have tried to understand, how to interpret the river Ganga's changing floodplain landscape in Prayagraj in relation to its physical landscape. The analysis and conclusion follow an examination of the processes (dynamic cycle, movement of the river flow), spatial arrangement, and topography of the terrain.

The climate of the region is an overlap between humid subtropical and semi-arid. The region experiences conditions of cyclic droughts and flooding due to this extreme climate condition.

ANNUAL TEMPERATURE: **25.7 Deg C**
AVERAGE ANNUAL RAINFALL: **981 MM**

Zones with a very high risk of flooding are located around the Ganga and Yamuna rivers. Less than 88 meters is the average height of these zones. The heavy flooding areas correspond to the previous river route. The figure on the right illustrates moderate zones as moderately swampy and salty terrain. (Chaturvedi, Mishra, 2015)

Low to moderate flooding (occurs annually, water levels exceed normal river level), severe flooding (occurs every 5–10 years, water level slightly below highest flood level), and extreme flooding (occurs every 10–15 years, water level equal to or above HFL – highest flood level), all occur in India's very high flood susceptible zones.

Because they can't adjust to functions that are changing all the time, each of these phases has a number of difficulties. These difficulties put at danger the landscape's dynamic character, which helps to define the site's identity or genius loci. The difficulties that this river Ganga's changing floodplain terrain encounters are shown in Fig. 12.2.

The physical landscape of the Ganga River is diverse and includes steep valleys, plateaus, and fertile plains. In the upper reaches of the river, the landscape is characterized by rugged mountains and steep gorges, while the middle and lower regions are dominated by the vast Indo-Gangetic plains.

The Ganga River basin is home to several important ecosystems, including wetlands, forests, and grasslands. These ecosystems support a rich diversity of flora and fauna, including endangered species such as the Ganges River Dolphin, the Gharial crocodile, and the Indian Skimmer bird.

The river is also a crucial resource for millions of people who live along its banks, providing water for irrigation, drinking, and industrial use. However, the river is facing several challenges, including pollution, over-extraction of water, and habitat destruction. These issues have a significant impact on the health of the river and the people and wildlife that depend on it.

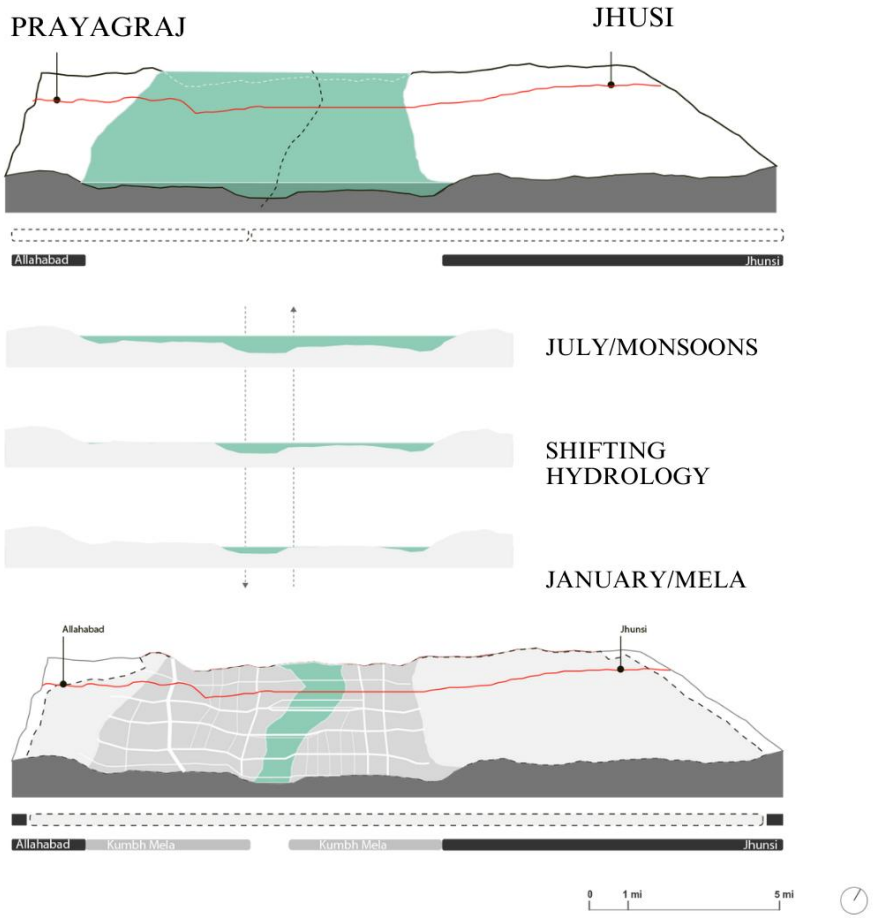
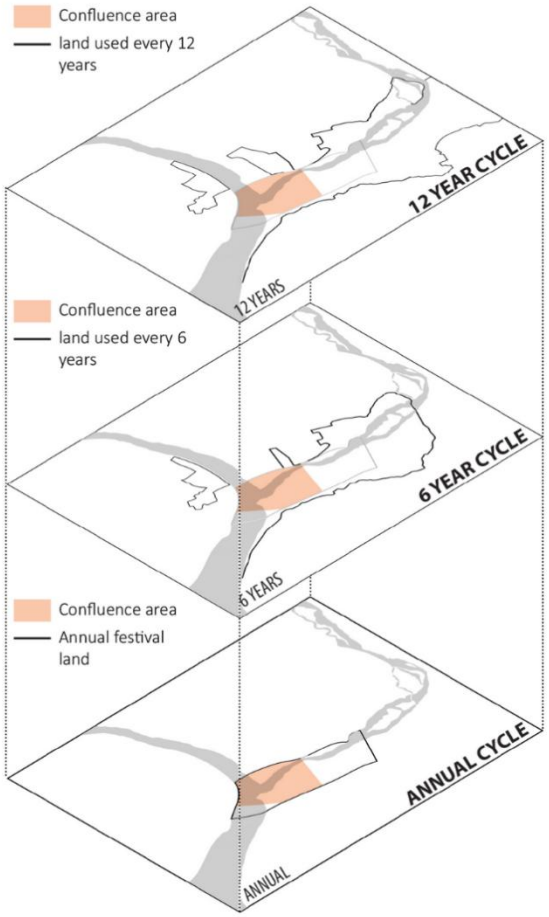
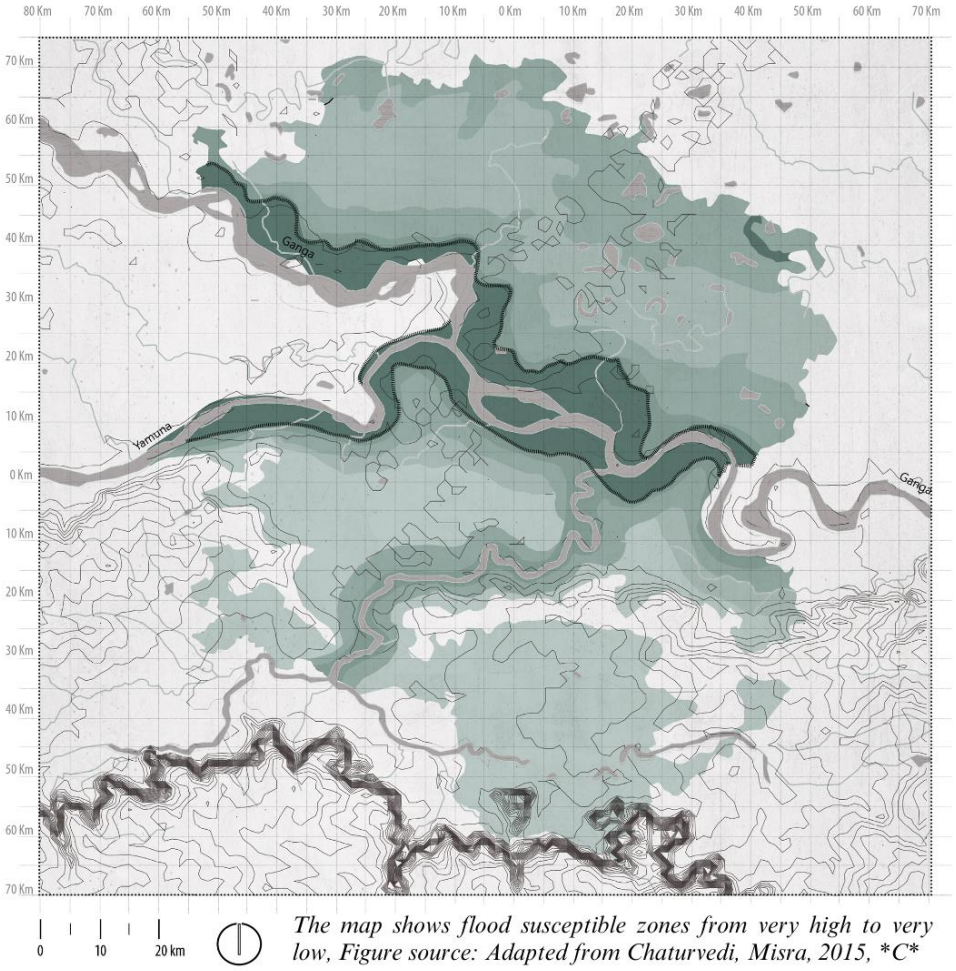


*Fig 12.2: River & Landscape; Images adopted as it is from Source: *B**

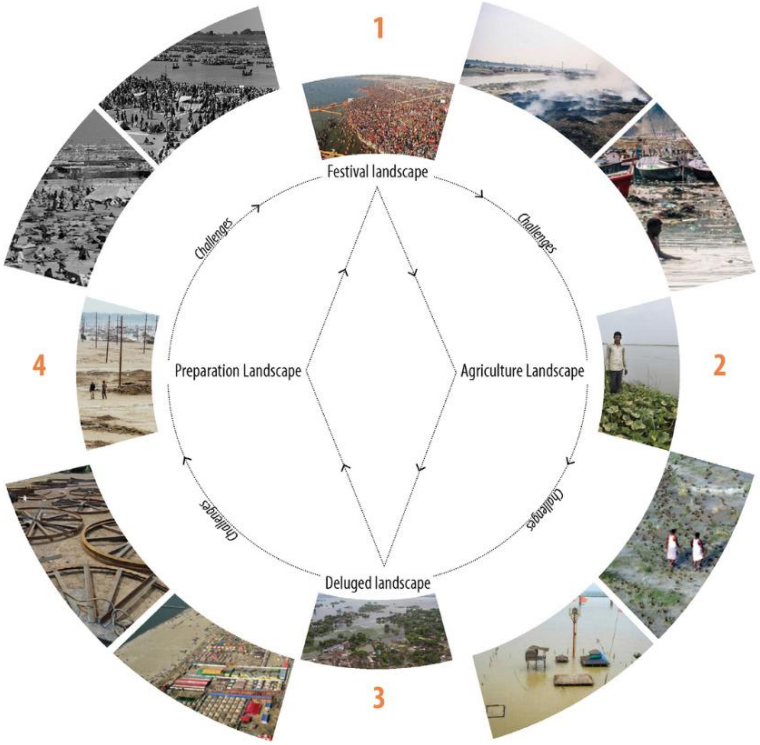




*The map shows flood susceptible zones from very high to very low, Figure source: Adapted from Chaturvedi, Misra, 2015, *C**

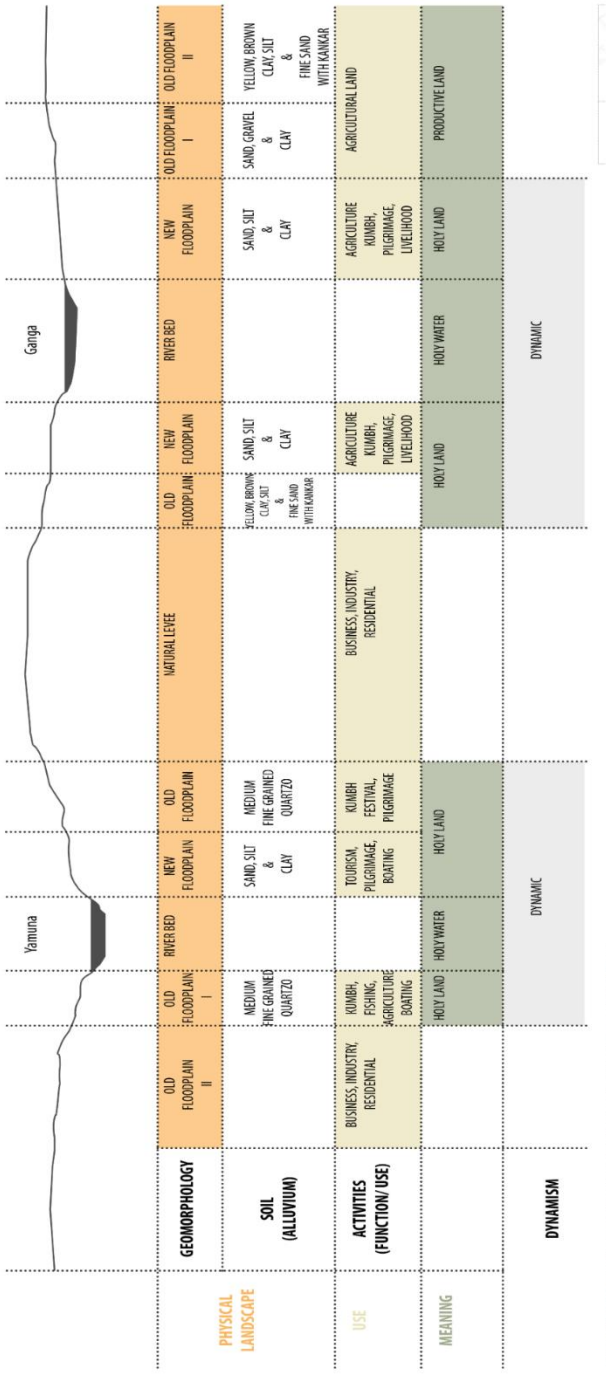
Very High flood susceptibility
High flood susceptibility
Moderate flood susceptibility
Low flood susceptibility
Very low flood susceptibility
Flood free zone

Figure below illustrates the difficulties faced by Prayagraj's Ganga floodplains as they change from one phase to the next.



12.4 FLOOD PLAIN TOPOGRAPHY

The figure depicts a typical stretch of the Yamuna and Ganga rivers before they converge at the Triveni Sangam, known as the holy confluence. The geomorphology, soil properties, and function of the floodplains and surrounding lands are highlighted, and categorized into the physical setting, usage, and meaning of the landscape according to the tripartite approach. The rivers and floodplains are described as a dynamic environment that is constantly changing. The permanent landscape of the region includes areas with permanent settlements located under the natural levee and land used for agriculture, as shown in the figure.



12.5 SHIFTING OF THE RIVER PLAIN

The figure depicts a typical stretch of the Yamuna and Ganga rivers before they converge at the Triveni Sangam, known as the holy confluence. The geomorphology, soil properties, and function of the floodplains and surrounding lands are highlighted, and categorized into the physical setting, usage, and meaning of the landscape according to the tripartite approach. The rivers and floodplains are described as a dynamic environment that is constantly changing. The permanent landscape of the region includes areas with permanent settlements located under the natural levee and land used for agriculture, as shown in the figure. Over time, the Ganga River has seen migration in some areas and channel avulsion during yearly floods, as depicted in the figure.

The Ganga River has moved about 2.9 km westward from Faizullahpur to the south of Rangpura, according to a comparison of the Ganga River channel configuration between 1973 and the present. Additionally, the river has witnessed a strong southerly movement throughout its 3 km course from 1973 to the present. (Uniyal, Shah, Rao, 2018). During the rainy season, the former Ganga River route could act as a path for excessive floodwater.

The West side of the river, which is the more popular pilgrimage destination during the Kumbh festival due to its proximity to the confluence as well as access to the city of Prayagraj, is also at risk due to the Ganga channel's oscillatory migration, which makes its future path quite unpredictable. (Uniyal, Shah, Rao, 2018).

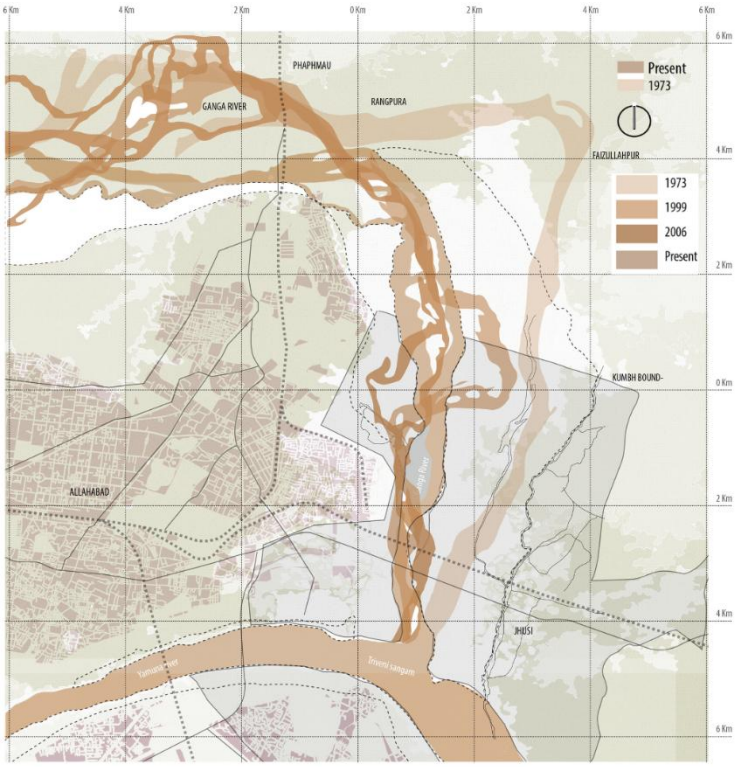


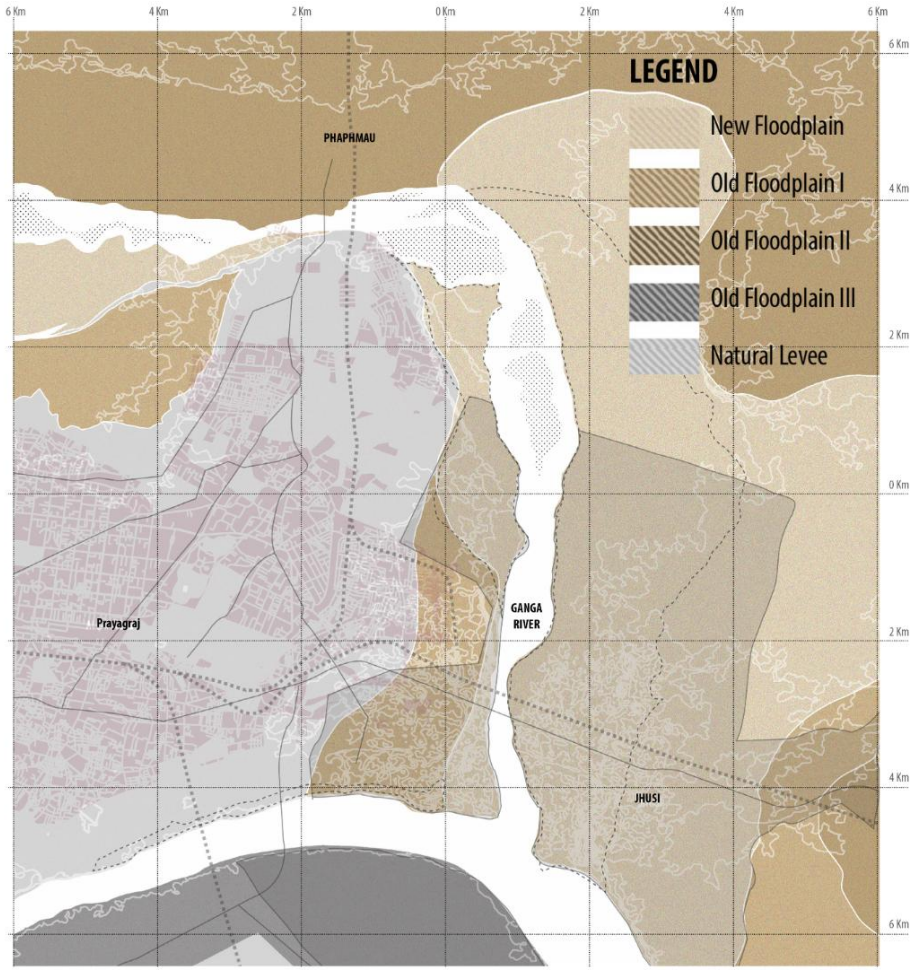
*Fig 12.5: Migration of river course (Meso scale), Figure source: Adapted as it is from Uniyal, Shah, Rao, 2018 & *C**

12.6 GEOMORPHOLOGY

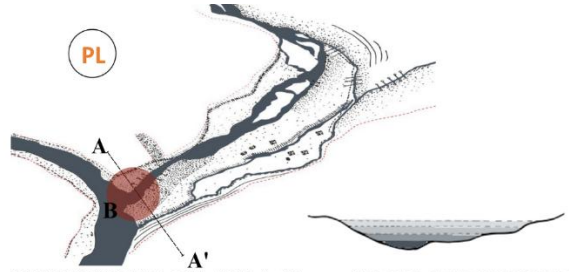
The Ganga plain basin, where sedimentation is occurring by fluvial processes, is an established underfilled basin with an excess of sediments. The former floodplain-like Upland Terrace surface is another way to split the geomorphology into II and III. (Uniyal, Shah, Rao, 2018).

The Ganga plain basin, where sedimentation is occurring by fluvial processes, is an established underfilled basin with an excess of sediments. The former floodplain-like Upland Terrace surface is another way to split the geomorphology into II and III. (Uniyal, Shah, Rao, 2018).

The older alluvium plain, also known as Varanasi older alluvium, contains terrace surface active floodplain and old floodplain I. Given that it is the youngest surface and is located at the lowest elevation relative to the other river terraces, as illustrated on the map, the active floodplain is the area of the river geomorphology that is most at risk. As seen in the figure, the "Kumbh Mela" event is held on this current floodplain and the former floodplains I and II.



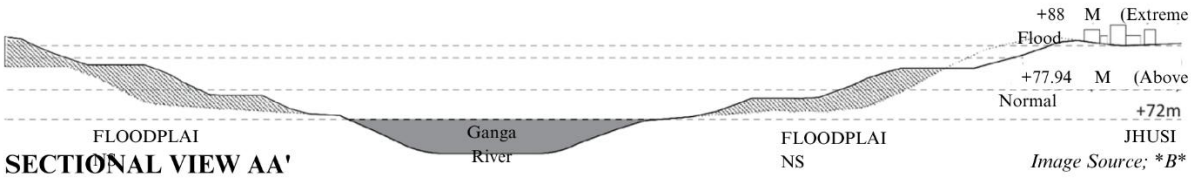
12.7 TERRAIN OF THE RIVER



SECTIONAL PLAN AA'

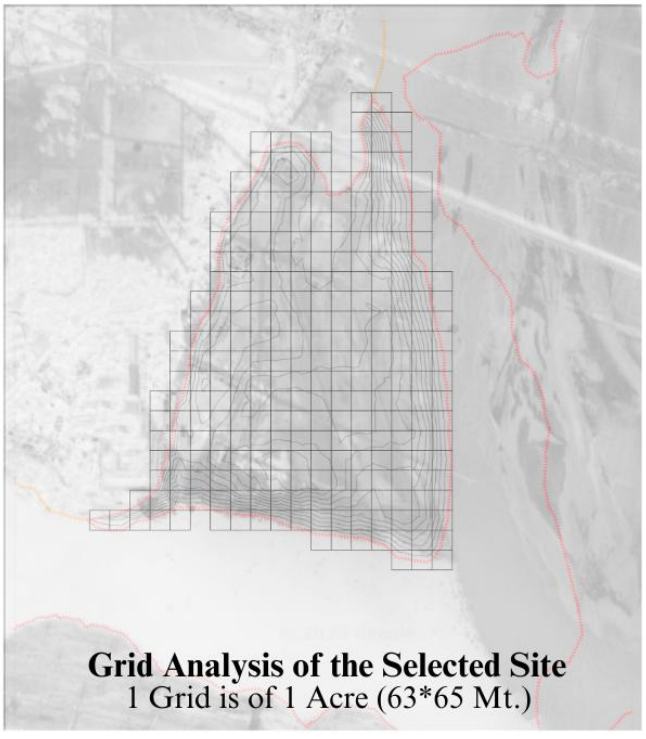
SPOT SECTION B

Uncertain and ever-changing contours make it hard to predict any kind of permanence in this scenario.

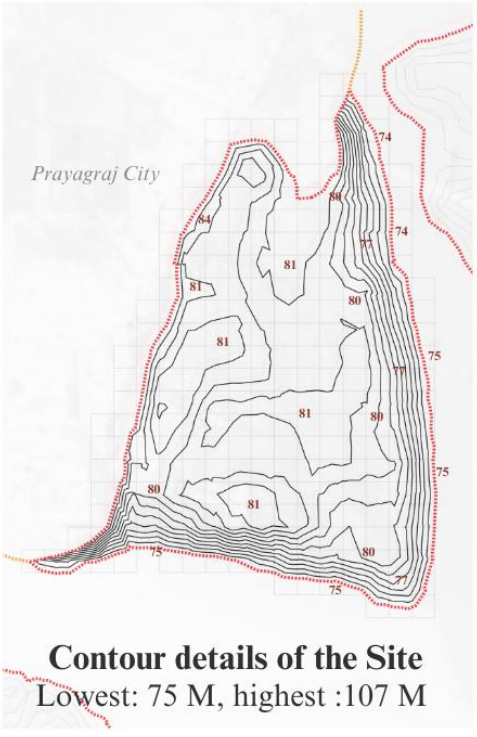


SECTIONAL VIEW AA'

*Image Source; *B**



Grid Analysis of the Selected Site
1 Grid is of 1 Acre (63*65 Mt.)



Contour details of the Site
Lowest: 75 M, highest :107 M

12.8 GRID ANALYSIS

Because Prayagraj is located to the west of the Ganga, the western floodplain land is worth more than the eastern floodplain land. The floodplains on this site are easily accessible to Prayagraj city inhabitants. Moreover, this makes the Western margin of the floodplains susceptible to urban growth and monsoon flooding. The rivers Ganga and Yamuna surround the city of Prayagraj on all three sides, as shown in the figure. As a result, floodplains are essential for future urban growth and must be safeguarded from the demands of urbanization. The Kumbh Mela celebration aids in the improvement of the Prayagraj district's civic infrastructure. As seen in the figure, most of the existing roads have been enlarged, especially those that go to the Sangam or sacred confluence.

Sun Path of Prayagraj

- Winter Solstice: Sun rises southeast, sets southwest, low arc, long shadows.
- Spring Equinox: Sun rises east, sets west, higher arc, shorter shadows.
- Summer Solstice: Sun rises northeast, sets northwest, high arc, shorter shadows.
- Fall Equinox: Sun rises east, sets west, lower arc, longer shadows.

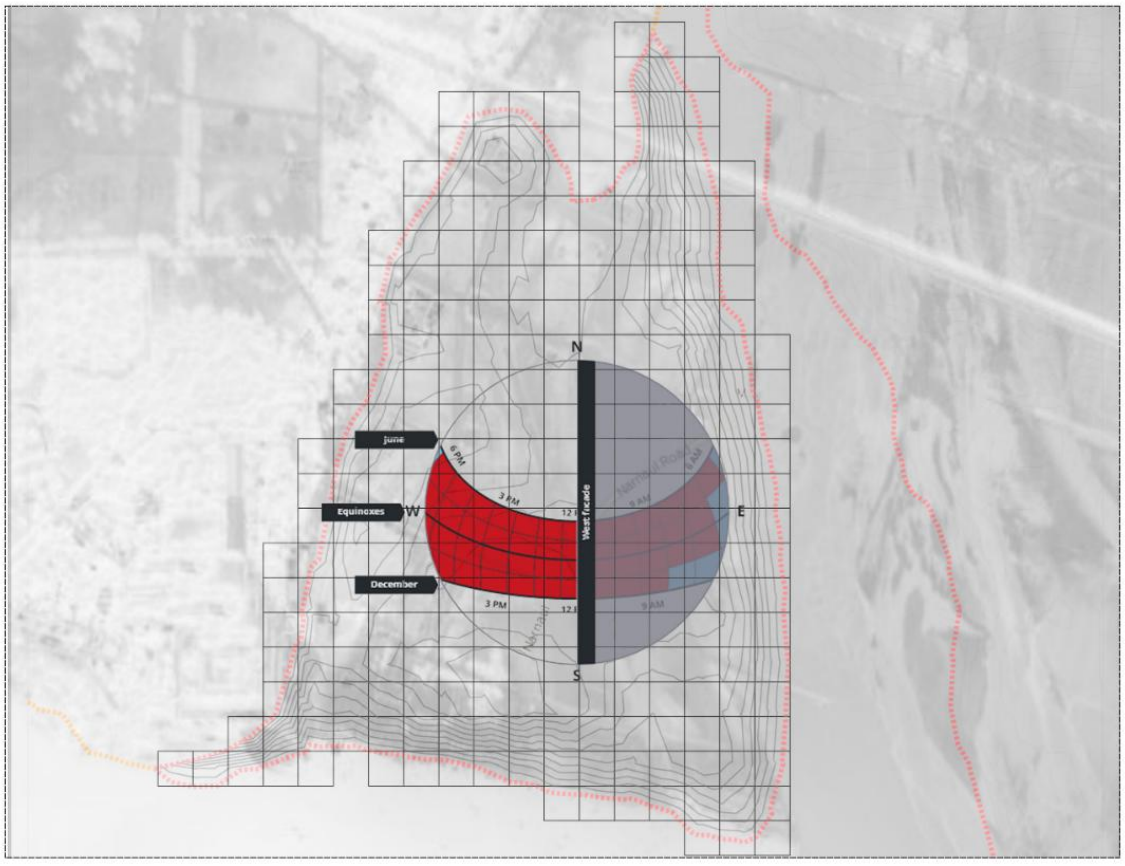
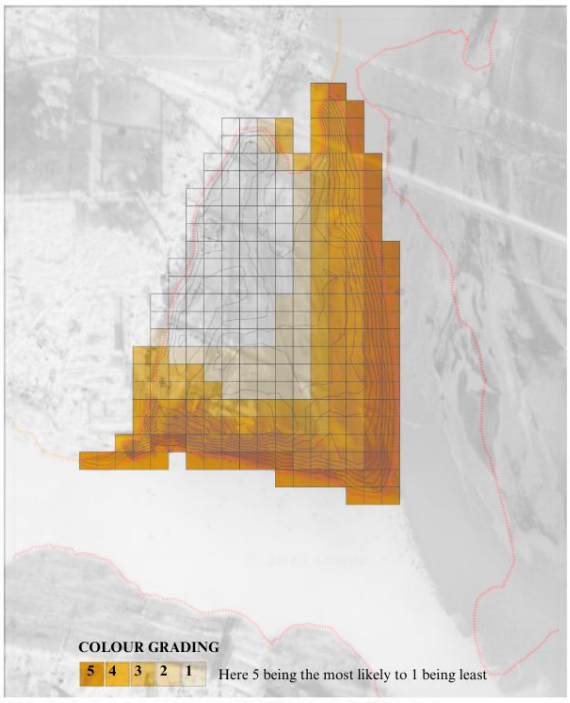


Figure source: Author

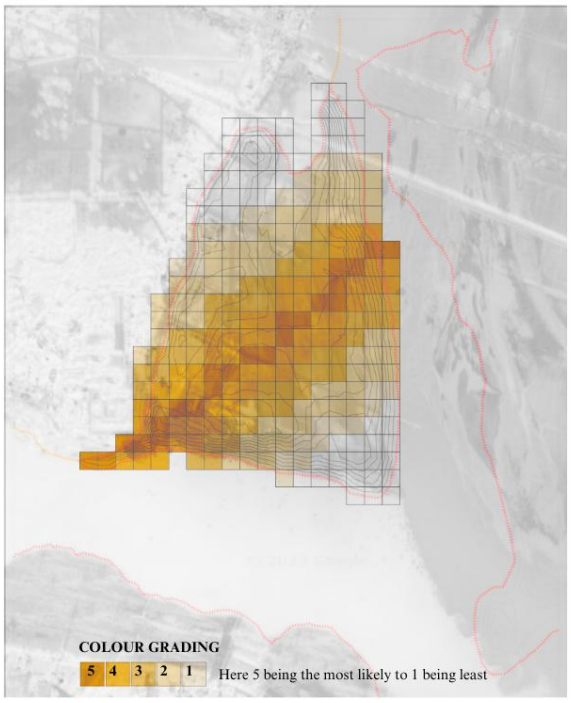
Current Available Site Boundaries

As per Google Data on 18-02-2023



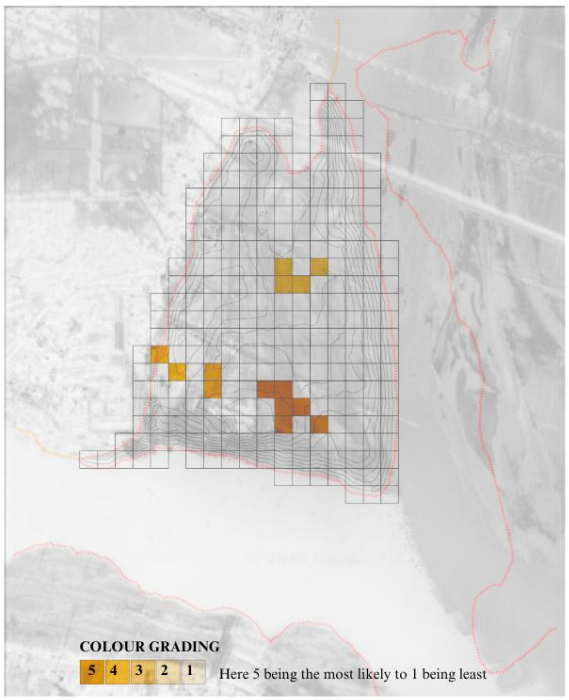
WATER BODY-KUMBH SITE

A gradual slope towards the river edges can be see, which helps drain the site



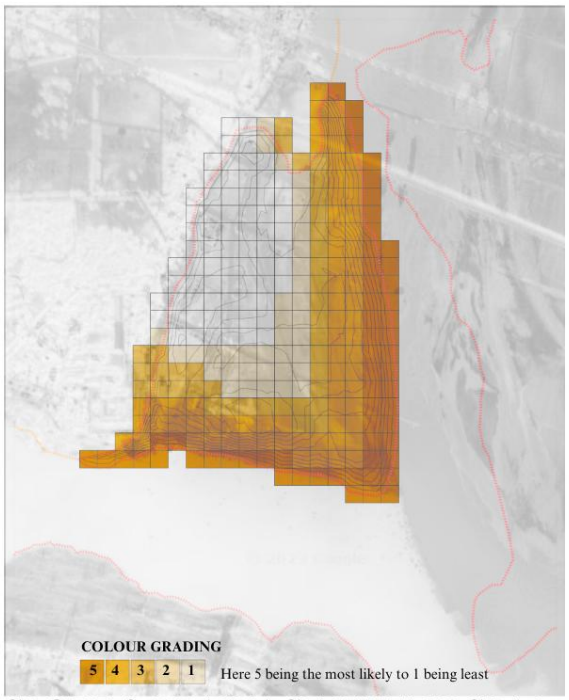
WIND MOVEMENT-KUMBH SITE

Mostly the wind is from the South West to North East, experiences returning winds.



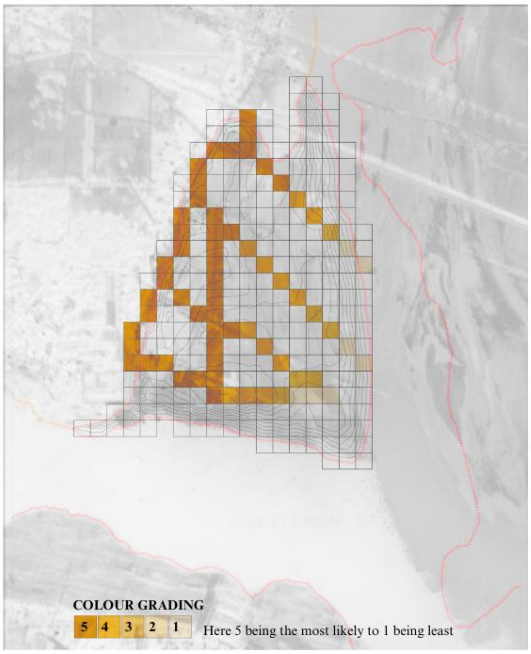
VEGETATION- KUMBH SITE

The site has near to very scarce vegetation as the site is prone to floods



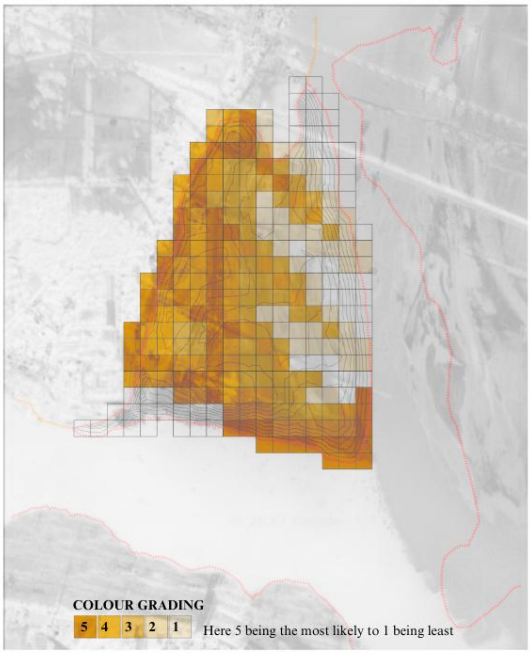
SLOPE & DRAINAGE-KUMBH SITE

The site has good slope running towards river and near to flat region in middle.



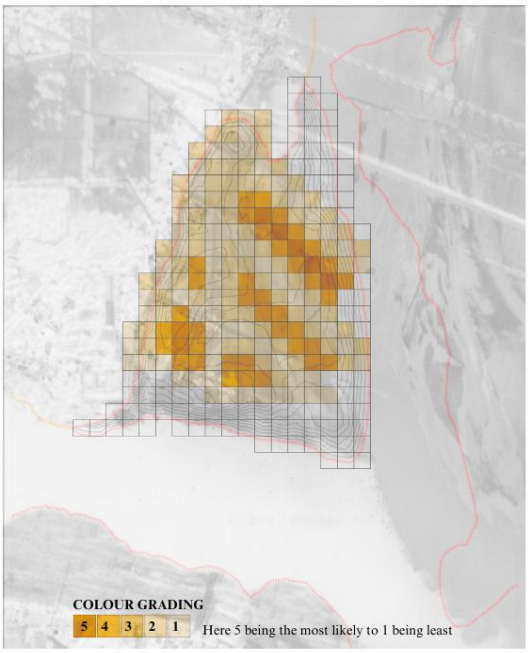
ACCESS ROUTES-KUMBH SITE

Site has Many access routes



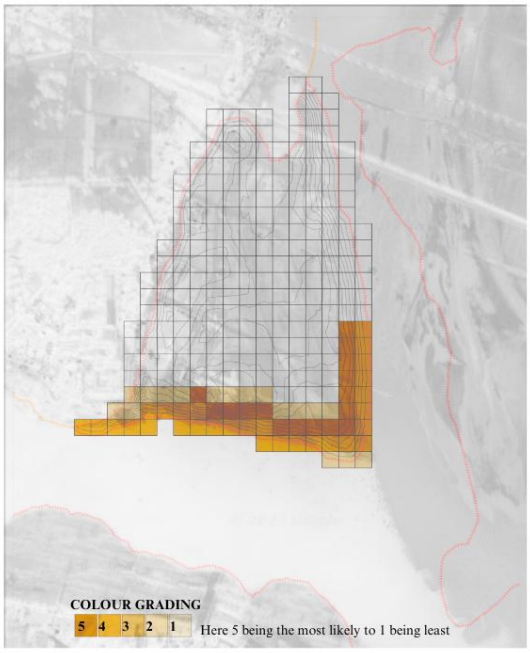
NOISE POLLUTION-KUMBH SITE

As its an open site, multiple sources of sound



PRIVACY OF THE PLACE- KUMBH SITE

Near to no privacy as its an open ground



VIEW & MOST USED AREA-KUMBH SITE

View toward rivers

CHAPTER 13: DESIGN BRIEF

13.1 ABSTRACT

In a burgeoning cosmos where automation and socio-economic shifts are unfolding at considerable furtherance, it is inadmissible for anything to endure stagnancy. In the essence of the spatiotemporal continuum, human existence is itself just at a mere split of the fingers.

Realizing that there is no dichotomy in the concept of architectural permanence is the first step in any conversation. Design is simply a moment inside an ongoing condition of material flow, nothing is permanent or impermanent; rather, everything exists at differing stages of impermanence. As individuals, we frequently associate the need to leave our mark—to leave behind a cultural symbol of creativity—with the need to create. It is worth considering why we build at all in light of the rising overconsumption of finite resources because every act of construction is equally an act of destruction.

With roots in the Sangam city, Prayagraj, I have always admired my city since it has a vibrant history and a glorious past. Having had a chance to be woven into the thread of storytellers, from the Kumbh Mela, one of the largest peaceful, religious gatherings in the world, with an estimated 120 million people visiting over the two months is as astonishing as is to see its ever-growing pack. The sheer size of the gathering raises many logistical challenges as well as for the governments that regulate and plan the Kumbh Mela. Historically, the Kumbh Mela has had issues with the control and safety of the masses of pilgrims. Part of the solution for controlling the masses of people is the careful planning of infrastructure and built complexes. The Kumbh Mela has continued to grow drastically over time and has grown into the complex mega-city that gets constructed for each pilgrimage.

This thesis will be my trivial contribution to my city. It is an investigation of various possibilities in temporary architecture and urban spaces. It aims to question and challenge the accepted assumptions of architecture in terms of time and permanence, in the context of urban landscapes. It inspects how much potential ephemeral architecture has to become a state-of-the-art model in developing cities but also will formulate and understand current models to scrutinize their capability to give contemporary remedies to changing urban dynamics and urban processes alongside conventional architectural approaches.

13.2 SCOPE

The scope of the study is very profound but aims at the interrelationship between permanence & impermanence. Execution of the Primary research works and formulation of design methods adapted and studied with the help of live literature precedent studies

A system of structure and construction that can be assembled and disassembled with extremely efficient labor and production of materials. will be developed.

The same will be a part of the final evaluation of **NIUA organized Students Thesis Competition-Season-3.**

13.3 NEED OF THE PROJECT

My research area would also look into how temporary architecture would develop new relationships with the urban built & unbuilt environment and the role of prefabrication in that context, not limited to the walls of concrete, it would explore new possible materials, techniques, and adaptive re-use possibilities in the mass reproductive scale while keeping it sustainable and nature-friendly.

The **root cause behind adhering to this specific topic** arose from some of the self-observations throughout two partially rememberable decades of my life on the coast of Holy Sangam, the lack of controlling the masses, and the troublesome planning of infrastructure and building complexes. With partial leftover remains from tents to their floating pieces during the rainy season. Inappropriate usage of resources and lack of distribution facilities. Not only limited to the tangible aspects, but negligence towards weather resilient design in harsh winters also leaves the pilgrimages to tremble in the cold winters. I have been a witness to the same, and thus as an aspiring architect and a planner, this thesis report would be my mere contribution to this reoccurring issue in the mega-city planned on the banks of Sangam.

13.4 NEED OF THE HOUR

13.5 STATEMENT OF SPECIAL INTEREST

Coming from Sangam city, Prayagraj, I have always admired my city the most, it has a rich history and a glorious past. From our first prime minister to great poets, it has it all. With buildings from the Mughals to clock towers from the Britishers. It stands on four major pillars, education, administration, architecture & tourism.

This project is my small contribution to my city. The main intent of this project will be to redesign the camping solutions on the bank of Triveni Sangam for the Kumbh Mela, dating from pre-historic times Ganga-Yamuna has been a center of attraction for many, my motive here would be to acknowledge the past and bring it to the present with my design interventions.

With an Impermanent City on the banks of Sangam, my main motive will be to help the Ganga river fight the effects of camping issues related to pollution. The holistic approach here will be to create an iconic architectural monolith/attraction which drives people of the city and outside to come and dive into the endless stories, along with recreational areas and parks, which encourage art and culture of the place. The expected result would be to enhance the economy of the city by helping different strata of society and celebrate this Kumbh Nagri not only for festive times but for its rich tradition and love.

13.6 PROPOSED FACILITIES

Facilities that will be Planned for the next Kumbh Mela in the proposed sector design

- Police Booths & Stations for both land & water
- Primary Healthcare Centres & Media Centre
- ATM’s
- Boarding/Lodging

- General Help Desk
- Lost/Found Counters or Desk
- Delegates (Akharas, Groups, Sanstha, etc.)
- Shops (General, food, medicine, books, etc.)
- Ghats
- Public Conveniences
- Parking Places
- Kiosk points
- Fire stations
- Govt. Department Offices
- I.T Centre (Including INTERNET, FAX, PCO etc.)

CHAPTER 14: DESIGN DEVELOPMENT GUIDELINES

14.1 DESIGN GUIDELINES FOR TEMPORARY BUILDINGS IN CONSOLIDATION AREAS & SINGLE TEMPORARY BUILDING INSTALLATIONS

1. SITE DEVELOPMENT GUIDELINES

a. General

- Temporary buildings should be placed in areas where existing buildings and/or dense current vegetation will block visibility from main roads and routes.
- Site selection should take into account the accessibility and service need of surrounding structures.
- Temporary structures are produced with structural floors and undercarriages of varied heights. Pit-set temporary structures are favored since they don't require as deep of excavation to install the structural undercarriage.
- The entry finish floor can be flush with the neighboring grade thanks to the pit set. This situation requires action.
- Pavement removal may be required before the installation of any temporary structure within an already-paved area to provide room for planting (refer to the landscape section).

b. Setbacks

- Temporary building setbacks should take into account the topography, mature vegetation, environmental restrictions, and long-term neighborhood development.
- Fire codes ought to be used to determine the distance between structures. It's best to prevent creating long, narrow spaces between buildings.

2. BUILDING DESIGN GUIDELINES

a. Materials

Prefabricated steel/aluminum structures with tensile sustainable frame covering, with ventilation pocket covers are the preferred materials for temporary buildings.

b. Colors

On temporary structures, it should not be permitted to use light, brilliant, or shiny colors. Use hues that fit in with the permanent structures and surrounding environment

instead. Colors must follow any approved color scheme for the region. The body color should be the same as the corner trim.

c. Mechanical and Utility Equipment

- Mechanical equipment should be placed in the least noticeable area and screened by architectural or natural features. If installed atop a structure or surrounded by landscape, equipment should be painted to visibly mix in with the building's body. Building-mounted equipment should match the complex's designated color scheme in terms of paint color.
- It is essential to take into account how much noise will affect nearby structures while placing equipment.
- To determine the proper setback of an electrical transformer from a structure, it is recommended to consult with a fire and electrical engineer.

d. Foundation and Under-Floor treatment

- To avoid ramps and steps and to reduce the mass of the structures, pit-set temporary buildings are preferred.
- Toto conceal unattractive underfloor anchoring supports and ties, temporary building installations that are not pit-set must have a full-skirt treatment around the perimeter.

e. Service Areas/Trash Facilities

The complex's trash collection facility ought to be tucked away and screened by a fence and/or landscaping materials.

3. LANDSCAPE GUIDELINES

a. Landscape Concept

It is strongly preferred to keep important existing mature trees in place rather than remove them.

b. Pavement Removal

Temporary buildings built within existing paved areas require the removal of pavement within ten feet of the building to offer a sufficient landscaping treatment. If it is determined that displacing existing parking and the associated costs will be too onerous for the project, exceptions from this requirement may be taken into account.

c. Plant Palette

The campus landscape regulations that are relevant must be followed by new plantings. Within consolidation areas, any unplanted or unpaved open space areas must be covered with the proper mulch materials.

d. Site Furnishings

- Benches, tables, and overhead shade structures should be part of the outdoor amenities.
- There should be readily accessible bike racks.

- When two structures are proposed to be parallel to one another, they should be spaced apart by at least half their lengths to prevent blank walls or direct window views between them from blocking out attractive vistas.

c. Grading

- Grading should be kept to a minimum when placing temporary buildings. It is strongly advised against grading that might destroy mature trees already there.

d. Access *(Service, Vehicular, and Pedestrian)*

- Fire equipment access must be possible at the location. Wherever possible, it should be taken into account and accommodated so that service trucks have easy access. All buildings and busy outdoor areas must provide pedestrian access that complies with accessibility standards

e. Common Open Space

- The residents in consolidated temporary building complexes should have access to a shared outdoor area. These areas should be planned to suit accessibility needs and enhanced to encourage outdoor social gatherings and pedestrian traffic.

4. SINGLE TEMPORARY BUILDING INSTALLATIONS

For installations of a single temporary building, the following additional regulations shall apply.

- To obtain appropriate landscaping results, temporary buildings situated on improved pavement may make use of landscape containers.
- It is forbidden to remove already existing, healthy, mature trees.
- Full-skirt treatments are required around the outside of single temporary buildings to conceal unattractive floor anchoring supports and ties. It is not advisable to put a single temporary building in a pit

.

14.2 GENERAL REQUIREMENTS

- The materials, design, construction, and fabrication of structures or devices within the scope of this standard shall meet the requirements for resistance to fire of a minimum of 10 minutes or total evacuation time whichever is more.
- Each temporary structure shall be permitted only in Fire Zones No.1 & 2 as the case may be, according to the purpose for which these are to be used, by special permit from the authority for a limited period and the provisions of this standard shall be complied with.
- Such temporary structures shall be completely removed on the expiry of the period specified in the permit.
- The choice of materials for such constructions shall preferably be of non-combustible or fire resistance type. The materials used for the decor shall be such that they shall not generate toxic smoke/fumes. Wherever materials of combustible nature are used these shall be treated with a fire retardant material of Class-I flame spread of IS 12777.
- The main structure shall be erected with at least a 100 mm diameter post of non-combustible material or wooden post (preferably of sal, casuarina, or bamboo) and the rest of the structure may be of lighter poles and trusses tied/screwed properly with steel wire. The poles and trusses shall be nailed/screwed, wherever required. All supporting members shall be of sufficient size and strength to support the structure.
- The height of the ceiling of the structure or pandal from the ground shall not, in any case, be less than 3 m.
- No decorative paper/synthetic material shall be used anywhere in the pandal/structure.
- All fabrics and decorative clothing used in the construction and decoration of the structure shall conform to IS 15612 (Part 1) and IS 15741.
- No nylon or synthetic ropes shall be used anywhere in the structure. Only ropes made of coir, manila, or coconut fibers shall be treated with fire retardant solutions in accordance with 3.2 before use.
- Temporary structures shall be adequately guyed/ braced and made secure to withstand a wind pressure of 0.98 kN/m2 (0.01 kgf/cm2).
- In no case, the height of the corridor/passageway shall be less than 3 m.

14.3 LOCATION

- There shall be a clear space of 4.5 m on all sides between the structure and the adjacent buildings or other structures. In cases where temporary structures are erected in the lawns which are part of residential premises, the entire frontage shall be kept open.
- No temporary structure shall be erected beneath and adjacent to any live electrical line. The gap between the live wires and any part of the structure shall in no case be less than 2 m.
- No temporary structure shall be erected near the furnace, railway line, electrical substation, chimney, or under high tension wire or like hazard unless a safety distance of 15 m is maintained.

14.4 ENCLOSURE & EXITS

- All sides of the temporary structure shall be left open. If this is not possible for certain reasons, the lower portions of the side walls shall not be fixed.

- Where provisions laid down in 7.1 cannot be adhered to, adequate and unrestricted exits shall be provided, depending on the capacity of the assembly, as given in 7.3 to 7.9.

- A minimum of two exits of not less than 2.5 m widths separately, located at extremities from each other, shall be provided for any type of temporary structures.

- Each of the exits shall be a minimum of 3 m wide for larger pandals and these exits may be provided after a gap of 10 m.

- The clear width of exits shall be determined on the basis of not less than one unit of 50 cm for every 50 persons to be accommodated. The width of each exit shall not be less than 2.5 m.

- The line of travel from any seat to the nearest exit on the seating area shall not be greater than 15 m.

- All exit points shall be clearly indicated with sign 'EXIT' (including in local language) over each doorway or opening in plainly legible letters (not less than 5 cm high and with principal strokes of such letters not less than 1.8 cm in width) enabling everybody in the auditorium to visualize the exit points easily. Fire protection-safety signs and fire protection plans shall be in accordance with IS 12349 and are 12407.

- Exit light should be adequately illuminated with a reliable light source when the structure is occupied by the public. Suitable directions signs shall be displayed in a conspicuous location to indicate the proper direction of egress. Exit and direction signs shall also be painted with fluorescent paint. Doors wherever fitted to exits shall open outwards and shall not be closed or bolted during the presence of persons in the structure.

- The emergency lighting shall be provided to be put on within 20 s of the failure of the normal lighting supply.

- Cross gangways shall be provided affording passage after every 10 rows of seats, the width of the such passage being not less than 1.5 m.

- Longitudinal gangways shall be formed at the sides and central portion. The width of the side longitudinal gangway shall be not less than 1.2 m and the central longitudinal gangway shall be not less than 1.5 m. Each row (between side and longitudinal

gangway) shall comprise of not more than 12 seats. The seats shall be tied up together in a bank of not less than 4 seats and secured to the ground.

- The seating arrangement shall be such that the clearance between the rearmost point of the immediate front seat and the foremost point of the next rear seat in two successive rows is not less than 55 cm. Where self-folding seats are provided, and the clearance between the two rows may be reduced, in any case, shall be not less than 30 cm.

14.5 MEANS OF ACCESS

- All temporary structures shall be approachable and the gate provided shall have a clear opening of 5 M arch way shall not be at a height less than 5 m from the ground level.

- The temporary structure shall be approachable to the fire engine. No part of temporary structures shall be more than 45 m away from the motorable road.

14.6 CAPACITY & HOLDING

- The capacity of any temporary structure or pandal or enclosure for outdoor assembly shall be the number of fixed seats plus an allowance of one person for each 0.50 m2 of floor area designated or used as standing
- space or for movable seats. A distance of 450 mm along any undivided bench or platform shall constitute one seat in computing capacity. The floor area or ramps, aisles, passageways or spaces within such structures of enclosures used for access or circulation shall not be considered in computing the capacity of a place of outdoor assembly, and shall not be used for access or circulation and shall not be considered in computing the capacity of a place of outdoor assembly, and shall not be used for seats or for standing.

- The number of persons admitted to any place of outdoor assembly shall not exceed the capacity as computed in accordance with the provisions of the above point

14.7 ELECTRICAL ARRANGEMENTS

- The temporary lighting of the structure shall be installed by a licensed contractor. The load per circuit, insulation test, and installation shall conform to IS 1646.

- All electrical wirings in the structure or pandal shall be in PVC sheathed conductors or vulcanized rubber cables of tough rubber and all joints shall be made with porcelain insulated connectors. Twisted and tapped joints shall not be permitted.

- No part of an electrical circuit, bulbs, tube lights, etc, in the structure of the pandal shall be within 15 cm of any decorative or other combustible material. 8.4 In case incandescent gas portable lights instead of electricity are used in the structure or pandal,

such lights shall not be hung from the ceilings of the main structure or pandal but shall be placed on separate stands securely fixed.

- No halogen lamps shall be used anywhere inside the pandal/temporary structure.

14.8 FIRE PROTECTION MEASURES

- The ground enclosed by any temporary structure, pandal tent, or shamiana, a distance of not less than 4.5 m outside of such structure shall be cleared of all combustible materials or vegetation and any materials obstructing the movement.

- Storage of combustible materials like shavings, straw, flammable and explosive chemicals, and similar materials shall not be permitted to be stored inside any temporary structure.

- No fire works or open flame of any kind shall be permitted in any temporary structure or in the immediate vicinity.

Open Fires

- No open fires except small-size controlled fires as for religious purposes shall be permitted inside or near the pandals or other temporary structures. 9.5 Kitchen area for cooking snacks/food shall be totally segregated from the main pandal/temporary structure and preferably made of GI sheets.

14.9 FIRE FIGHTING ARRANGEMENTS

Provision of Water for Fire Fighting

- Supply of water shall not be less than 0.75 l/m2 of floor area for each pandal or other temporary structure. The water shall be stored in buckets/drums and kept in readiness for use. Half quantity may be kept inside the temporary structure and the other half outside in its immediate vicinity. The buckets or receptacles stating water shall at times be readily available for immediate use for dealing with the fires.

- A minimum number of fire buckets at a rate of two buckets per 50 m2 of floor space and one water type extinguisher, 9 l capacity, per 100 m2 of floor space shall be provided in all temporary structures. For the protection of electrical installation, one carbon dioxide or ABC Dry Powder extinguisher of adequate size shall be provided for each switch gear, main meter, and stage area. The location of this equipment shall be such that they are easily accessible in the event of a fire. The number of fire buckets and other various types of extinguishers may be provided as stipulated by the local licensing authority/fire authority or as per IS 2190.

14.10 MAINTENANCE

- All temporary structures shall be maintained in a safe and sanitary condition. All devices or safeguards which are required by this standard shall be maintained in good working condition.

- All temporary structures shall be periodically inspected and any deterioration and defect observed shall be brought to the notice of the authority for remedy.

- Particular attention shall be paid to ensure that the means of escape and gangways, exits, etc are not obstructed in any way and that all buckets and extinguishers are easily visible and accessible before the public is admitted at any time.

14.11 LIFE SPAN OF SHELTER MATERIALS

- The end-of-life stage analysis examines if the materials of a shelter could be re-purposed, recycled, up-cycled, or down-cycled. While recycling is the process used to make waste or other materials suitable for reuse, the goal of up-cycling is to prevent wasting potentially useful materials by making use of existing ones with little or no change.

- With down-cycling on the other hand, the recycled material decreases in value with each reprocessing. If the materials can be recycled but there are no recycling facilities in the country of implementation, then the recyclability option is not considered.

Table A: Baseline data used to calculate the CO_2 emissions and water waste due to material production

Type of material	Average quantity (in kg) of CO_2 emitted per kg of material produced	Average quantity of water used (in liters) per kg of material produced
Plastic (PE)	6 kg of CO_2 emitted for 1 kg of PE produced	17 l of water used for 1 kg of PE
Steel	2 kg of CO_2 emitted for 1 kg of steel produced	705 l of water used for 1 kg of steel
Cement	1 kg of CO_2 emitted for 1 kg of cement produced	0.2 l of water used for 1 kg of cement
Burned bricks	0.3 kg of CO_2 emitted for 1 kg of bricks produced	Depending on brick density
Glass	0.8 kg of CO_2 emitted for 1 kg of glass produced	5.8 l of water used for 1 kg of cement

Source: UNHCR Guidelines

- Advance intimation shall be given to the fire service department of the proposed construction of any temporary structure or pandal for public functions, its location, size and type of temporary structure, number of people expected to be accommodated, arrangement of exits, etc.

- The local licensing authority may recommend the provision of stand-by fire service at any temporary structure if such a measure is deemed necessary. In such cases, adequate water supply for the fire fighting service shall be ensured.

- A responsible person shall always be made available at the site of the temporary structure to organize a prompt evacuation, and fire fighting to deal with emergencies at the incipient stage, and inform the fire service. The emergency fire service telephone number shall be displayed prominently.

14.13 DISASTER PREPAREDNESS

1. SEISMIC RESISTANCE

- Earthquake-resistant structures are intended to withstand the largest earthquake of a certain probability that is likely to occur at a specific location.

- For the purpose of this overview we will assesses if the shelter design is appropriate to withstand a seismic risk in the area of implementation. In general light weight, single-story structures, such as emergency shelters are less prone to seismic risks (no major risk of collapse)

2. FLOOD MITIGATION

   There are several different kinds of a flood, and each one bears a different impact in terms of how it occurs, how it can be forecasted, the damage it causes, and type of mitigation or adaption measures that need to be put in place to prevent major damage, inluding temporary evacuation or relocation.

3. WIND RESISTANCE

- Wind exerts pressures (inward or outward) on all exterior shelter surfaces. If a shelter's exterior cladding does not have the capacity to resist these pressures, the structure behind it must.

- Structural components and cladding in a shelter or structure must be anchored to resist wind-induced overturning, uplift, and sliding, and to provide continuous load paths for these forces to the foundation.

4. STRUCTURAL RESISTANCE

   The structural resistance analyses the behavior of a shelter typology in the event of a natural hazard (winds, floods, and earthquakes). Not all the shelters and their variations

will be assessed in all of these categories. A specific shelter typology will only be assessed against the risks of natural hazards occurring in the area of implementation – **context-specific assessment.** If the area of shelter implementation is not subject to flooding, extreme winds, or earthquake activity, the shelter will not be assessed in this regard.

14.14 DESIGN GUIDELINES

1. HOSPITAL DESIGN GUIDELINES

AREA REQUIREMENTS

- Area requirement for the hospital is to be derived from the carpet area of various services and functions as outlined in the functional program by applying conversion factor for circulation space. The circulation space will include corridors, stairs, fire escapes, walls, ramps, lifts, etc.
-
- While applying a 40 percent conversion factor over a carpet area of 66 meter square per bed, the covered area of the hospital works out to 92.5 meters square per bed.
- Land requirement depends on factors, like, horizontal or vertical development, FAR (floor area ratio) regulations, and ground coverage regulated by local self-government municipal regulations correlated to the availability of land. Area requirement can thus be calculated with the above parameters assumed asunder:

- Total hospital beds 100; Number of stories 3; By placing 40 percent of the area on the ground floor and remaining on 2 upper floors,

- Municipal regulations F. A. R 100
- Ground coverage permitted 25 percent
- The covered area per bed is 92.5-meter square
- Total covered area **92.5 X100 = 9250 meter square**
- 40 percent of the covered area of 3700-meter square

- Since the ground coverage allowed is 25 percent, the plot area will be 4 times 3700-meter square, that is, 14800-meter square or 1.48, say, 1.5 hectares.

The land requirements can be reduced or increased if the hospital is intended to be a high or low-rise building contrary to the above parameters.

SITE PLANNING

- Hospital sites with a high degree of sensitivity to outside noise should be avoided but may be compatible with other considerations, such as accessibility and availability of

services. The buildings should be so planned that sensitive areas, like, wards, consulting and treatment rooms, and operation theatres are placed away from the outdoor source of the noise.

- While planning the hospital building, the importance of landscape elements, such as open areas, and horticulture to increase the comfort conditions within the recommendations contained in IS 7662 (Part 1), may be kept in view.

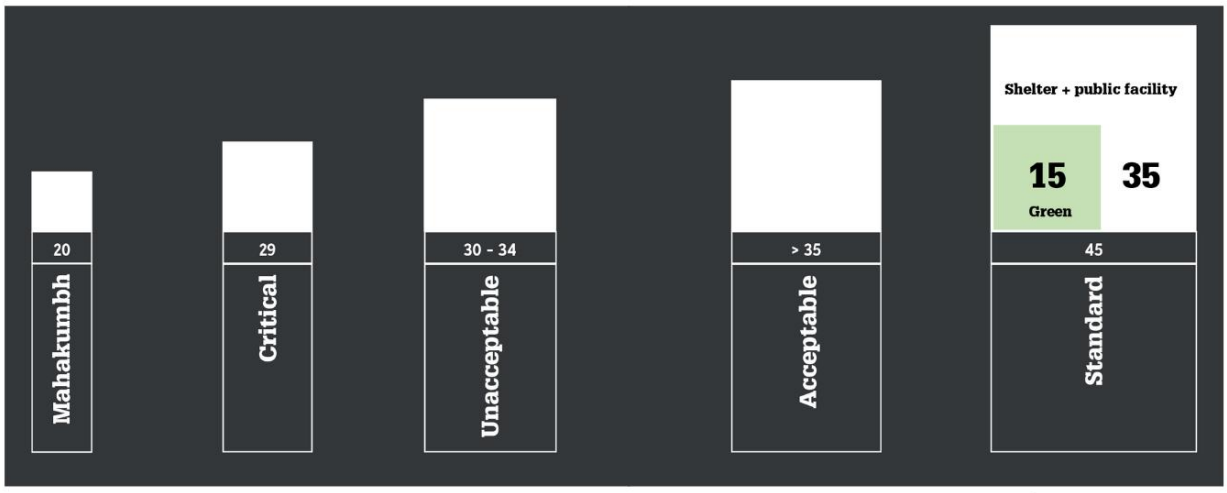
RESIDENTIAL ACCOMMODATION

- If adequate land is not available, residential accommodation for the essential staff only which includes resident medical officers, nurses, and class IV staff should be provided.
- For patients' relatives, some accommodation, like a shelter home, may be provided.
- Residential accommodation for a significant portion of nursing staff should be provided close to the hospital building in the form of a hostel.

AREA REQUIREMENT PER BED IN A HOSPITAL As per IS.12433.2.2001		
Particulars	Area per Bed (Sq M)	
Entrance Lobby	4.2	
Ambulatory	9.31	
Diagnostic services	5.95	
Intermediate care area	15.75	
Intensive care area	1.96	
Critical care area	4.69	
Therapeutic services	8.75	
Hospital services	7	
Engineering services	3.92	
Administrative/Ancillary services	4.48	
TOTAL	66.01	
Add 40 percent for circulation space including corridors	26.4	
GRAND TOTAL	92.5	per Bed
For 100 Bed Hospital	92.5*100	**9250** Sq M
For 30 Bed Hospital	92.5*30	**2775** Sq M

Kumbh Mela - Critical Aspects

The site is fragmented into various fractions based on requirement for each family and its ancillary functions. The main site is divided into 4 sectors which is further divided into 4 block with 16 communities in each block.



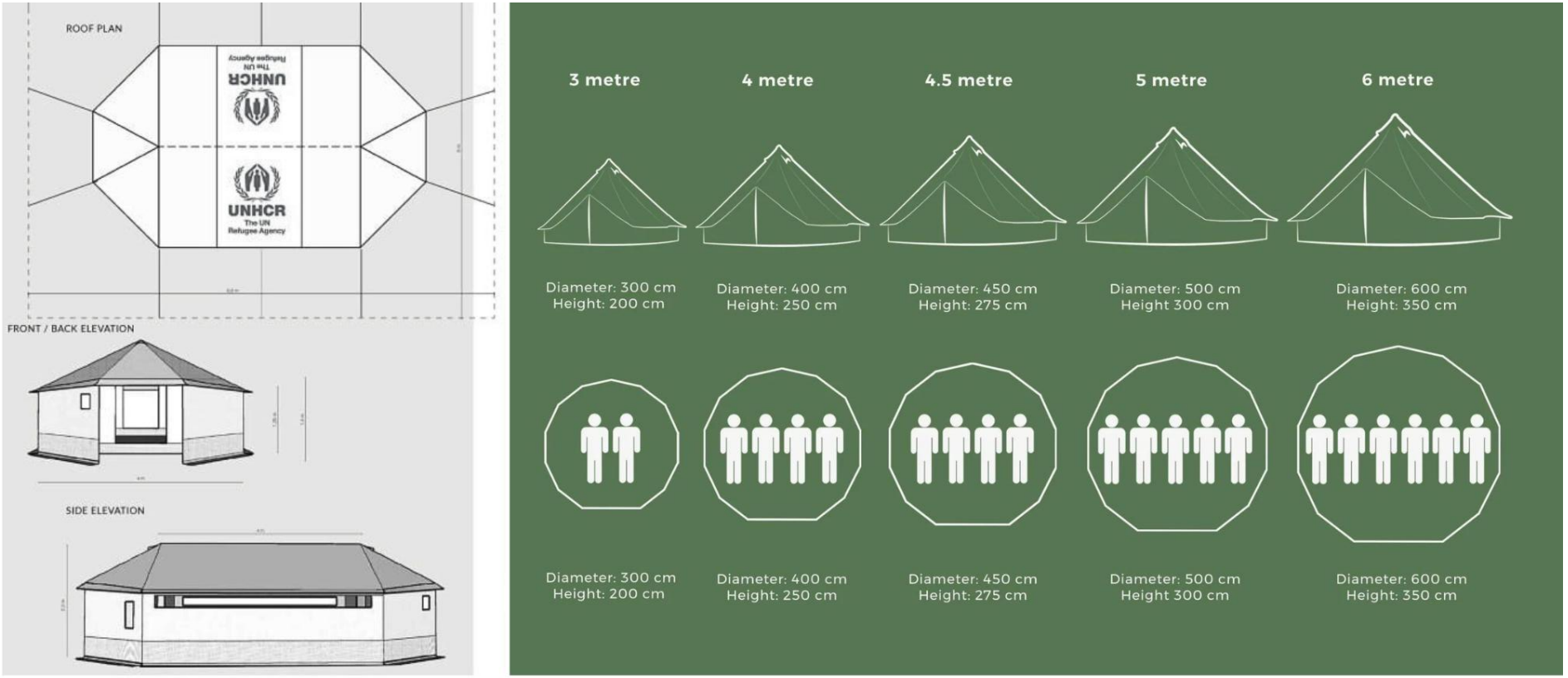
The following figures show that Kumbh provides less than acceptable area per person. For design requirements, 45 sqm per person is being taken in accordance with the UN-Refugee agency emergency standards.

Average camp area - 45 sqm/person
Minimum covered area - 4.5 sqm
Minimum ceiling height - 2m

Above are Images adaptations from a study conducted by TU Delft.

Requirement	Justification	Implementation in the design of the pavilion
Transparency	Providing a good view of the road to passengers at the stop, passers-by and drivers. The accessibility of the view to architectural elements of buildings and streets	The use of transparent materials, planning structure that provides access to natural light, good artificial lighting
Control	Providing minimal time for orientation and control of transfer	Placement of necessary signs and indexes taking into account ergonomic requirements for maximum availability
Information	Ensuring a minimum time for deciding on further action	Equipment of stops with electronic displays with information on the location of buses and maps of routes.
Protection, comfort	Ensuring the protection of passengers while waiting for transport from the influence of adverse weather conditions.	Roof, rear and side walls. Use of materials with anti-vandal protection. Presence of a bench.
Safety	Reducing the number of crimes	Creating a space-planning structure that excludes isolated spaces
Land use rationality	Different sections of roads require pavilions of different sizes	Differentiation of pavilions of waiting by capacity and layout. Modular design.

Fig : Showcasing no. of toilets required, Source : global-uploads.webflow.com



The Kumbh Village claims 20 years of hosting travelers at the Kumbh Mela. The campsite is located on a 10-acre plot of land close to the main bathing ghat—helpful if you're considering a dip in the freezing waters at the crack of dawn. Kumbh Village offers three kinds of accommodation—Luxury and Deluxe get you your own tent for two, with and en suite bathroom, while the Economy option is a dorm-style, 10-bed affair. All guests are invited to satsangs and chats with visiting sadhus, bonfires at night and other cultural programmes. Add-on services include yoga, astrology and reiki sessions, a private boat tour and, should you feel like it, a nice, warm massage.

3. CONTAINER DESIGN GUIDELINES

In 1956, the shipping or goods container was created, revolutionizing international trade. For this CTU, there has been no going back since that time. (Cargo Transport Unit).

The container, which comes in a variety of shapes and sizes, is constructed from a number of structural elements that combine to produce a solid rectangular structure capable of holding a range of cargo.

The main structural components are :

- Roof
- Side Walls
- Floor
- Cross Members
- Top/Bottom Rails, and
- Corner Posts

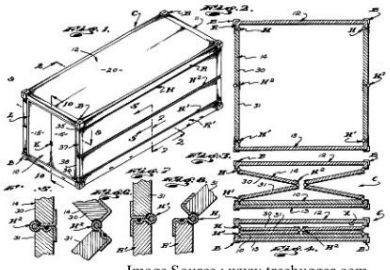
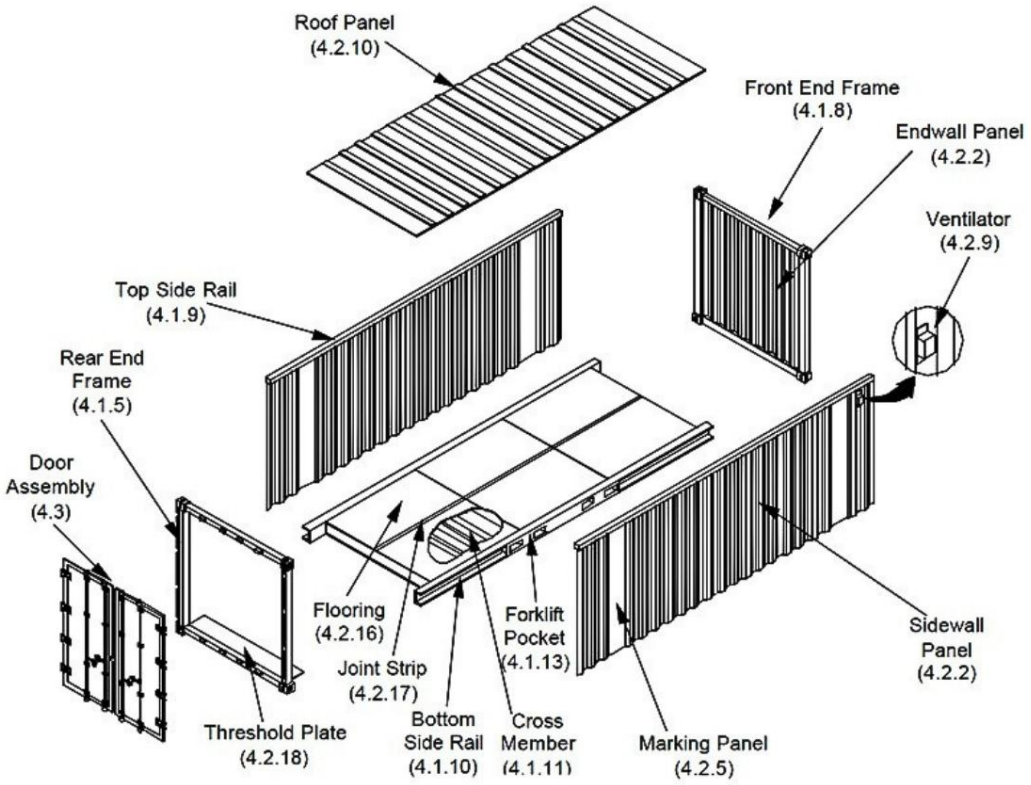
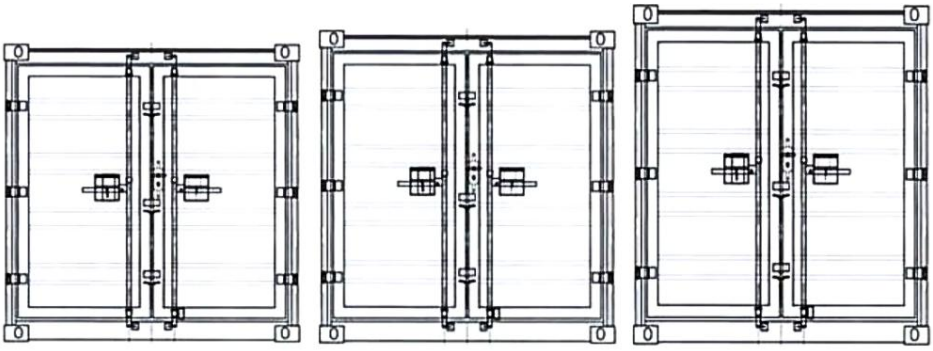


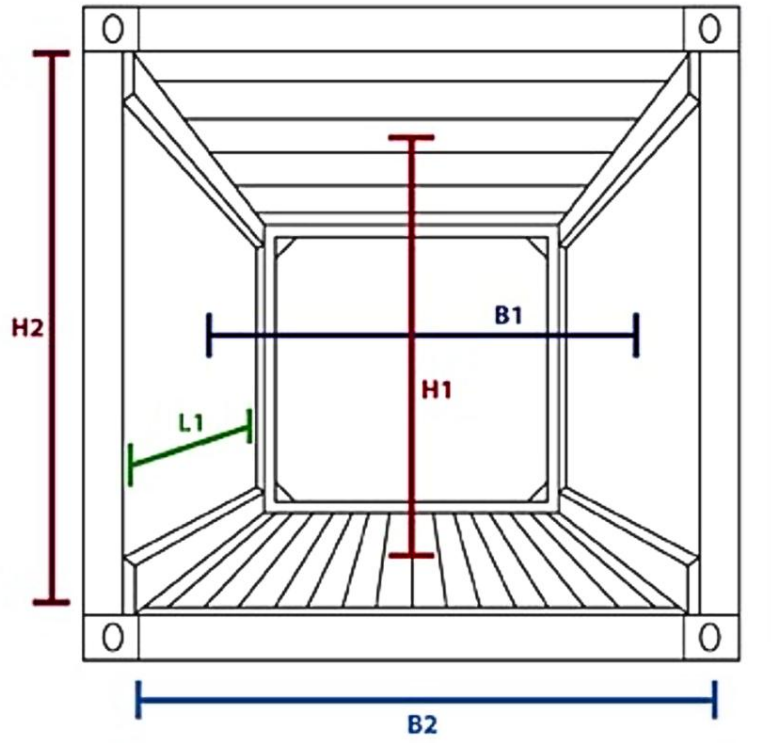
Image Source : www.treehugger.com

Folding Detials



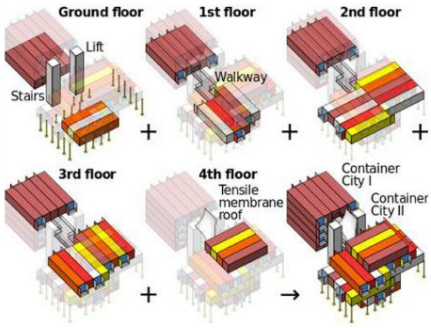


Low-Cube (H = 2.438 mm) Standard (H = 2.591 mm) High-Cube (H = 2.896 mm)



	Interior dimensions			Door dimensions		Cubic capacity average
	L1	B1	H1	B2	H2	
20'DV (8'6" hight)	5895 mm	2350 mm	2390 mm	2340 mm	2290 mm	33 m³
40'DV (8'6" hight)	12000 mm	2350 mm	2390 mm	2340 mm	2290 mm	67 m³
40'HC (9'6" hight)	12000 mm	2350 mm	2690 mm	2340 mm	2590 mm	76 m³

Toshiko Mori Architect, "Container City" (2001). Building Case Studies. 20.



Architect: Toshiko Mori Architect

Owner: Container City

Year of completion: 2001

Climate: Marine West Coast Climate

Material of interest: Shipping containers

Application: Units

Properties of material:
Low cost
Reusing materials
High strength, prefabricated steel modules
Cuts construction time in half
Minimizes site disruption; storage container buildings can easily be removed from a site and used elsewhere.

Material used: Forty-foot equivalent unit shipping containers

Sources:
architect website: www.containercity.com/

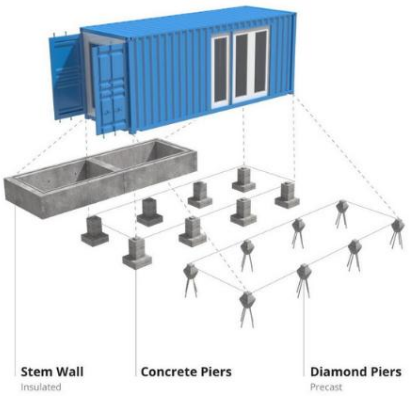


Image Source : www.re-thinkingthefuture.com

Sub Structure Details, as we have a sandy base we can use diamond piers or a flat plate of metal as base to have distributive loads

Image Source : alibaba.com

Two ways to fold these shipping container modules

DIMENSION CHART

	EXTERIOR DIMENSIONS			INTERIOR DIMENSIONS			DOOR OPENING DIMENSIONS	
	LENGTH	WIDTH	HEIGHT	LENGTH	WIDTH	HEIGHT	WIDTH	HEIGHT
10 FOOT CONTAINER	10'	8'	8'6"	9'3"	7'8"	7'9 7/8"	7'8"	7'5"
20 FOOT CONTAINER	20'	8'	8'6"	19'3"	7'8"	7'9 7/8"	7'8"	7'5"
40 FOOT CONTAINER	40'	8'	8'6"	39'5"	7'8"	7'9 7/8"	7'8"	7'5"
40 FOOT HIGH CUBE CONTAINER	40'	8'	8'6"	39'5"	7'8"	8'10"	7'8"	8'5 1/2"
45 FOOT HIGH CUBE CONTAINER	45'	8'	8'6"	44'5"	7'8"	8'10"	7'8"	8'5 1/2"

Image Source : containeryard.com

CAPACITY CHART

	CUBIC CAPACITY	TARE WEIGHT	MAX GROSS	MAX PAYLOAD
20 FOOT CONTAINER	1,165 CU. FT.	5,050	67,200	62,150
40 FOOT CONTAINER	2,350 CU. FT.	8,000	67,200	59,200
40 FOOT HIGH CUBE CONTAINER	2694 CU. FT.	8,775	67,200	58,425
45 FOOT HIGH CUBE CONTAINER	3043 CU. FT.	9,810	72,800	62,990

CHAPTER 15: DESIGN DEVELOPMENT

The Design development started with the thought of temporality and reversibility, learning from the Kumbh Mela, I could suggest that it is time for urbanism and design to find new ways for effectively factoring in temporalities as critical components of institutional and technological orthodox. For engaging in this discussion, the exploration of temporal landscapes opens a potent avenue to explore by questioning permanence as a univocal solution for urban conditions. Below is one such exploration of container village from US.

15.1 PROJECT CONCEPT

The idea of temporary architecture has been in practice since man's most basic dwelling began. From prehistoric times, we've seen temporary architecture getting used for emergent situations, wartime, pop-ups, and exhibition spaces. But today we see projects that are developed with temporary architecture that show innovative ideas for the long run of architecture and urbanism. Here the inspiration came from the Lego blocks and merging that idea with shipping container.

FIG : Infographic showcasing the project concept, Source: www.pnegg.com

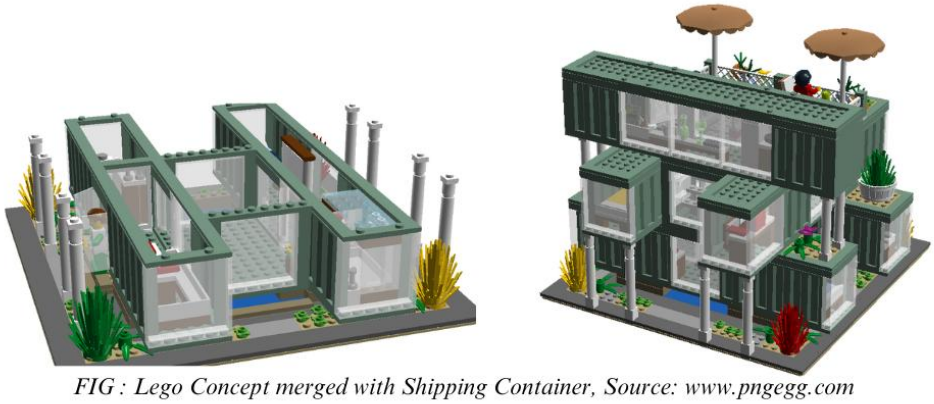


FIG : Lego Concept merged with Shipping Container, Source: www.pngegg.com

15.2 CONCEPT FORMULATION

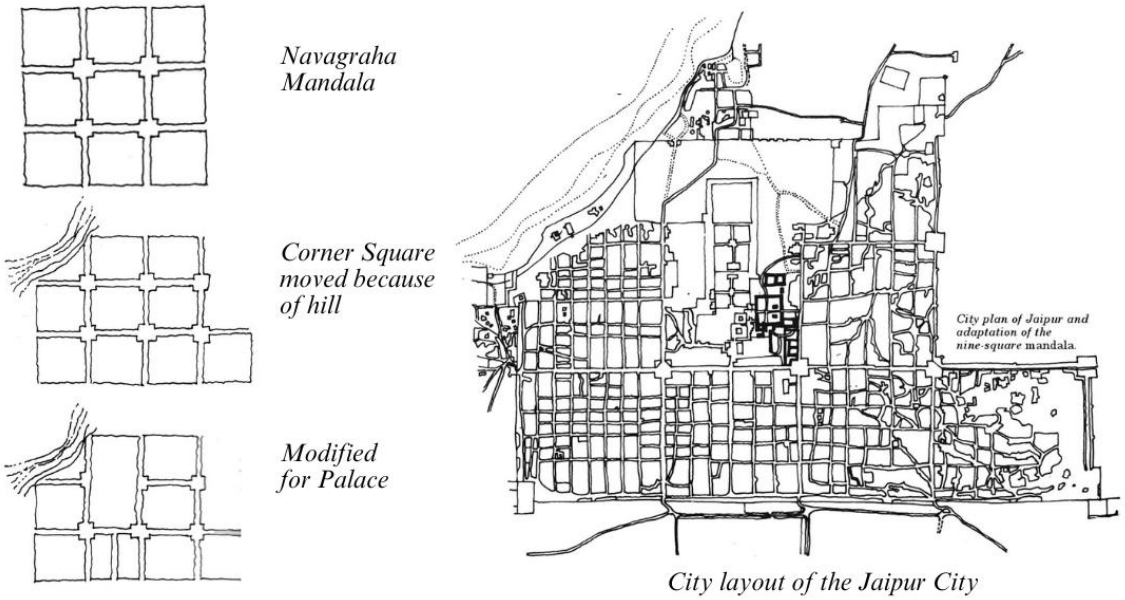
What is Culture?

Culture is a general word that refers to social behavior and norms present in human societies as well as the people that live in these groups as well as their understanding, beliefs, arts, laws, conventions, talents, and habits. A cultural center is frequently a gathering place in small communities in which individuals congregate to preserve traditions and create cultural activities that involve the participation of the entire family. People acquire heritage through the cognitive processing of enculturation and socialization, as is demonstrated by the similarities and differences across societies.

City Planning of Jaipur City

Jaipur represents a transformation of another kind, one which is of crucial relevance to us today. For the master plan of the city attempts to combine the most ancient and sacred beliefs with the tenets of modern science.

Maharaja Jai Singh who founded the city, was also the renowned astronomer who built the five Jantar Mantars (observatories) at Delhi, Jaipur, Ujjain, Banaras, and Allahabad. In the plan of Jaipur, he generated a truly extraordinary concept. The basic plan of the city is the nine-square mandala corresponding to the Navgraha or nine planets. The void in the central square was used for the palace garden. Because of the presence of a hill, a corner



City layout of the Jaipur City

History of Jaipur

• It was rounded on 18 November 1727 by Maharaja Sawai Jai Singh ll the ruler of Amber, after whom the city has been named and the architect of the city was Vidhyadhar Bhattacharya.

• The city of Jaipur was not meant to be a fort-town or a military base, but a center for commerce and trading. The new capital was meticulously planned, keeping in mind the traditional treatise on architecture the Vastu Shastra.

• The city was planned in 9 blocks which signifies the nine planets and these blocks follow the grid pattern with roads linking the whole city.

• Although the 9th block at the northwestern part was Enhabitable because of the presence of steep hills hence that part was shifted to the southeastern area forming an asymmetrical pattern.

Layout Plan

• Following the directions of the Hindu Shilpa shastra, the width of the main streets & other lanes were fixed, Thus the main streets of the city were 111 Ft, wide, secondary roads 55 ft. wide & the smaller ones 27ft. wide, 111 is a holy number in Hinduism and 'hence considered lucky also.

• The directions of each street and market are East to West and North to South.

• The commercial shops were designed in Jaipur in multiples of nine (27) having one cross street For a planet. "Nine" signifies the nine planets of the ancient astrological zodiac, and twenty. seven signifies the 27 nakshatras.

Concept of Jawahar Kala Bhawan

• The ideology behind this cultural center is quite fascinating as the architect chose Jaipur's city plan to be constructed as a center for preserving the city's rich art and culture,

• Charles Con-ea's plan for the -Jawahar Kala Kendra' invokes directly the original navagraha or nine-house mandala. His ideology was to invoke the underlying construct of the cosmos they are meant to represent.

• In the museum, Correa's direct imitation of the Jaipur city is evident in the displacement of one of its squares from the nine-square construct to create a main entrance_ Hence on a closer examination one could suggest that Correa used the nine-square Mandela not only as a structuring device but also to consciously invoke Me symbolism of traditional city.

• The astrological symbol of each planet is directly expressed in a cut-out opening along its external wall.

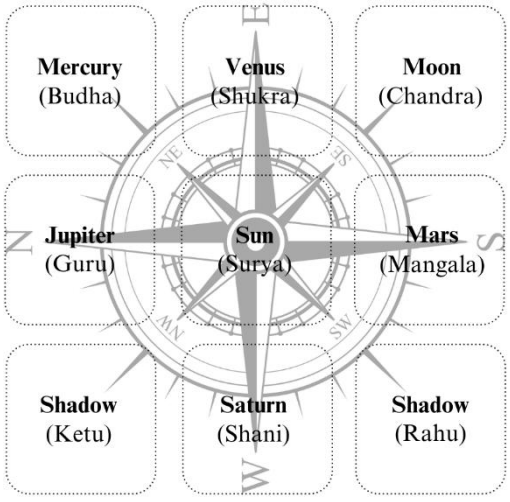
The Navagraha Planning

As we examined in the Jawahar Kala Kendra each square corresponds to a particular planet of the 'Navagraha' and the attributes of each planet have been used to dictate the functionality of each square and also the style of architectural design implemented in each of the squares. Take a few examples; the library is located at the square corresponding to the planet Mercury or Budh which has been traditionally attributed to the quality of knowledge. The theatre corresponds to the house of Venus or 'Shukra' representing the arts. The central square is a void, representing the 'Nothing which is Everything'.

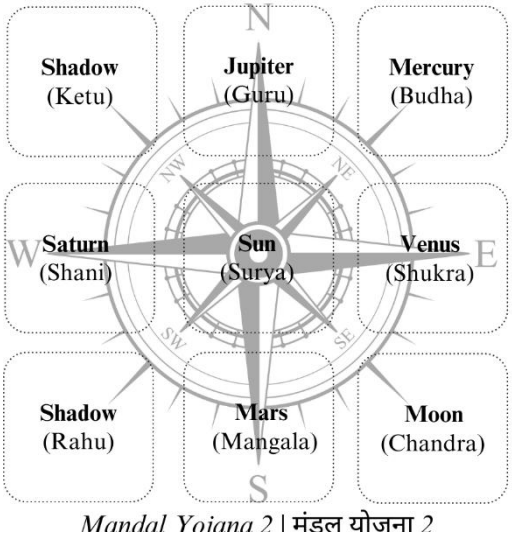
According to Navagraha planning, the layout of a city should be designed in such a way as to align with the positions of the celestial bodies at the time of its founding. This is believed to bring good fortune and prosperity to the city's inhabitants.

The placement of different structures and buildings within the city is also determined by Navagraha planning. For example, the temple should be located in the eastern part of the city, which is associated with the rising sun and new beginnings. The palace or administrative center should be located in the western part of the city, which is associated with the setting sun and endings.

2 The Navagraha Mandala
नवग्रह मंडल



Mandal Yojana 1 | मंडल योजना *1*



Mandal Yojana 2 | मंडल योजना *2*

GODS AND GODDESSES

NAVAGRAHAS - DESCRIPTION OF NAVAGRAHAS

A brief description of each of the Navagrahas is given below

RAHU

His image resembles that of Budha (Mercury) in some respects but both gods differ fundamentally in their nature and temperament. He is generally shown riding a dark lion, in contrast to the white lion of Budha. But just like the other god, he carries the same weapons, namely a sword, a javelin and a shield in his three hands, while his fourth hand is held in varadamudra.

SUKRA (VENUS)

Sukra is the teacher of the demons and the author of Sukraniti. He is generally shown with four hands, riding upon a golden or a silver chariot drawn by eight horses. Three of his hands hold a staff, a rosary, a vessel of gold respectively while the fourth one is held in varada mudra.

KETU

In Sanskrit Ketu (Dhuma ketu) means comet. The scriptures describe him as having the tail of a serpent as his body, a description which very much matches with his connection to the image of a comet. However in the images, he is usually shown with a poke marked body, riding upon a vulture and holding a mace.

BRIHASPATHI (JUPITER)

Also known as Brahmanaspati is the teacher of gods and is praised in many hymns of the Rigveda. He is generally shown with two hands, seated in a chariot driven by eight horses. The eight horses probably represent eight branches of knowledge.

SURYA(SUN)

He is the Sun god, also called Ravi. He rides a chariot that has one wheel and pulled by seven while horses. The seven horses symbolically represent the seven colors of the white light and the seven days of the week.

CHANDRA (MOON)

Also knows as Soma, and probably because of his waxing and waning qualities, in the images he is never depicted in full. We see him with only his upper body from chest upwards, with two hands holding one lotus each, riding upon a chariot drawn by 10 horses.

SANI (SATURN)

Sani is a turbulent and troublesome god who makes and breaks fortunes by his influence and position in the planetary system for which he is invariably feared and especially worshipped by those who believe in Hindu astrology. He is generally shown with four hands riding upon a chariot, or a buffalo or a vulture. In three hands he shown holding an arrow, a bow and a javelin respectively while the fourth one is held in varadamudra.

BUDHA (MERCURY)

We generally see him depicted with four hands, riding upon a chariot or a lion. Three of his hands hold a sword, a shied and a mace respectively, while the fourth one is held in the usual varada mudra (giving gesture).

MANGALA (MARS)

Also called Angaraka, Mangala is a ferocious god with four hands. In two hands he holds weapons, generally a mace and a javelin, while the other two are held in abhaya and varada mudras. He uses ram as his vehicle.

Image & Data source: www.hinduismgyan.com

The Vastu Shashtra

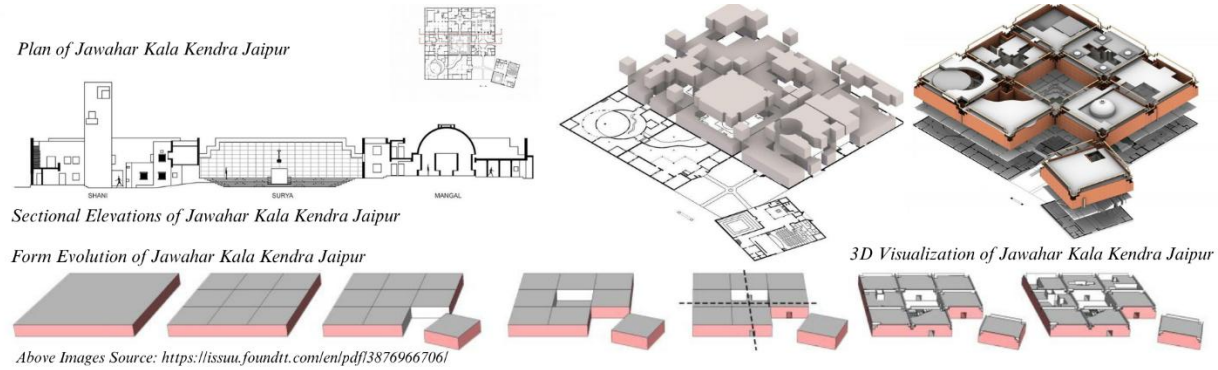
"Vāstu Vidya or the ancient Indian knowledge of architecture has its first textual reference in the Rig Veda and survives today as a continuing tradition, through its fragmentary application by astrologers, craftsmen, conservation architects, and priests" (Chakrabarti, 1998, p. 1). In the contemporary practice of architecture, this knowledge, though uninformed and fragmentary, has still found some use. The paper argues that contemporary design education does not provide the desired emphasis on traditional building philosophy, principles, and practices.

The traditional principles of design and the traditional practices of the building are both relevant and significant for architecture education. This claim may seem unfounded in the context of contemporary understanding of design, which is largely a by-product of the colonial occupation in the sub-continent and a direct descendant of modernity.

Jawahar Kala Bhavan

Correa explains that the Jawahar Kala Kendra is "a contemporary construct based on an ancient perception of the non-Manifest World, as expressed in the vastu-purush-mandalas – those sacred Vedic diagrams that have been of seminal importance for Hindu, Buddhist and Jain architecture over many centuries". (Correa, 1996, p. 28).

A maṇḍala with a central space as an absolute void or nothingness (shunya), and simultaneously a point source of all energy or everything (bindu), is a "truly mind-blowing concept", says Correa, "similar to the black holes of contemporary physics" (Cruickshank, 1987, p. 57).



Vāstu Vidya as the Basis of the Philosophy of Design

The discussion builds upon the theoretical underpinnings and practical application of the ancient concept of the vāstu puruṣa maṇḍala. According to Vastu Vidya, the fundamental aspect of the art and science of architecture is embedded in the "Spirit of the Site" – also known as vāstu (Acharya, 2010a; Dagen, 1994; Sharma, 2012). The three critical attributes of a design process are concept, rationale, and tools; these are illustrated in what is known as a vāstu maṇḍala or a grid plan.

There are thirty-two types of maṇḍalas that could be applied to a site depending on the type, scale, function, and complexity of a building. In each plan type, a specific place is assigned to the presiding deity who in turn dictates the function or use of that space in a building. This approach is applicable to both sacred and secular architecture.

The first is a site of one plot and is named Sakala. A plot could be square, rectangle, oval, polygonal, or circular. A site of four plots is named Paiśācha, of nine plots is named Pīṭha, of sixteen plots is named Mahāpīṭha, of twenty-five plots is named Upapīṭha and so forth.

The principle of generating plots is:

sx = p(x^2)

'sx' is the site nomenclature

'p' is the number of plots in that particular site type

For example

s1 = p(1^2) = p = 1 plot (Sakala)

s2 = p(2^2) = 4p = 4 plots (Paiśācha or Pechaka)

s3 = p(3^2) = 9p = 9 plots (Pīṭha)

s4 = p(4^2) = 16p = 16 plots (Mahāpīṭha)

s5 = p(5^2) = 25p = 25 plots (Upapīṭha)

This classification of sites is prescribed until the thirty-second type which has one thousand and twenty-four plots and is named Chandra-kānta.

s32 = p(32^2) = 1024p = 1024 plots (Chandra-kānta)

It is informative to understand the evolution of vāstu maṇḍalas or ground plans for the various types of sites and buildings. Each plan is recommended for a specific function and building type.

15.2 DESIGN DETAIL

1. Facts about each Designed Block

- Area of One Block: **1 Acre**
- Area of one Community: **0.084 Acres**
- Total no. of Communities: **8**
- Open Space: **1 Central Plot**
- **Design Principle: The Navagraha Planning System**

The Navagraha planning system has played a significant role in the design and organization of the Kumbh Mela, one of the largest religious gatherings in the world. The Kumbh Mela is held every 12 years at four different locations in India, including Allahabad (Prayagraj), which is known for its use of Navagraha planning.

The layout of the Kumbh Mela site in Prayagraj is designed to align with the positions of the Navagrahas, or celestial bodies, at the time of the festival. The central area of the festival, where the various sects of sadhus reside, is called the akharas, and it is located in the eastern part of the festival site, in alignment with the rising sun and the direction associated with new beginnings.

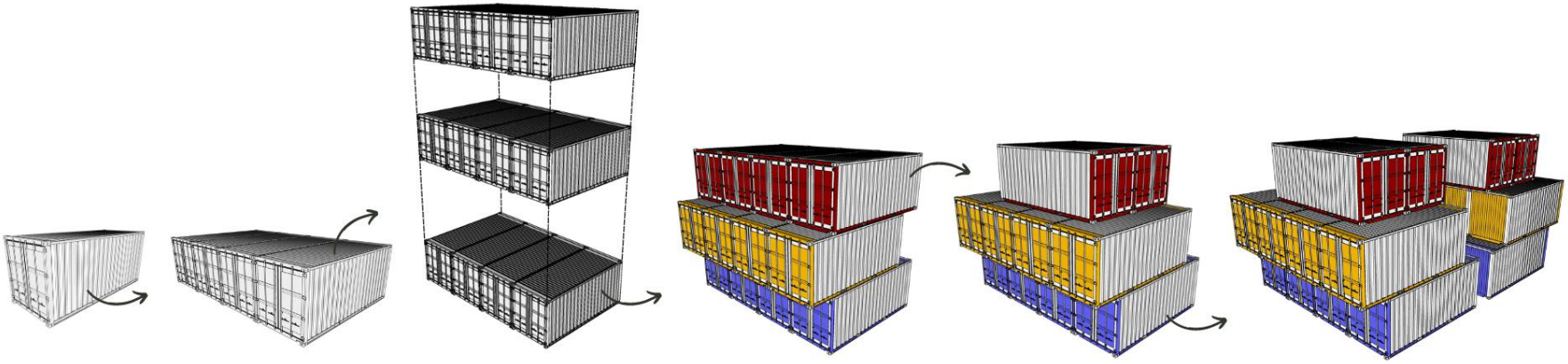
The western part of the festival site is associated with the setting sun and endings, and it is where administrative offices and other structures are located. The placement of other structures and facilities within the festival site is also determined by Navagraha planning, taking into account the directional relationships between the celestial bodies and their corresponding elements.

The use of Navagraha planning in the design of the Kumbh Mela site reflects the importance of astrology and celestial bodies in traditional Indian culture. It also demonstrates the ongoing influence of traditional planning principles in modern urban design and planning, particularly in the design of large-scale events and gatherings such as the Kumbh Mela.

In the context of the Kumbh Mela, the Navagraha Planning System is used to assign different sectors and blocks to specific groups of pilgrims based on their zodiac signs. This helps to create a more harmonious and balanced environment, as well as to facilitate the movement of people and reduce congestion in certain areas.

Each sector and block is assigned a specific Navagraha, and pilgrims are directed to these areas based on their zodiac sign. This system helps to distribute the crowd evenly across the festival grounds and reduces the risk of overcrowding and safety hazards.

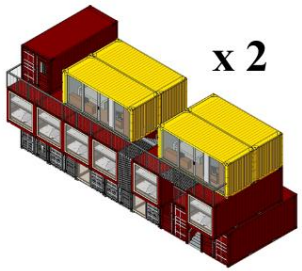
The Navagraha Planning System also has cultural and spiritual significance for many pilgrims, as it is believed to have a positive influence on their well-being and spiritual growth. It reflects the deep connection between astrology, spirituality, and the natural world that is an integral part of Indian culture.



Single Container | Four Containers Together | Stacking them over each other | Colour Coding for Differentiation | Trying the best Placements | Development of Single Community

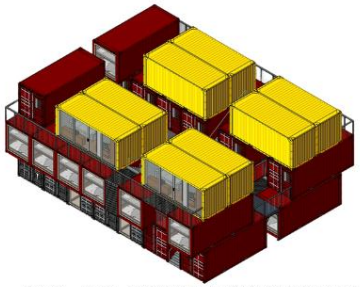
x 36

IN ONE COMMUNITY



x 2

PARTS OF A COMMUNITY

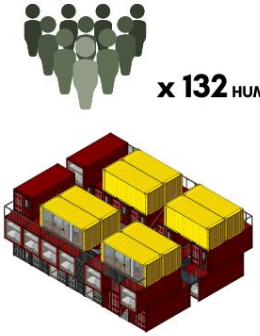


x 8

NO. OF COMMUNITIES IN 1 BLOCK

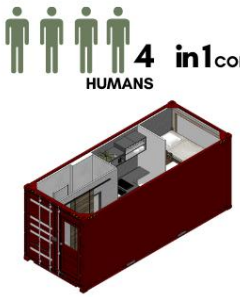
x 37

NO. OF BLOCKS IN THE SETTLEMENT DESIGNED



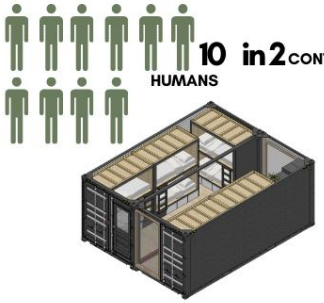
x 132 HUMANS

TOTAL NO. OF PEOPLE HOUSED IN ONE COMMUNITY



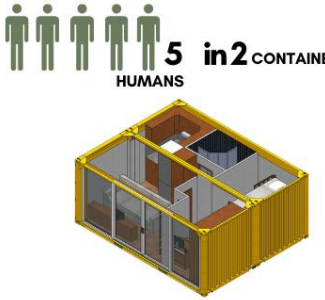
4 HUMANS in 1 CONTAINER

TOTAL NO. OF SIMIAR TYPE : 9
TOTAL NO. OF PEOPLE HOUSED : 36



10 HUMANS in 2 CONTAINERS

TOTAL NO. OF SIMIAR TYPE : 2
TOTAL NO. OF PEOPLE HOUSED : 20



5 HUMANS in 2 CONTAINERS

TOTAL NO. OF SIMIAR TYPE : 2
TOTAL NO. OF PEOPLE HOUSED : 10

COMMUNITY TOILET

x 16 TOILETS

TOTAL NO. OF TOILETS : 2
PEOPLE USING : 20-40

2. Block Design Detail

Block design is a crucial aspect of the spatial organization of the Kumbh Mela. The entire festival site is divided into several blocks and sub-blocks, each with its own facilities and amenities to cater to the millions of pilgrims who attend the festival.

The blocks are designed to be self-sufficient units, with their own water points, toilets, and showers. The blocks are further divided into sub-blocks, which are assigned to different groups of pilgrims, such as families or religious organizations. The sub-blocks contain temporary campsites, food stalls, and other amenities. The block design is intended to facilitate the management of the festival, making it easier for organizers to control the movement of people and ensure that everyone has access to the necessary facilities and services.

The block design also helps to maintain order and prevent overcrowding, which is a significant concern at the Kumbh Mela due to the massive influx of pilgrims. The use of block design is a practical and efficient solution to the challenges of organizing such a large-scale event, allowing for effective crowd management and the provision of essential services and facilities. Size and capacity: Each block in the Kumbh Mela is designed to accommodate a certain number of people, depending on the location and the availability of space. The size and capacity of each block are carefully planned to ensure that there is enough room for everyone, without overcrowding or creating safety hazards.

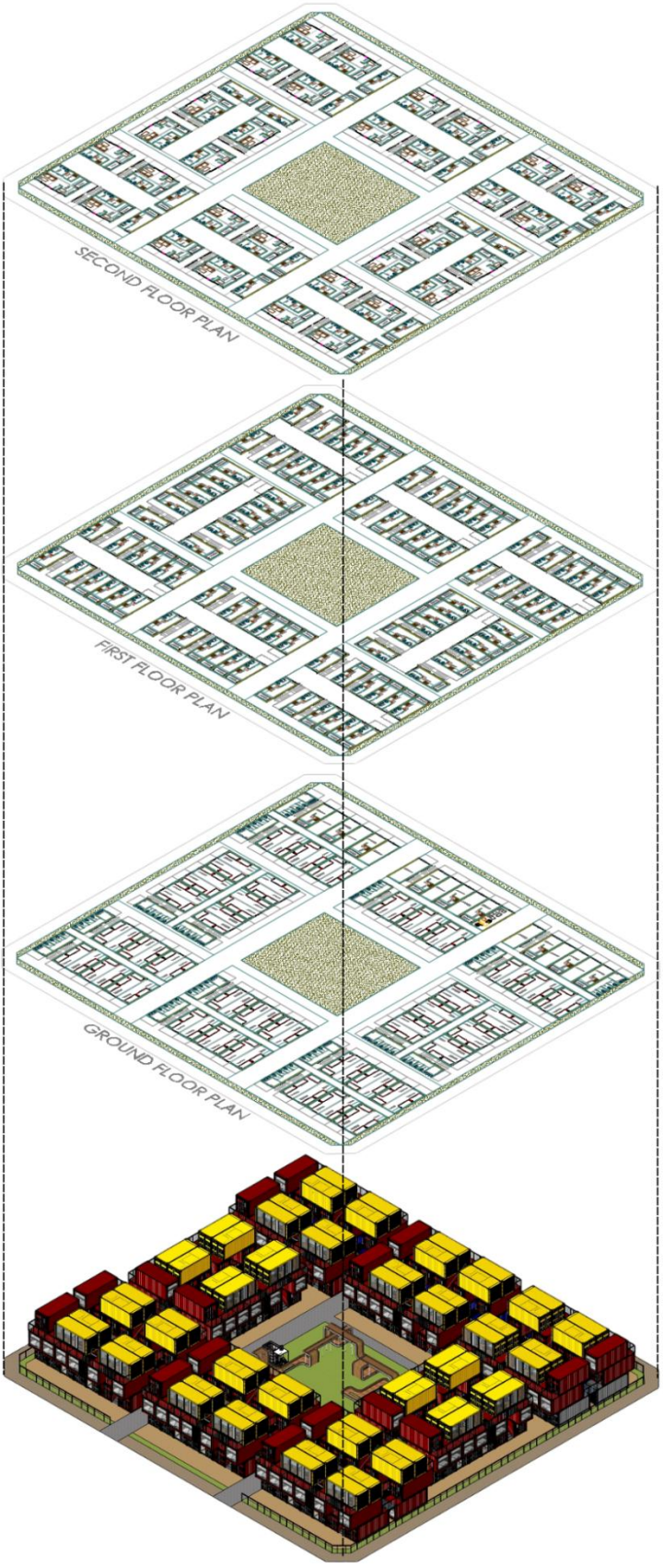
Layout and orientation: The layout and orientation of each block are also designed to maximize space and minimize congestion. The blocks are arranged in a grid pattern, with wide pathways for pedestrian traffic and designated areas for vehicles and emergency services.

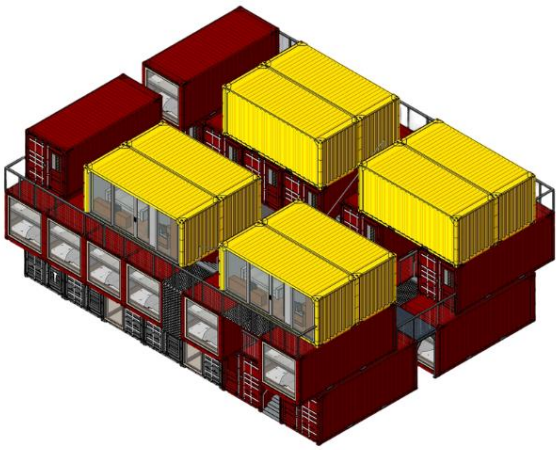
Facilities and amenities: Each block has its own set of facilities and amenities, including toilets, showers, water points, and garbage disposal units. These facilities are designed to meet the basic needs of the pilgrims and ensure that they have a safe and comfortable experience at the festival.

Security and safety: The block design also helps to improve security and safety at the Kumbh Mela. Each block has its own entry and exit points, which are manned by security personnel to prevent unauthorized access and maintain order. The block design also allows for easy identification of lost or missing persons, making it easier for organizers to reunite them with their families.

Cultural and religious considerations: The block design of the Kumbh Mela also takes into account cultural and religious considerations. For example, certain blocks may be designated for specific religious groups or sects, while others may be reserved for families or women. This helps to create a more inclusive and respectful environment for all pilgrims, regardless of their background or beliefs.

Overall, the block design in the Kumbh Mela is a critical aspect of the festival's organization and management. It helps to facilitate the movement of people, provide essential services and amenities, improve security and safety, and create a more inclusive and respectful environment for all pilgrims.

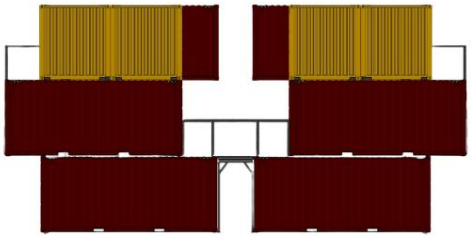




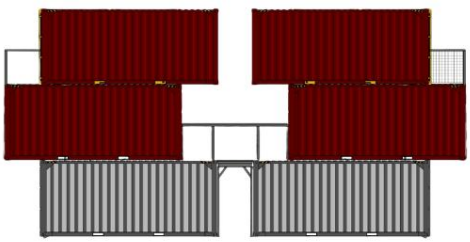
ONE COMMUNITY OF A BLOCK

FRONT ELEVATION OF A BLOCK

REAR ELEVATION OF A BLOCK



RIGHT ELEVATION OF A BLOCK



LEFT ELEVATION OF A BLOCK

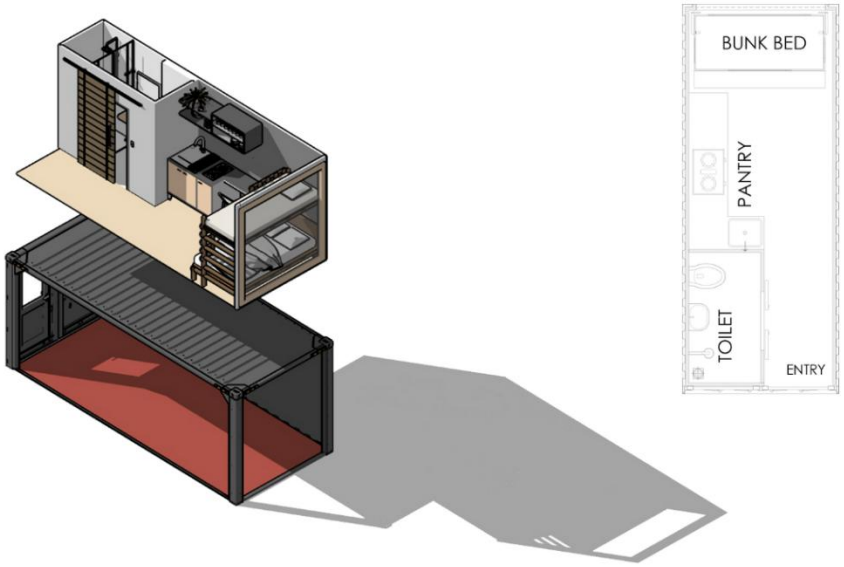
SECOND FLOOR PLAN | दूसरी मंजिल योजना

FIRST FLOOR PLAN | पहली मंजिल योजना

GROUND FLOOR PLAN | भूतल योजना

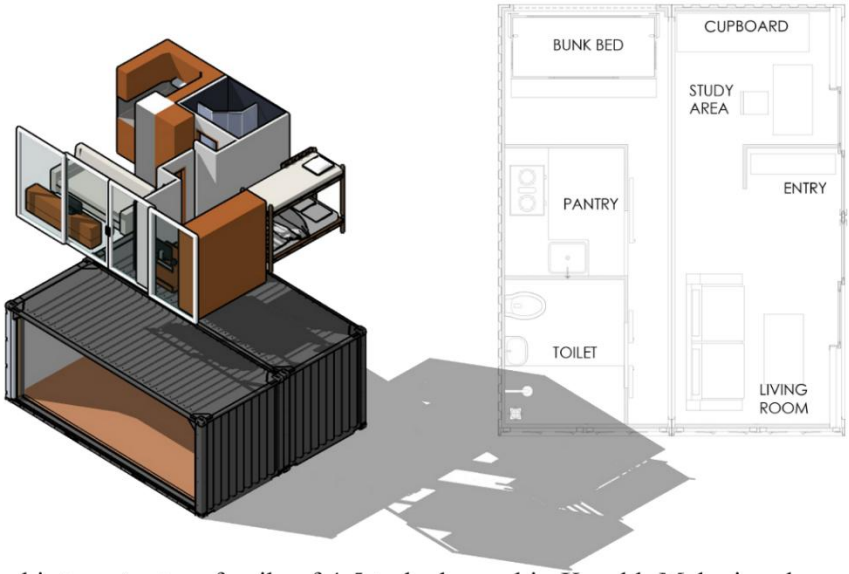
3. Typologies of Building in each Block

Typology 1 - Single Family Basic Occupancy



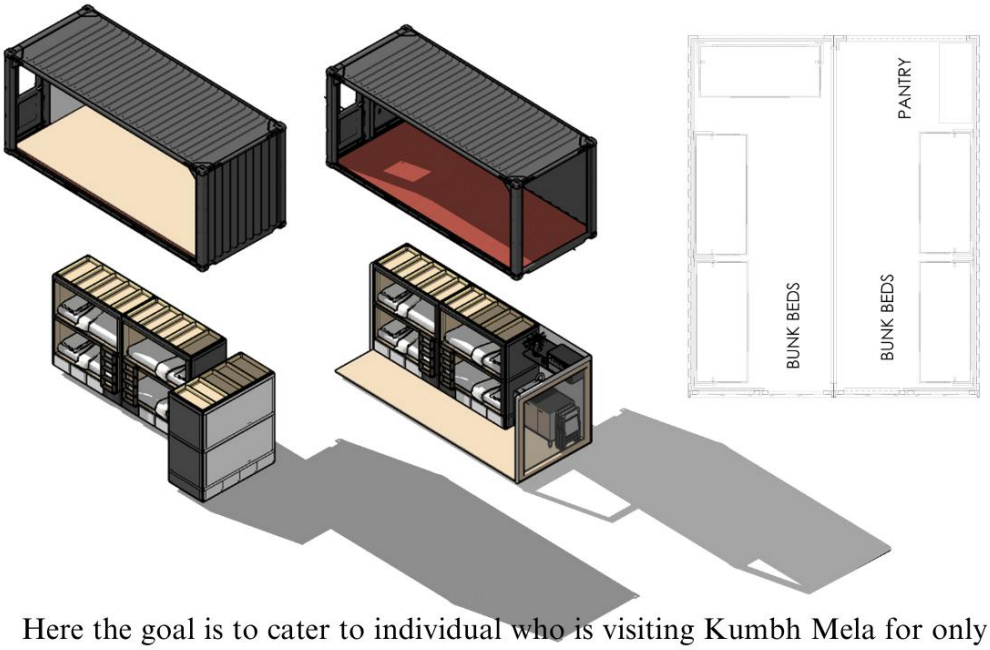
Here the goal is to cater to a family of 4-5 to be housed in Kumbh Mela, where an attached washroom, a well-equipped temporary pantry and bunk beds with the possibility of a bottom slide are provided

Typology 2 - Single Family Deluxe Occupancy



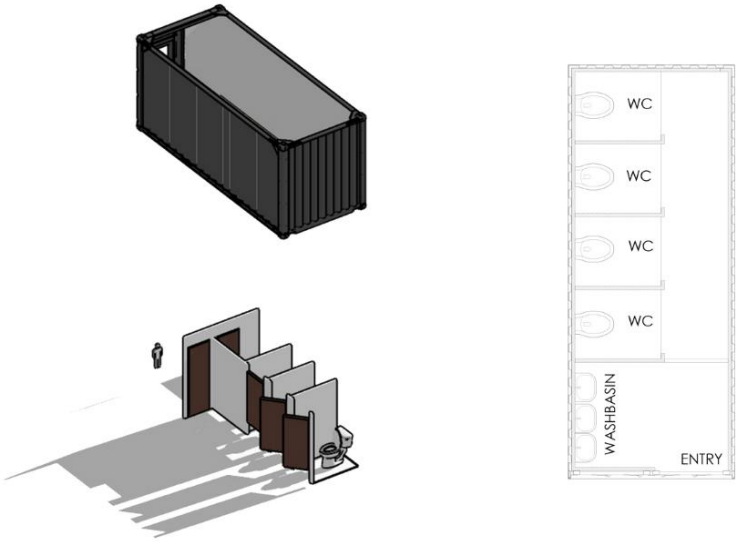
Here the goal is to cater to a family of 4-5 to be housed in Kumbh Mela, in a luxury manner, where an attached washroom, a well-equipped kitchen, living area, study area, storage cabinets and bunk beds with the possibility of a bottom slide are provided

Typology 3 - Dormitory Occupancy



Here the goal is to cater to individual who is visiting Kumbh Mela for only a certain period or day of the month and is needed to be housed in a juncture, it provides separate sleeping beds with storage cabinets on the bottom, and each housing comes along with two shipping containers where a total of 10 people can be provided accommodation on a temporary basis., this also comes along with a temporary pantry area, central open living and common outdoor washrooms, separate for ladies and gents.

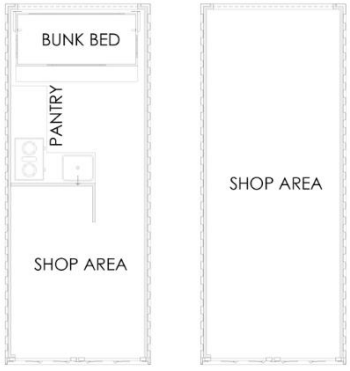
Typology 4 - Washroom Containers



Here the goal is to provide safe and hygienic washrooms to every individual visiting the Kumbh Mela, Bothe Gens & Ladies have separate washrooms with four separate WCs, and two to three washbasins.

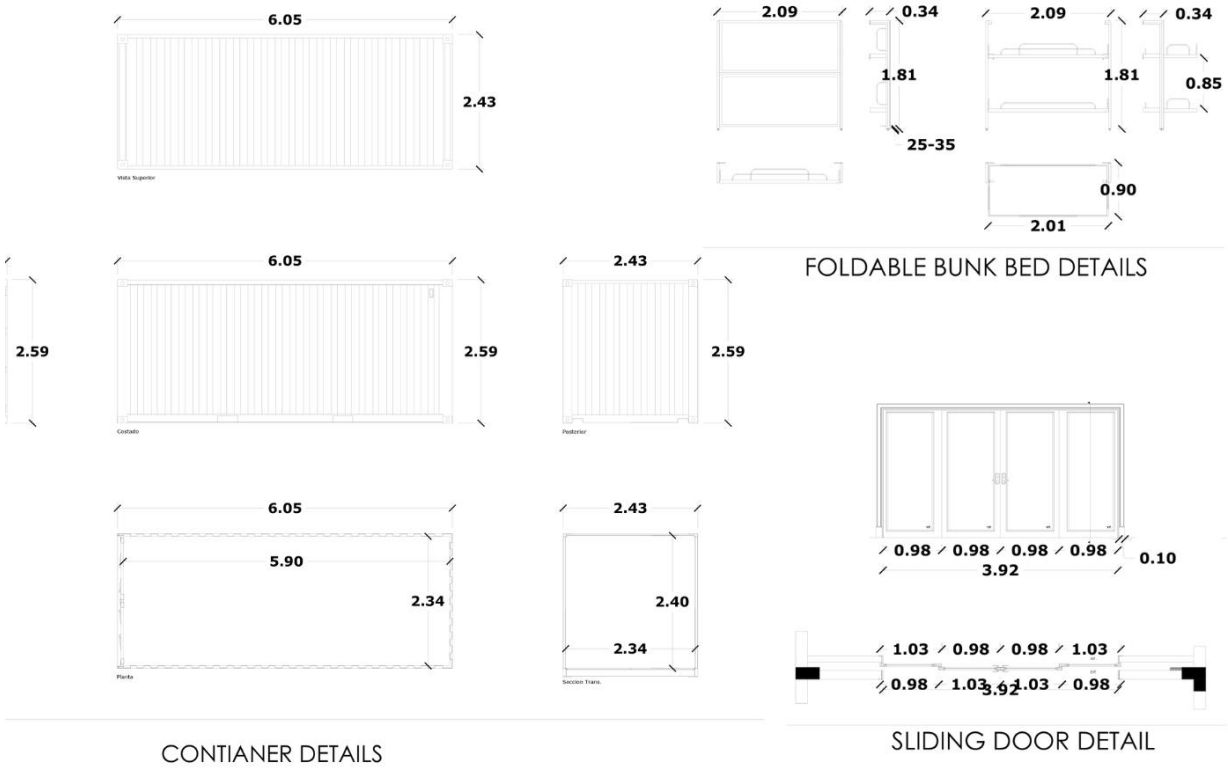
Typology 5 - Shop Containers

Here the goal is to provide Shops in a container with open space, I have planned two typologies of shops here, Plan-A is a shop with a Bed & Pantry which gives half of the space for each, whereas, Plan-B has open shop area possibility, which can be used for various purposes, it has wide open window on the rare end.



SHOP PLAN-A SHOP PLAN-B

Typical Container Details

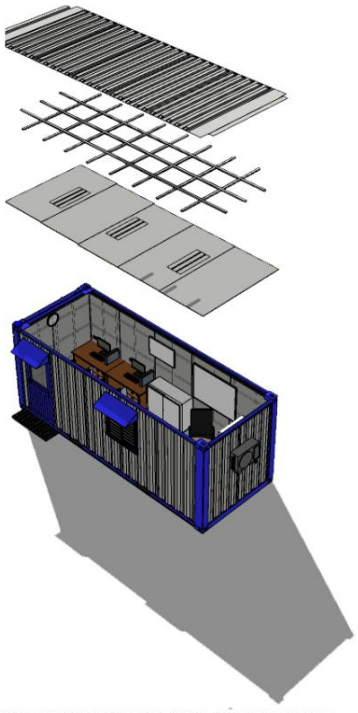


CONTIANER DETAILS

FOLDABLE BUNK BED DETAILS

SLIDING DOOR DETAIL

Typology 6- Working Office Container Building



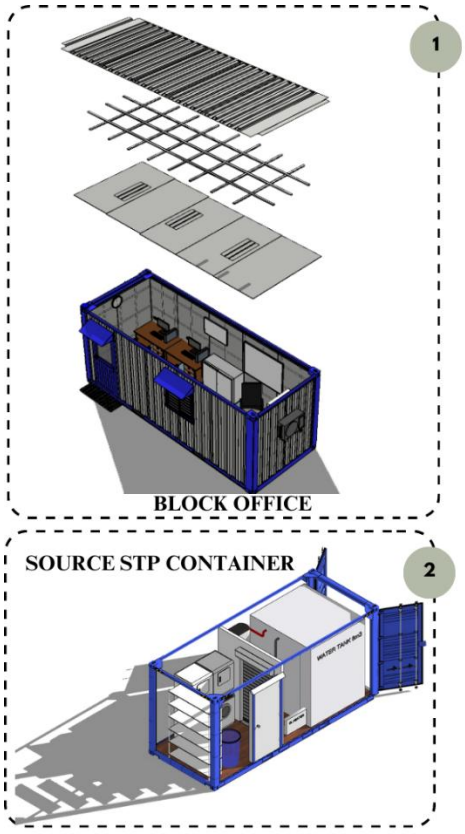
BLOCK OFFICE EXPLODED VIEW

Here the goal is to cater to individual who is visiting Kumbh Mela for only a certain period or day of the month and is needed to be housed in a juncture, it provides separate sleeping beds with storage cabinets on the bottom, and each housing comes along with two shipping containers where a total of 10 people can be provided accommodation on a temporary basis., this also comes along with a temporary pantry area, central open living and common outdoor washrooms, separate for ladies and gents.

BLOCK OFFICE PLAN

4. Amenities planned in a Community in each Block

Each block has a total of eight communities and each community has one gents and one ladies shared washroom, a central office for each block, and an STP plant to treat the waste at the source itself and improvise health & hygiene, then the treated water is transferred through pipes to the central STP for final filtration of the grey water and soil waste.



In the Kumbh Mela, each block is assigned specific amenities and facilities to cater to the needs of the pilgrims. Some of the key amenities that are planned for each block include:

Toilets and Bathrooms: Adequate number of toilets and bathrooms are installed in each block to cater to the basic sanitation needs of the pilgrims. These facilities are designed to be gender-specific and equipped with proper water supply and waste disposal systems.

Water Points: Access to clean drinking water is essential in a mass gathering like the Kumbh Mela. Hence, several water points are installed in each block to provide easy access to clean drinking water.

Medical Facilities: Medical facilities are set up in each block to provide first aid and emergency medical assistance to the pilgrims. These facilities are staffed with trained medical professionals and equipped with basic medical equipment.

Food Stalls: A variety of food stalls are set up in each block to cater to the dietary needs of the pilgrims. These stalls offer vegetarian and non-vegetarian food options and are designed to maintain hygiene and quality standards.

Security: Adequate security measures are put in place in each block to ensure the safety and security of the pilgrims. Security personnel are deployed at the entry and exit points and patrol the blocks to prevent any untoward incidents.

Waste Management: Proper waste management is essential in a mass gathering like the Kumbh Mela. Hence, separate waste collection and disposal systems are set up in each block to maintain cleanliness and hygiene.

Overall, these amenities are essential in ensuring a smooth and hassle-free experience of the pilgrims during the Kumbh Mela. The proper planning and management of these amenities contribute significantly to the success of the festival.

5. Structural benefits of a Container

Structural benefits of shipping container homes for Kumbh Mela:

- **Structural stability**: Shipping containers are designed to withstand heavy loads and harsh conditions, providing stability for temporary housing.
- **Resistance to natural disasters**: Shipping containers made of steel are resilient and can withstand extreme weather conditions, making them suitable for regions prone to natural disasters.
- **Modularity and versatility**: Shipping containers are modular and can be easily configured to create various housing structures.
- **Speed of construction**: Shipping container homes can be quickly assembled, reducing construction time compared to traditional methods.
- **Cost-effectiveness**: Shipping containers are often cost-effective, and their reuse can reduce construction costs.
- **Transportation and logistic**s: Shipping containers are designed for transportation, simplifying logistics and transportation challenges.

Note: Proper engineering, design, and compliance with local regulations are essential for the safe and effective use of shipping container homes during the Kumbh Mela or any other event.

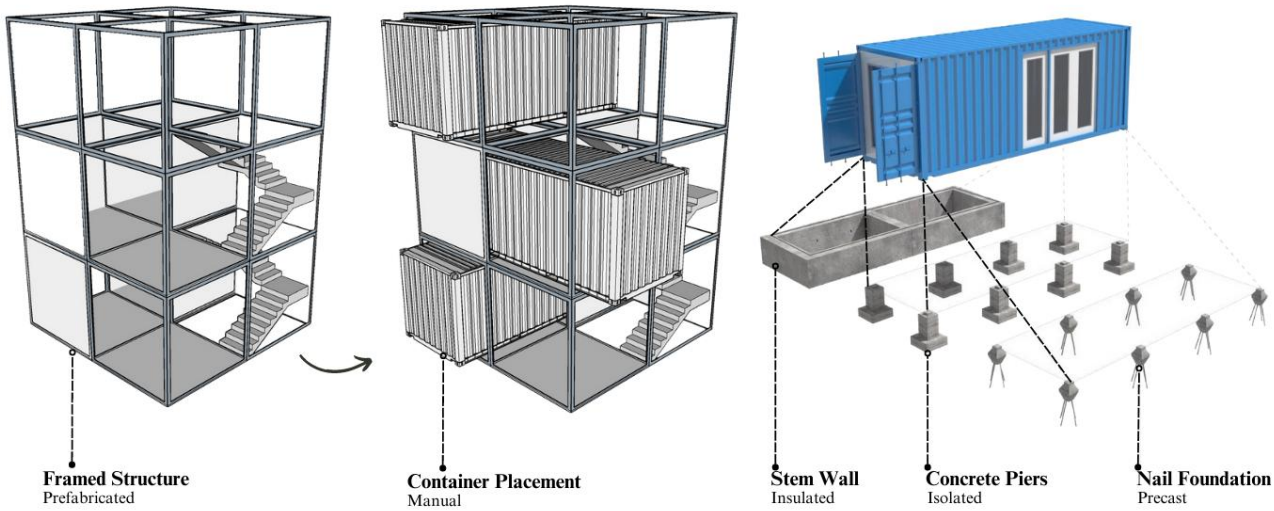
6. Why Shipping Container?

Shipping container homes can be a good solution for temporary housing during events like the Kumbh Mela, which is a major pilgrimage festival in India where millions of people gather for a holy bath in sacred rivers. Here's why:

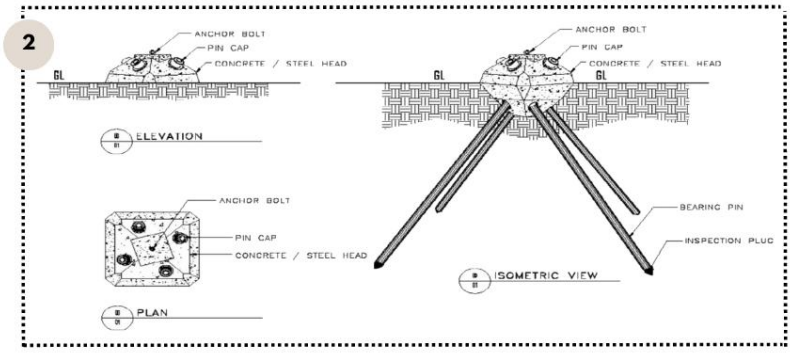
- **Rapid deployment**: Shipping container homes can be quickly transported and set up to provide immediate housing during the Kumbh Mela.
- **Cost-effective**: Repurposed shipping containers can save on material costs and streamline construction, making them a budget-friendly option for temporary housing.
- **Sustainability**: Many shipping container homes are designed with eco-friendly features like energy-efficient insulation and solar panels, reducing environmental impact.
- **Durability and mobilit**y: Shipping containers are designed to withstand harsh conditions and can be easily transported to different locations within the event site or elsewhere.
- **Customization**: Shipping containers offer design flexibility for creating functional living spaces with basic amenities like beds, toilets, showers, and ventilation.
- **Scalability**: Shipping container homes can be easily scaled up or down to accommodate varying numbers of people, providing flexibility in adjusting housing capacity based on demand.

7. Structural System Planned

- When looking at the building and dismantling of the city, it is exciting to consider that perhaps architecture has to include the anticipation of many temporalities in its imagination. Architects and planners should take into account the accommodating of change as a proactive dimension in the construction of space in both single structures and master plans.
- Considering that, I went for a collaborative learning and discussion round with a start-up currently incubated at TBI NITC, to discuss the possibilities of temporary sub-structure design and to my surprise, they had the exact similar thought of a foundation that I was looking for, as shown in image 1, 2 & 3

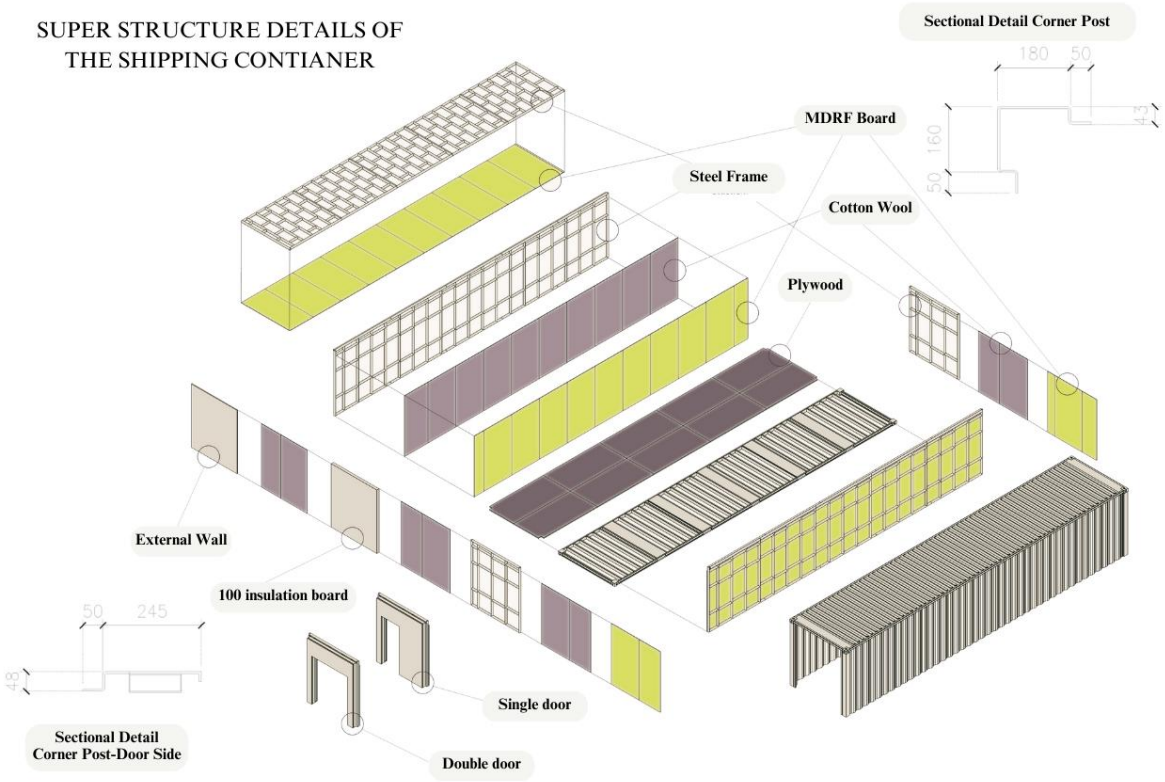


STRUCTURAL DETAILS OF NAIL FOUNDATION



DESIGN DETAILS OF THE NAIL FOUNDATION

SUPER STRUCTURE DETAILS OF THE SHIPPING CONTIANER



8. *Structural System Testing*

The below picture are showcasing, the installation steps for the temporary prefabricated cold form structure, the frame nearly similar to that of a shipping container, to the left is the working drawing details of the nail foundation, image 3 is from our testing lab at NITC. The system has been developed with TBI-NITC structural experts from the field.

STEPS OF CONSTRUCTION

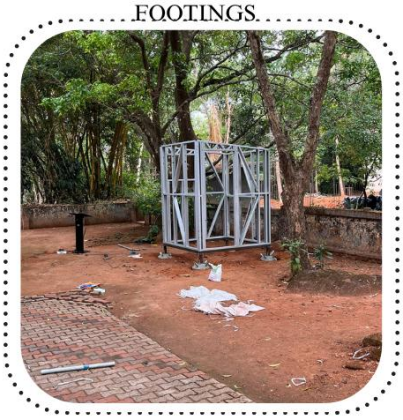
PREPARATION & PLANNING

CASTING OF THE FOUNDATION AT TBI-NITC

USING THE TIE-BEAM TO JOIN THE ISOLATED NAIL FOOTINGS

DEVELOPEMENT OF SIDE FRAME FOR STRCUTURE

ADJOINING OF THE DEVELOPED FRAMES



DEVELOPEMENT OF SIDE FRAME FOR STRCUTURE

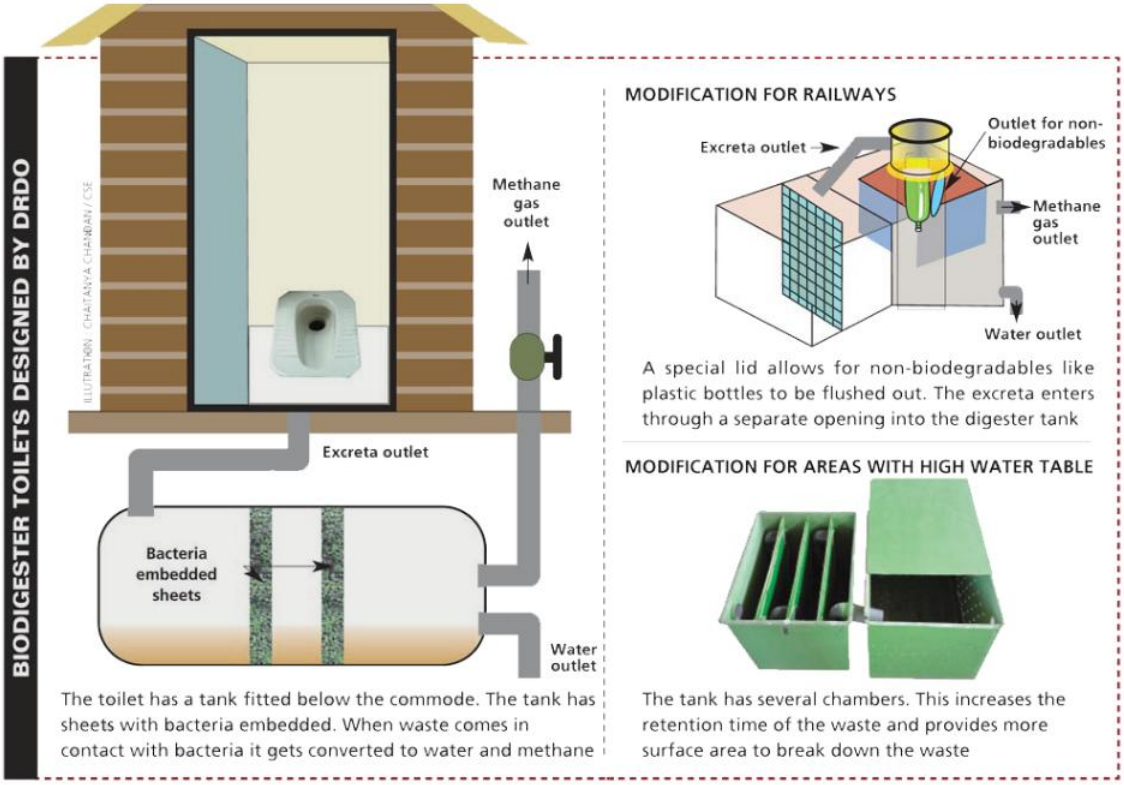
NAIL FOUNDATION ON THE DAY OF TESTING

COMPLETED COLD-FORM STRCUTURE

9. Services Planned

Aside from the technical refinement that has already been highlighted in this study, I have also worked on Solid Waste Management Solutions, along with smart STPs and in-house waste disposal solutions. In one of the quality discussions with a panel interested in pre-fab, I met a retired officer from Indian Railways who guided me about the immense available resource of Bio-Toilets with all the headquarters of IRCTC, explained in the image below

The above images are from Indian Railways Washroom & the system installed

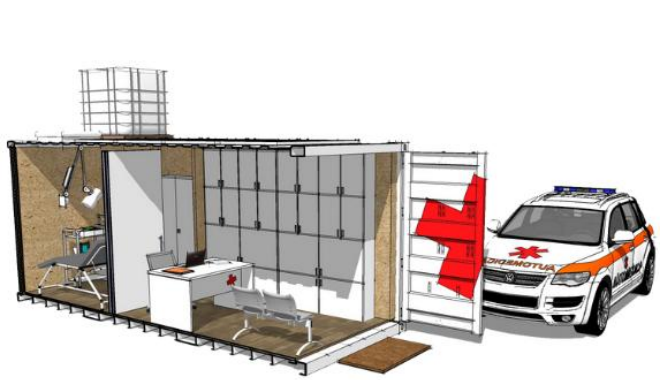


10. Amenities planned for the Kumbh Mela

Kumbh Mela is one of the largest religious gatherings in the world, and as such, it requires careful planning to ensure the safety and comfort of the millions of pilgrims who attend. Here are some amenities that could be planned for Kumbh Mela:

- **Accommodation**: One of the most important amenities to be planned for Kumbh Mela is accommodation. Temporary accommodation facilities such as tents, temporary shelters, and Dharamshalas should be set up to provide a safe and comfortable place for pilgrims to stay.
- **Sanitation**: Proper sanitation facilities such as toilets and showers must be planned and installed throughout the Kumbh Mela site to prevent the spread of diseases.
- **Medical facilities**: Medical facilities including hospitals, clinics, and ambulances should be stationed at various locations in the Kumbh Mela site to provide immediate medical assistance to those in need.
- **Food and water**: The provision of safe drinking water and hygienic food is essential. Adequate arrangements should be made for clean drinking water, as well as for food stalls and kitchens.
- **Transportation**: Appropriate transportation arrangements must be made to facilitate the movement of people within the Kumbh Mela site and to nearby areas.
- **Security**: Adequate security measures such as CCTV cameras, metal detectors, and security personnel must be put in place to ensure the safety of the pilgrims.
- **Communication**: The provision of public address systems, display boards, and information kiosks is crucial to disseminate information and important messages to the pilgrims.
- **Waste management**: Proper arrangements for waste disposal must be made to prevent littering and to maintain the cleanliness of the Kumbh Mela site.
- **Disaster management**: Adequate measures should be taken to manage any unforeseen natural disasters or emergencies.
- **Cultural activities**: Various cultural activities should be planned to showcase the rich cultural heritage of the host city and the country, providing an opportunity for pilgrims to engage with local traditions and arts.

Here the goal is to cater to individual who is visiting Kumbh Mela for only a certain period or day of the month and is needed to be housed in a juncture, it provides separate sleeping beds with storage cabinets on the bottom, and each housing comes along with two shipping containers where a total.

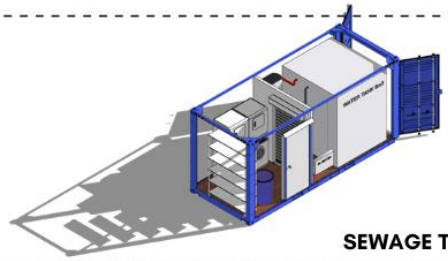


FIRST AID POINTS

ATM

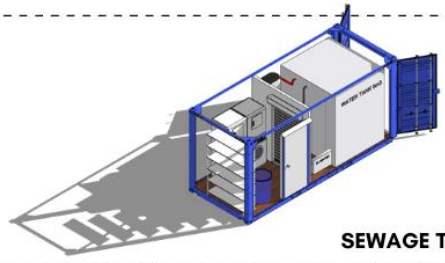
BUS STAND

CAR CARE

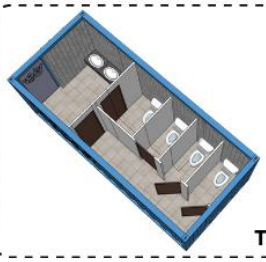


SEWAGE TREATMENT PLANT

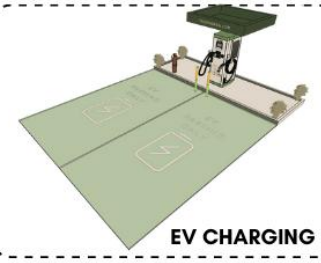
CAR CARE



SEWAGE TREATMENT PLANT

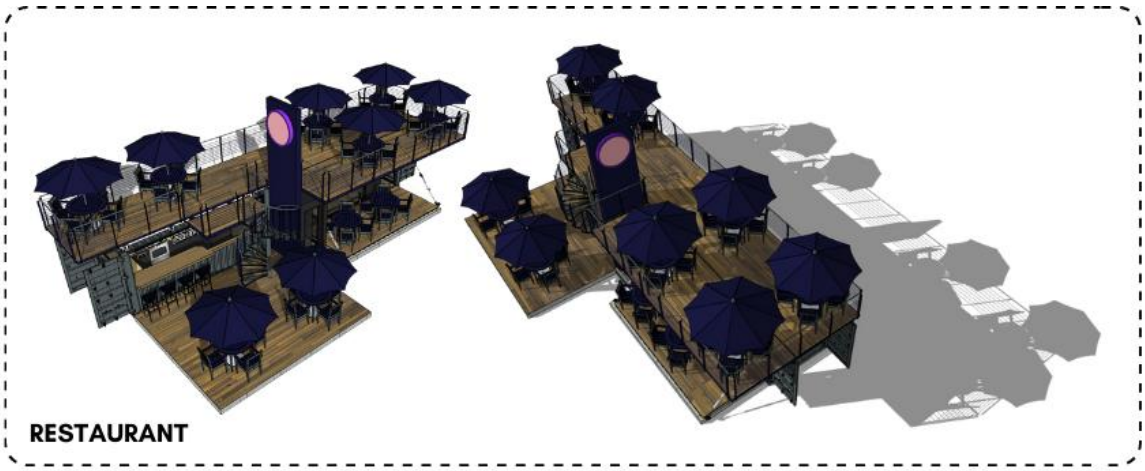


TOILET

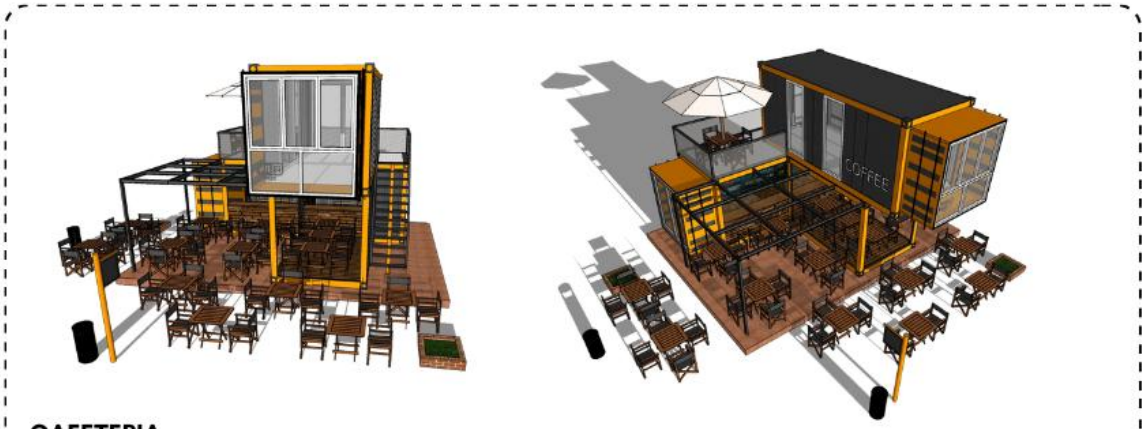


EV CHARGING

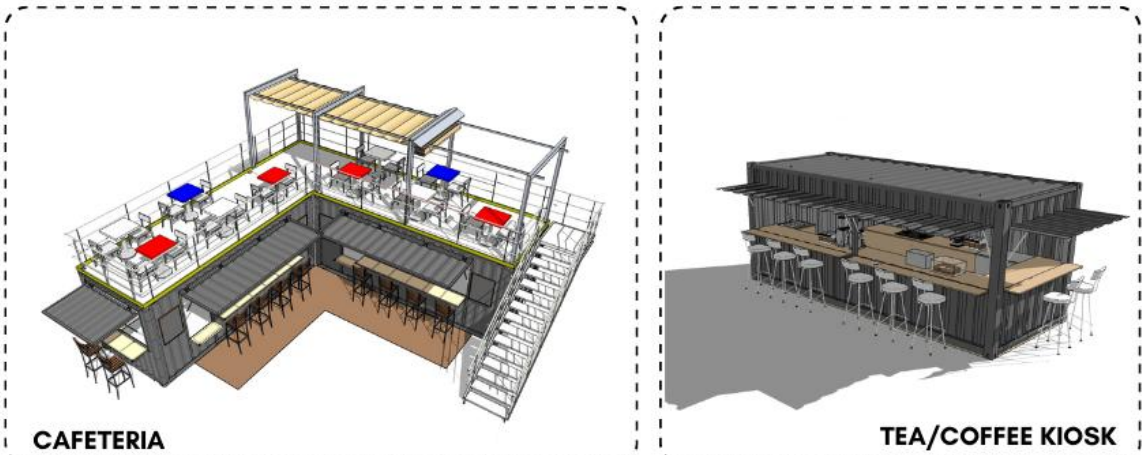
KIOSK



RESTAURANT



CAFETERIA



CAFETERIA

TEA/COFFEE KIOSK

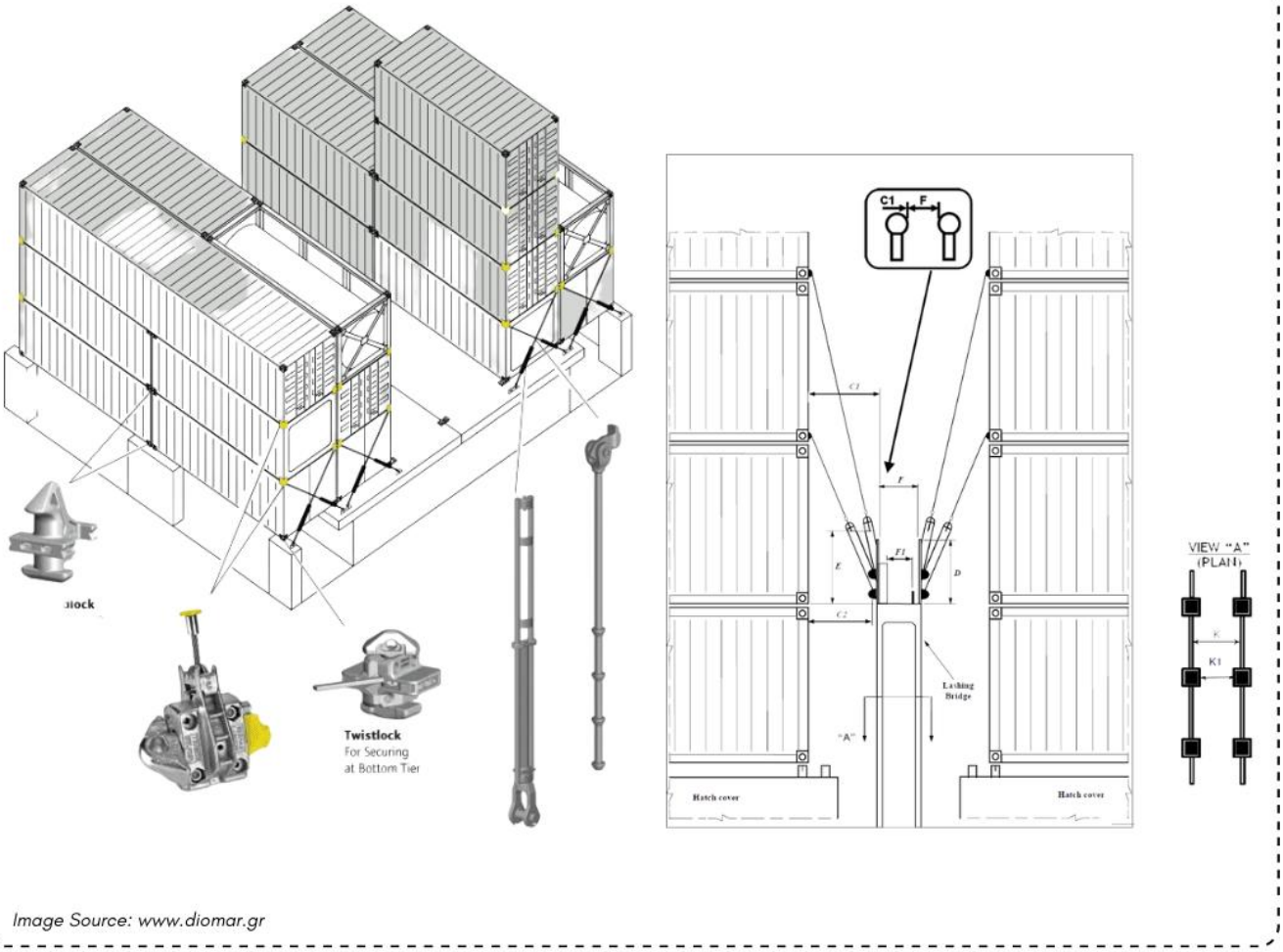


Image Source: www.diomar.gr

15.3 MASTER PLAN DEVELOPMENT

The master plan for the Kumbh Mela involves the development of a comprehensive framework that guides the overall planning and management of the festival. The plan encompasses all aspects of the festival, including site layout, infrastructure development, crowd management, security, and waste management. Some key considerations that are taken into account during the development of the master plan for the Kumbh Mela are:

Site Selection: The selection of the festival site is crucial in ensuring the smooth and hassle-free organization of the festival. Factors such as accessibility, availability of resources, and the suitability of the site are taken into consideration while selecting the site.

Infrastructure Development: The development of adequate infrastructure is necessary to ensure the smooth functioning of the festival. The infrastructure includes roads, electricity, water supply, sanitation facilities, medical facilities, and communication facilities.

Crowd Management: The management of the large crowds that attend the Kumbh Mela is one of the critical aspects of the festival. The crowd management plan involves the development of systems and protocols to manage the entry and exit of people, maintain order, and ensure the safety of the pilgrims.

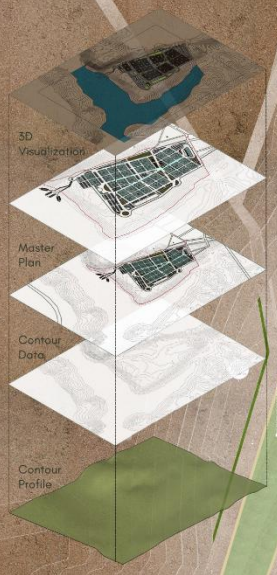
Security: The security of the pilgrims attending the Kumbh Mela is of utmost importance. The security plan involves the deployment of security personnel, the installation of surveillance systems, and the development of emergency response systems.

Waste Management: The Kumbh Mela generates a massive amount of waste, and proper waste management is essential to maintain cleanliness and hygiene. The waste management plan involves the development of systems to collect, segregate, and dispose of the waste generated during the festival.

The master plan for the Kumbh Mela is developed with the objective of ensuring the smooth organization and management of the festival. The plan is regularly reviewed and updated to ensure that it remains relevant and effective in meeting the changing needs of the festival.

PROPOSED MASTER PLAN SECTOR 1 & 2-KUMBH MELA 2025
प्रस्तावित मास्टर प्लान-सेक्टर 1 और 2-कुंभ मेला 2025

Reimagining the Urban River Profile of Triveni Sangam at Prayagraj
#Impermanence is the new permanence



Central Bus Terminal
सेंट्रल बस टर्मिनल

Mega Car Parking
मेगा कार पार्किंग

Typical Residential Block
ठेठ आवासीय ब्लॉक

Shri Bade Hanuman ji Temple | श्री बड़े हनुमान जी मंदिर

Primary Health Care Center
प्राथमिक स्वास्थ्य केंद्र

Sector Office-S1
सेक्टर कार्यालय-एस1

Bus Stop- Hanuman Mandir
बस स्टॉप- हनुमान मंदिर

Vending Zone & Food Court
वेंडिंग जोन और फूड कोर्ट

Petrol Pump
पेट्रोल पंप

Fire Station
अग्निशमन केंद्र

Central Police Station
केंद्रीय पुलिस थाना

Sector Office-S2
सेक्टर कार्यालय-एस2

Lost & Found Office
खोया और पाया कार्यालय

Central Kumbh Control Office
केंद्रीय कुंभ नियंत्रण कार्यालय

Open Pavilion Space
ओपन पवेलियन स्पेस

Vending & Changing Containers
वेंडिंग और बदलते कंटेनर

Housing for EWS Section
ईडब्ल्यूएस अनुभाग के लिए आ

Bus Stop-Sangam View M
बस स्टॉप-संगम पॉइंट

Bus Stop- Triveni Sanga
बस स्टॉप- त्रिवेणी संगम

Sangam Boat Club
संगम बोट क्लब

VIP Residences
वीआईपी निवास

Boat Boarding Afloat | बोट बोर्डिंग अफ्लोट

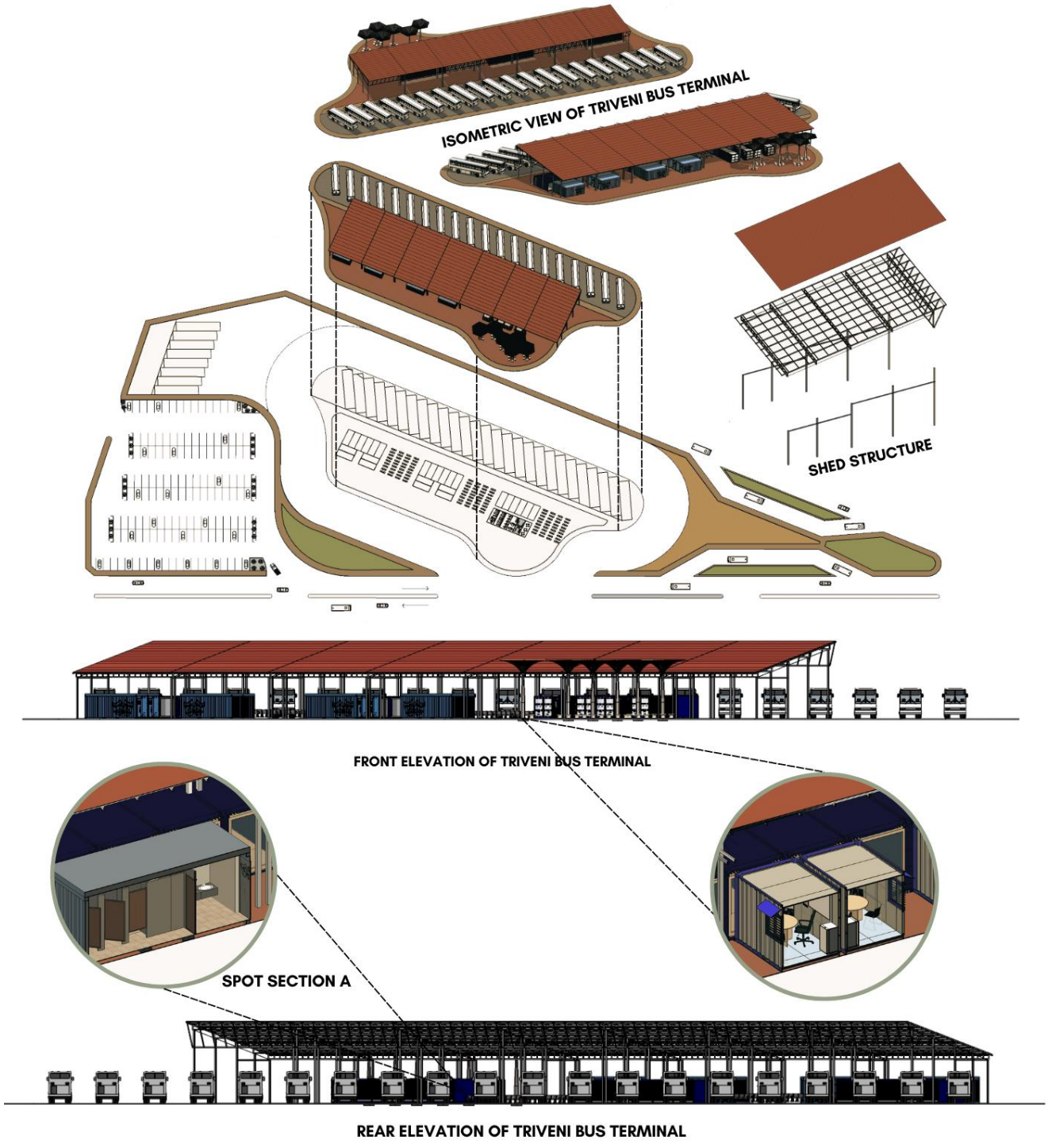
Snan Ghats | स्नान घाट

NDRF Team office & Residence + PHC-S2
एनडीआरएफ टीम कार्यालय और निवास + पीएचसी-एस2

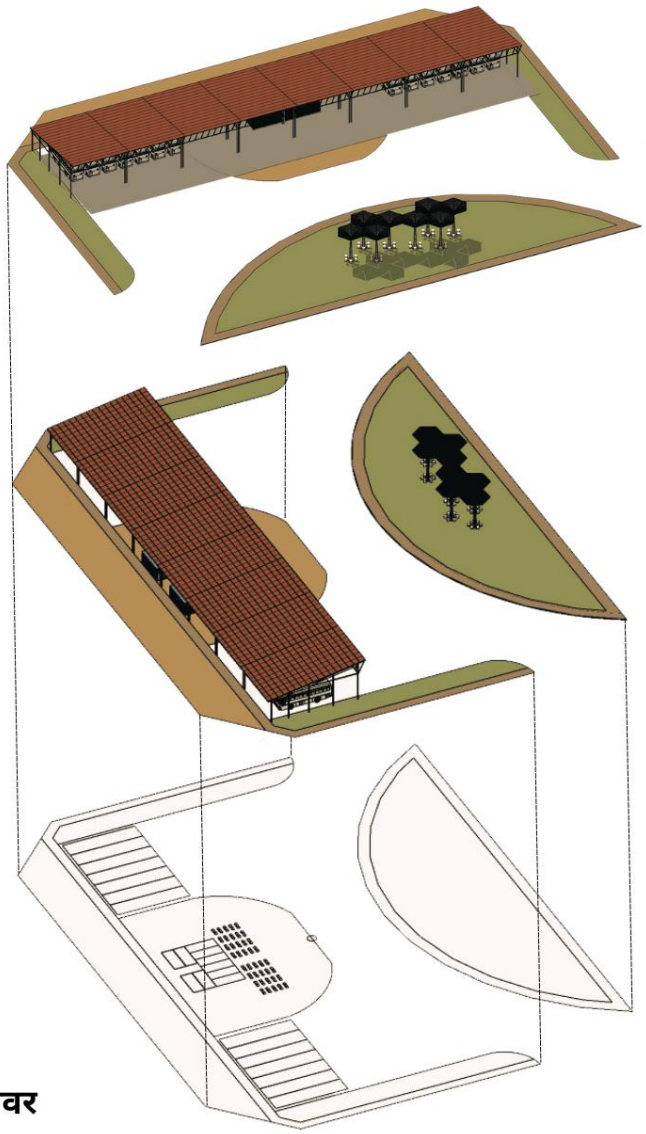
Triveni Sangam View Point
त्रिवेणी संगम व्यू पॉइंट

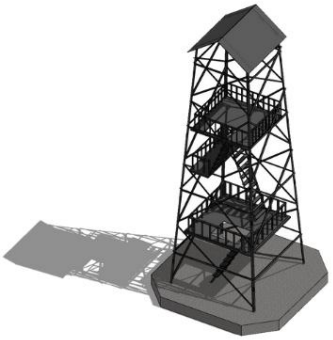
15.3 MAJOR BUILDINGS & SPACES

TRIVENI BUS TERMINAL



SANGAM BUS STOP

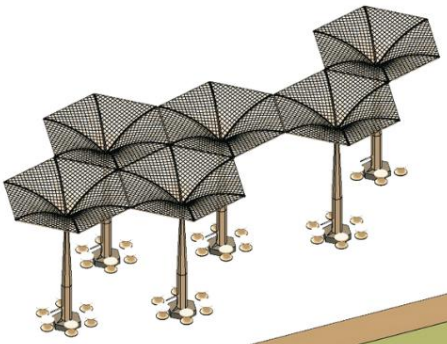




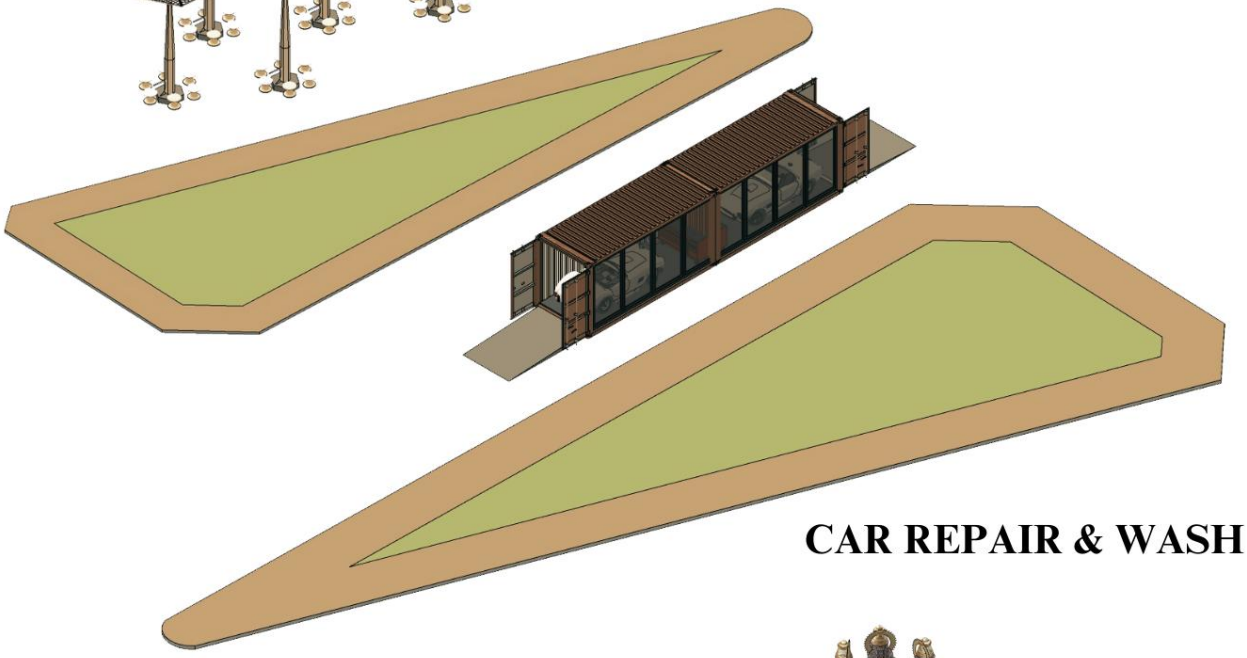
Watch Tower | वॉच टावर

FRONT ELEVATION OF SANGAM BUS STOP

REAR ELEVATION OF SANGAM BUS STOP



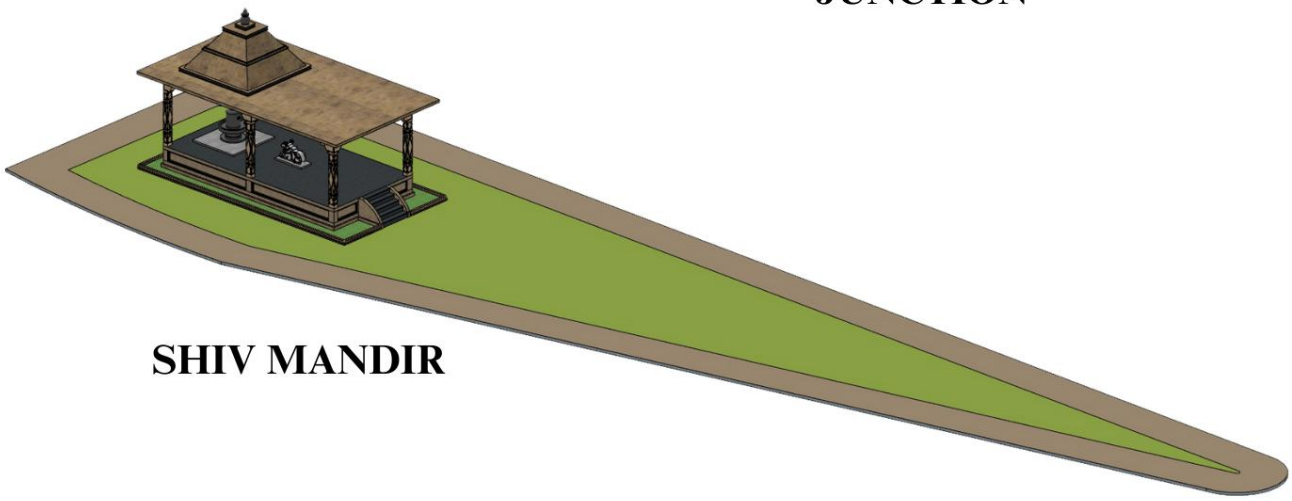
SEATING AREA



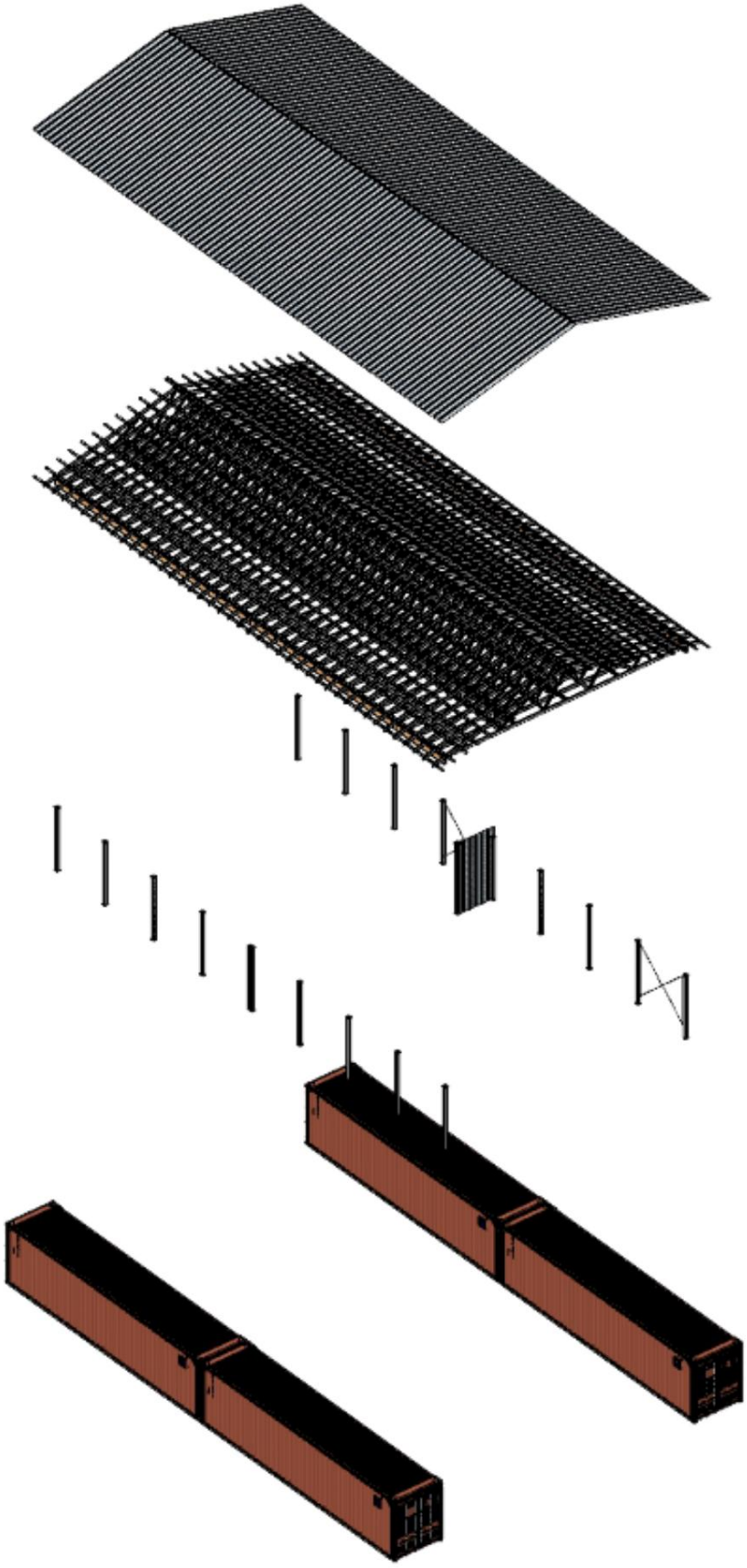
CAR REPAIR & WASH

SHIV CHOWK

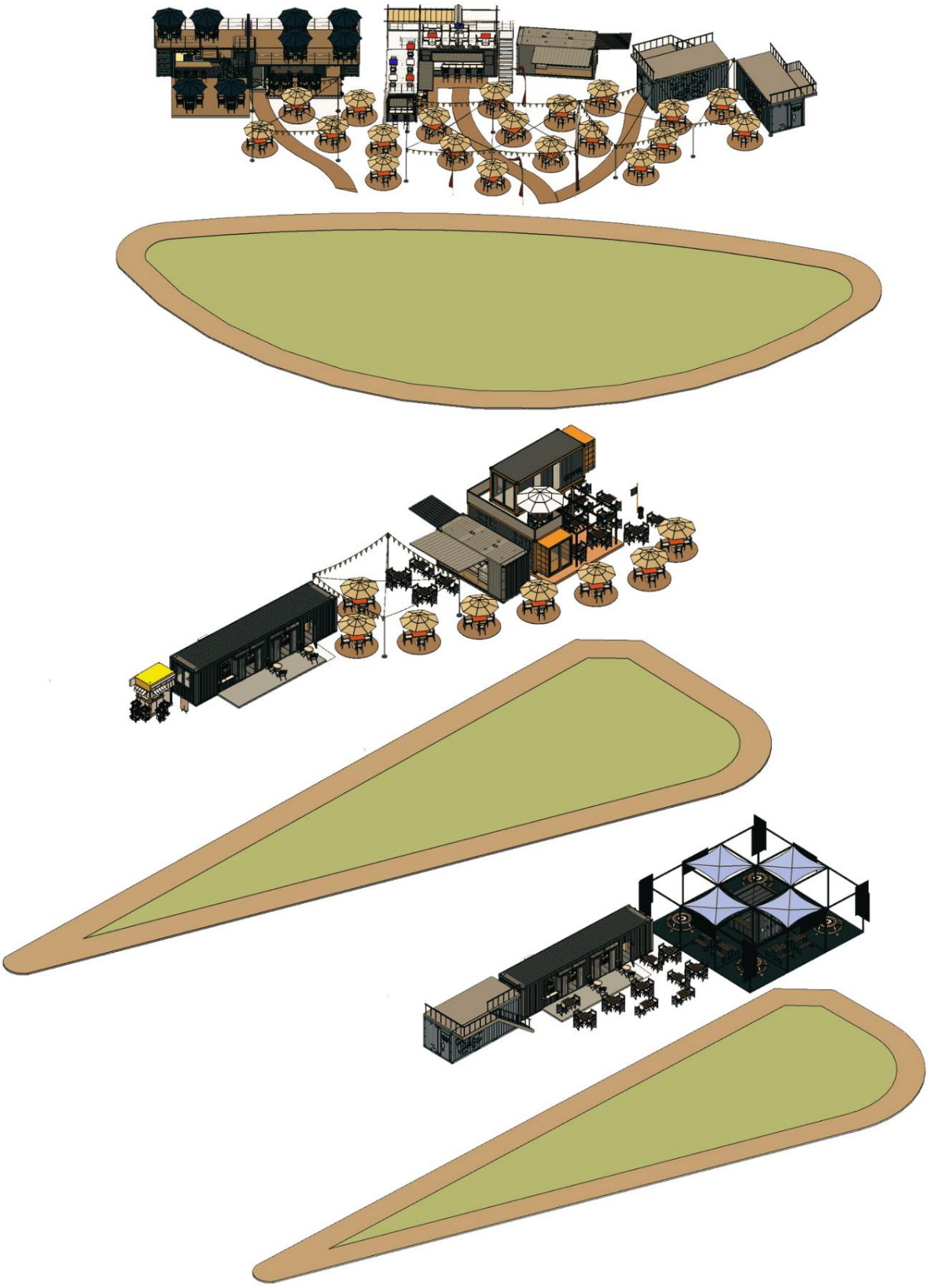
PANCH- MUKHI HANUMAN JUNCTION



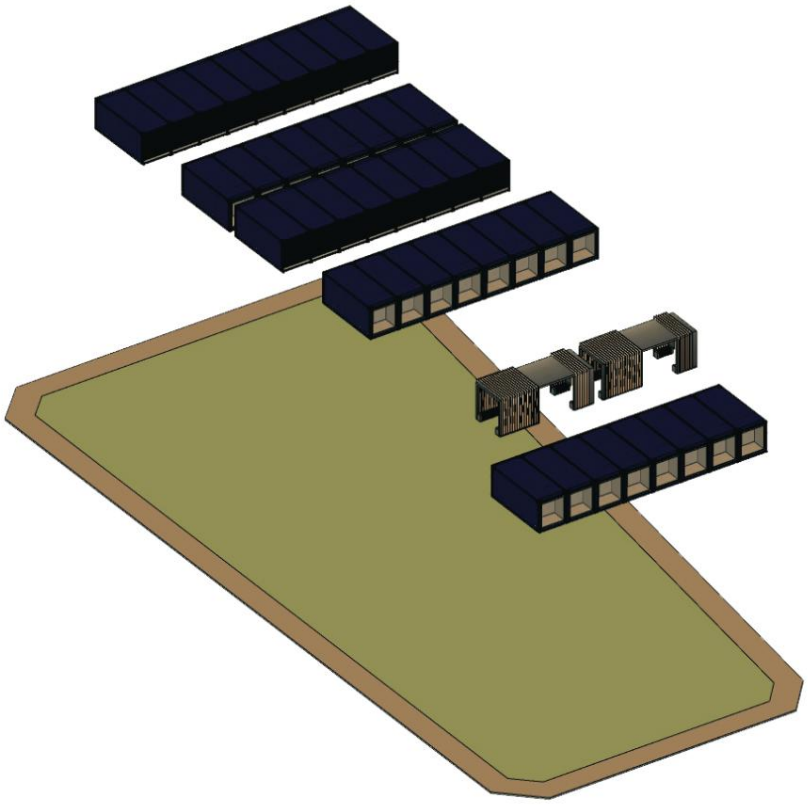
SHIV MANDIR



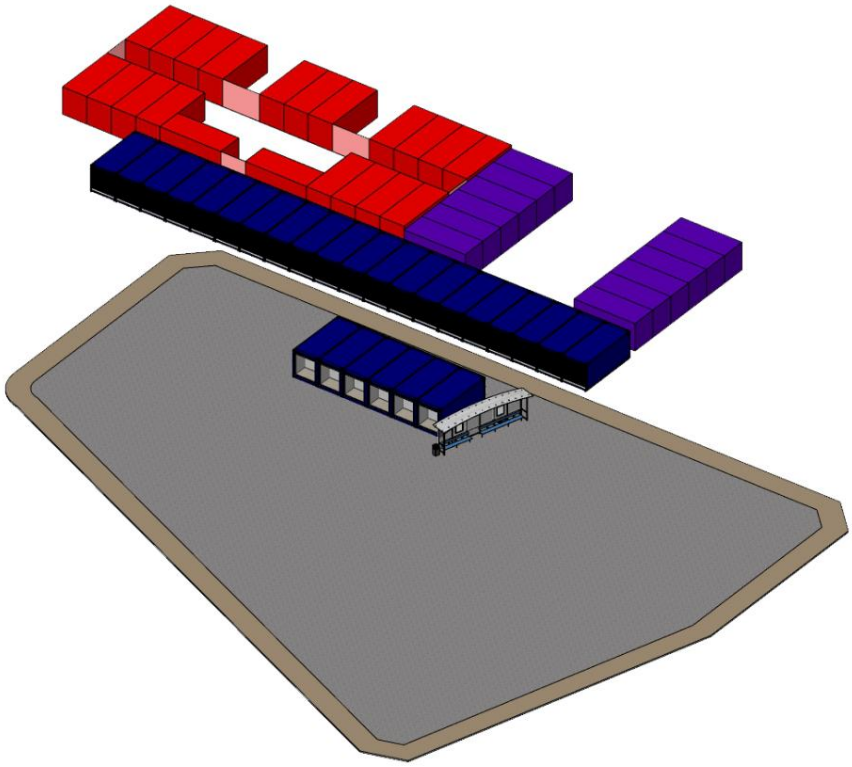
POOJA PANDAL



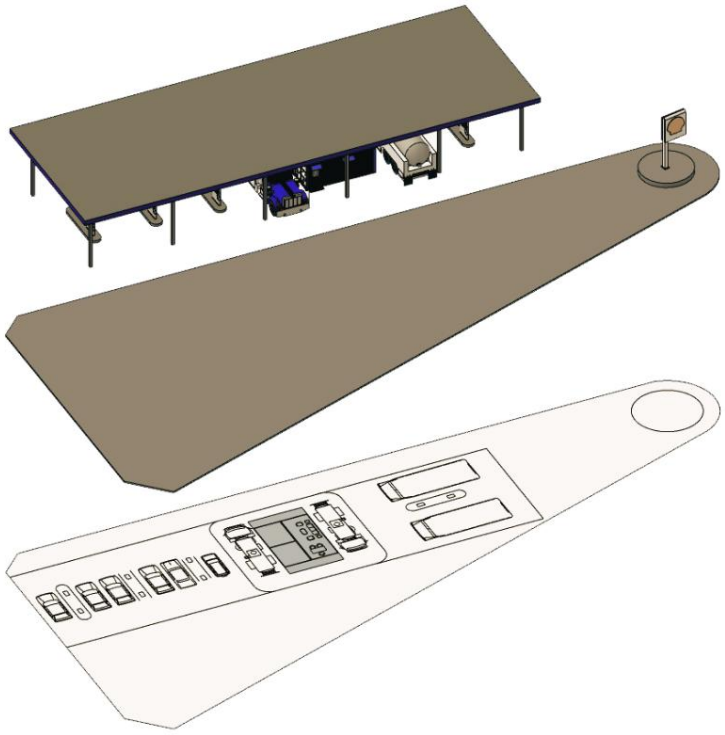
FOOD COURTS/CAFE/RESTAURANT



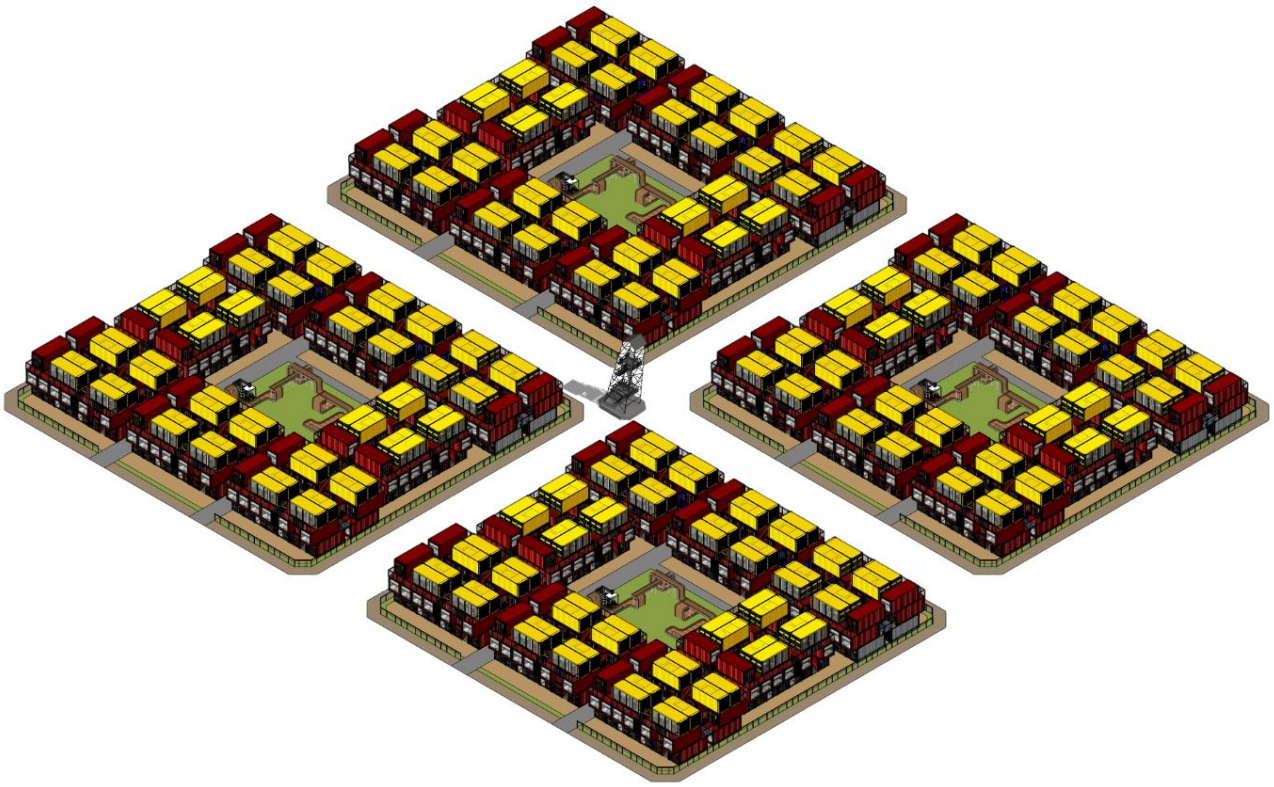
COMMERCIAL CENTER



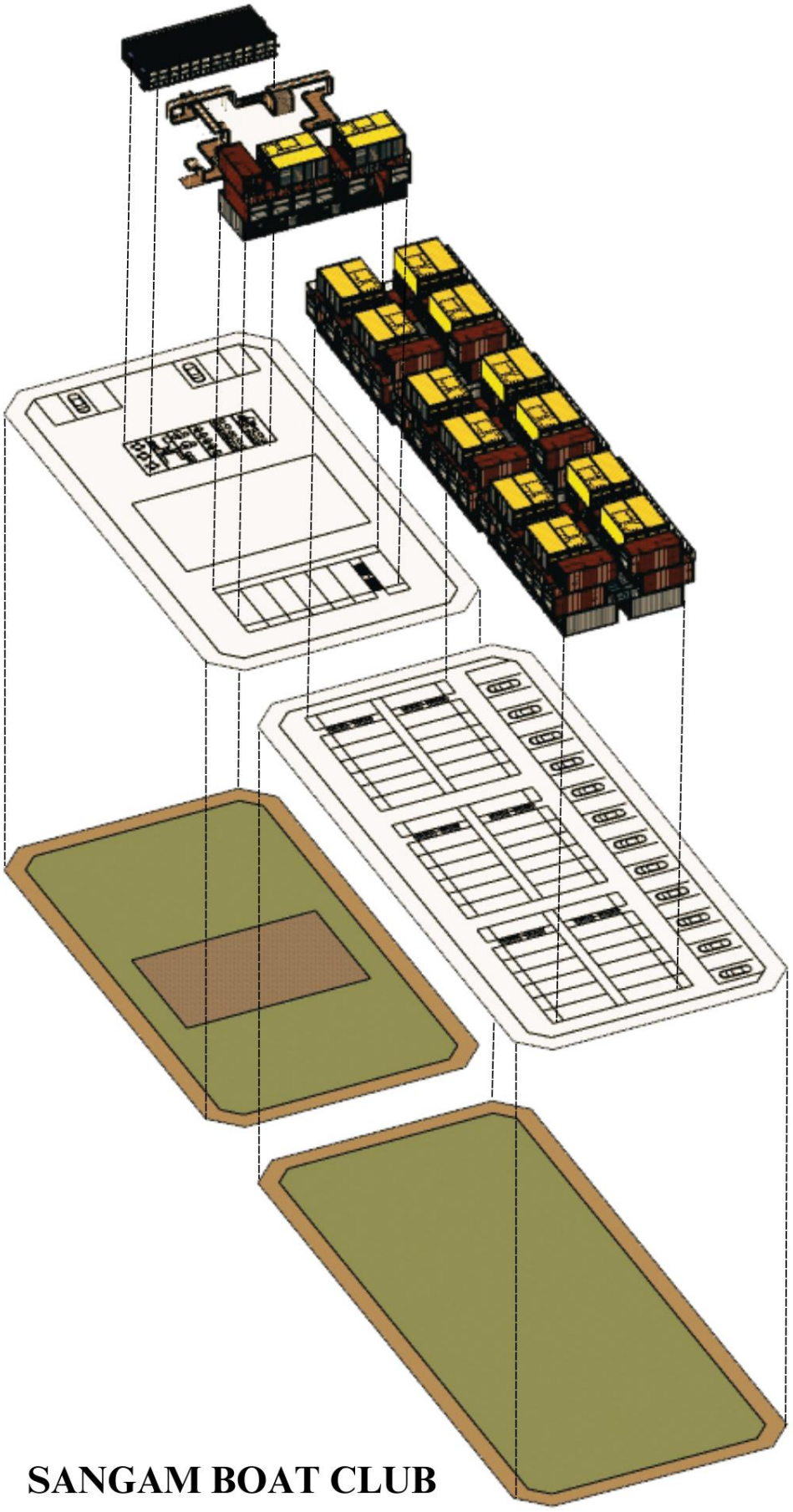
ADMINISTRATIVE CENTER



SANGAM PETROL PUMP



TYPICAL RESIDENTIAL SETTLEMENT



SANGAM BOAT CLUB

CHAPTER 16: CONCLUSION

In conclusion, the Kumbh Mela is one of the largest religious gatherings in the world, and its design and planning have a crucial role in its success. The Navagraha Planning System is a new design principle that can be used to improve the planning and management of the festival. By adopting this system, the festival can be organized in a way that is more efficient, sustainable, and user-friendly.

The design of the festival site, including the block design and the amenities provided, play a critical role in the overall experience of the pilgrims attending the festival. The development of a comprehensive master plan is essential in ensuring the smooth functioning of the festival.

The Kumbh Mela presents a unique opportunity to showcase the rich cultural heritage of India and to promote religious harmony and peace. With careful planning and innovative design, the festival can continue to attract millions of pilgrims from all over the world and provide them with a memorable and fulfilling experience.

In summary, the Kumbh Mela is a testament to the power of design and planning in shaping cultural events and experiences. The adoption of new design principles and innovative planning techniques can ensure that this iconic festival continues to evolve and thrive for generations to come.

16.1 DISCLOSURE STATEMENT

The author disclosed no possible conflicts of interest.

16.2 BIBLIOGRAPHY

Anastasia Karandinou, School of Architecture, University of Portsmouth, U. (2013). *No Matter: Theories and Practices of the Ephemeral in Architecture* (2013th ed.). Ashgate Publishing Company.

Andres, L., & Kraftl, P. (2021). New directions in the theorisation of temporary urbanisms: Adaptability, activation and trajectory. *Progress in Human Geography*, *45*(5), 1237–1253. https://doi.org/10.1177/0309132520985321

Anja Pirjevec. (2021). *Shelter and Sustainability*.

Armada, J. (2012). *Sustainable Ephemeral: Temporary Spaces with Lasting Impact*. https://surface.syr.edu/honors_capstonehttps://surface.syr.edu/honors_capstone/111

Bryson, J. R. (1997). Obsolescence and the process of creative reconstruction. *Urban Studies*, *34*(9), 1439–1458. https://doi.org/10.1080/0042098975501

Coetzer, N. (2013). *Building apartheid : on architecture and order in imperial Cape Town*.

Ashgate Publishing Company.

Davidson, C., Lizarralde, G., & Johnson, C. (2008). Myths and Realities of Prefabrication for Post- disaster Reconstruction. *4th International I-Rec Conference 2008 Building Resilience: Achieving Effective Post-Disaster Reconstruction (TG 63 - Disaster and The Built Environment)*, *May*, 14. http://www.sheltercentre.org/sites/default/files/IREC_MythsAndRealitiesOfPrefabricati onForPostDisasterReconstruction.pdf

Dinesh kumar, N., & Kathirvel, P. (2015). Comparative Study on Prefabrication Construction with Cast In-Situ Construction of Residential Buildings. *IJISET - International Journalof Innovative Science, Engineering & Technology*, *2*(4), 527–532.

Elsner, J. (2000). From the culture of spolia to the cult of relics: The arch of constantine andthe genesis of late antique forms. *Papers of the British School at Rome*, *68*, 149–184. https://doi.org/10.1017/S0068246200003901

Gharehbaghi, K., Mulowayi, E., Rahmani, F., & Paterno, D. (2021). Case studies in modular prefabrication: Comparative analysis and discoveries. *Journal of Physics: Conference Series*, *1780*(1). https://doi.org/10.1088/1742-6596/1780/1/012009

Hagan FAIA, S. R., & Box, P. (2020). *Pop-Up and Pre-fabricated Architecture AIAPDH186*

3.0 PDH/3 CE Hours/3 AIA LU/HSW. www.pdhacademy.com

Jaillon, L., & Poon, C. S. (2014). Life cycle design and prefabrication in buildings: A review and case studies in Hong Kong. *Automation in Construction*, *39*, 195–202. https://doi.org/10.1016/j.autcon.2013.09.006

Khan, H., & Jain, K. (2017). Study on the Trends & Usage of Prefabrication and Modularization: Increasing Productivity in the Construction Industry. *InternationalJournal of Civil Engineering Research*, *8*(2), 81–89. http://www.ripublication.com

Li, Z., Shen, G. Q., & Alshawi, M. (2014). Measuring the impact of prefabrication on construction waste reduction: An empirical study in China. *Resources, Conservationand Recycling*, *91*, 27–39. https://doi.org/10.1016/j.resconrec.2014.07.013

Long, J., & Hadley, B. (2016). Architecture of (Im)permanence. In *Travelling Scholarships Journal Series*. www.architects.nsw.gov.au

Madanipour, A. (2018). Temporary use of space: Urban processes between flexibility, opportunity and precarity. *Urban Studies*, *55*(5), 1093–1110. https://doi.org/10.1177/0042098017705546

Michel Danino. (2018). *Fabricating Evidence in Support of the Aryan Invasion / Migration*

Theory Paper presented at a National Conference on Indian History : Emerging Perspectives organized by Indian Council of Historical Research ,. 1–27.

Palanichamy, M. S., Schlenk, M., & College, E. (2002). *Prefabrication techniques for residential building Prefabrication techniques for residential building*.

Prasher, E. (2016). Prefabrication in Ancient Period. *IOSR Journal of Mechanical and Civil Engineering*, *01*(01), 34–39. https://doi.org/10.9790/1684-15010010134-39

Rodríguez-León, M. T., & Sanchez, J. (2013). *Ephemeral architecture: Portadas de Feria deSevilla*. https://www.researchgate.net/publication/339507991

Smith, R. E., & Narayanamurthy, S. (2009). Prefabrication in Developing Countries: a case study of India. *Wood Strucrures Symposium*, 48–53. www.earth-auroville.com

Sravya Sirigiri. (2021). *translient urban forms-manifestations of impermanence vs permanence. syracuse university.*.

Vardia, S. (2018). *Building Science of Indian Temple Architecture Shweta Vardia Building Science of Indian Temple Architecture*. *July 2008*.

Yupeng Luo, D. R. R. and M. J. H. (2005). *Luo et al . 2005 Lean Principles for Prefabrication in Green Design Build (GDB) Projects*.