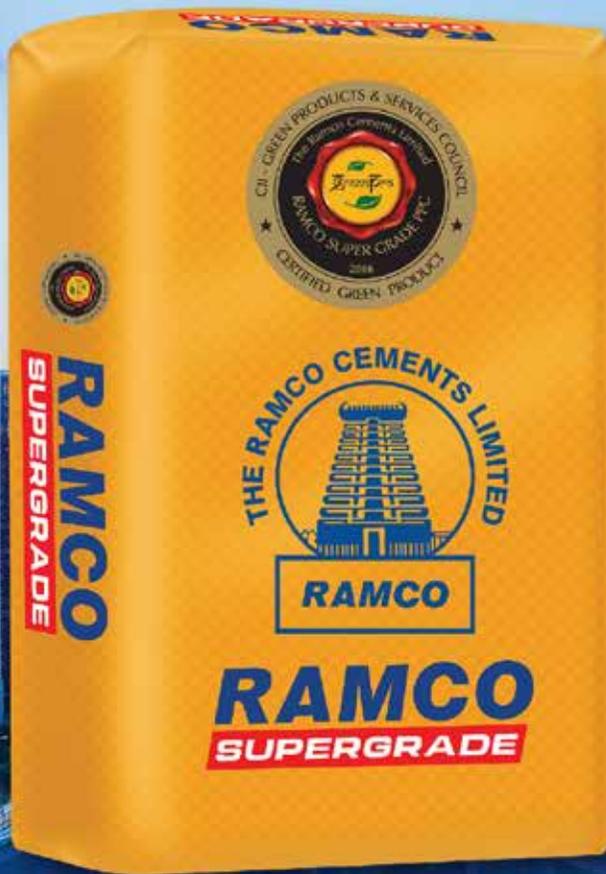


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# +HEALTH CARE

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JOURNAL OF THE INDIAN INSTITUTE  
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The July issue of our journal focuses on healthcare. The growing Indian hospital industry accounting for 80% of the total healthcare market is expected to touch US\$ 132 billion by 2023.

The physical environment of healthcare buildings has great importance in issues such as patient safety, functional efficiency, user satisfaction, healthcare outcomes and energy consumption. Hospital Design all over the world is being redefined to make space a catalyst of healing and rejuvenation and to reduce negative experiences that come with visiting a hospital. In India, on the one end of the spectrum we have swanky large hospitals and on the other hand we have small healthcare centres offering healthcare to the majority of our population. It may be time to reflect on how our fraternity can make design accessible at all points of the spectrum. We cover quite a few outstanding hospital projects in this issue.

Dr. R Chandrashekar has written an article on 'From Healthcare Infrastructure to Holistic Healing'.

Prof. Akhtar Chauhan reflects on the evolution of JIA through past years.

We continue with our regular columns like Dialogue, Young Practice, Sketches, Travelogue etc.

We are encouraged by the positive response by many members on the contents and layout of the Journal.

Keep sending us Articles, Design features, Research Papers etc.

**Ar. Lalichan Zacharias**  
Editor

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# PRESIDENT'S MESSAGE

Dear Members,

Greetings!

Towards membership extension, it is good to note that Sub-Centres have been formed at Rourkela in Odisha, Talegaon Dabhade in Maharashtra, Vindhya in Madhya Pradesh, Kakinada in Andhra Pradesh, Kapurthala-Hoshiarpur in Punjab and more to follow. Chapters and Centres can identify cities and towns with substantial presence of architects, coordinate and help the formation of new Centres/Sub-Centres to be part of our Institute and Programs.

Sustainability is the buzzword in every architecture conference and discussion but are we addressing it in its true sense and demonstrating its full potential. There are many architects across the country, who are doing sustainable projects in the real sense of the term using local materials, resources, artisans, building techniques, planning, use of natural light and ventilation, etc. These have to be brought to light. Chapters and Centres can identify such works & available regional resources and pass on the information to our Sustainability Committee headed by Ar. Debatosh Sahu for compilation and brining out a Publication that can be useful for all.

We are happy that three of our members who are part of the IIA National Council – Ar. Lalichan Zacharias, Chairman - Publication Board, Ar. Punit Sethi, Chairman – Haryana Chapter, Ar. Nandlal Chandel. Chairman – Himachal Pradesh Chapter have been elected to the Executive Committee of the Council of Architecture. Congratulations and best wishes to them.

The IIA National Awards 2021 for Excellence in Architecture have been announced. Participation is the key to experience the outstanding work of our members.

There are requests from many affiliated Institutes for the formation of Student Centres. A set of guidelines for the formation of such Centres is being sent.

The recently concluded 'Madhya', IIA Central Regional Conference (CRC) 2022, hosted by IIA Madhya Pradesh Chapter along with the participation of Rajasthan, Chhattisgarh, Gujarat Chapters was a grand success. The Organization of the event, participation, program, speakers and hospitality are highly appreciated. Congratulations to Madhya Pradesh Chapter, its Chairman Ar. Jitendra Mehta and the entire team in the successful conduct of the CRC.

The ARCASIA Forum 2021 is being hosted by the Union of Mongolian Architects in Ulaanbaatar, Mongolia from 5th to 9th September 2022. Members desirous of attending may register on the Forum's Website.

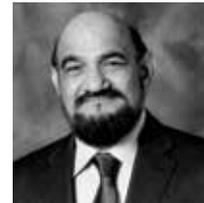
JIIA has been accredited as a Referred Journal by the UGC. Appreciate the Publication Board for their efforts.

The Chapter wise Young Architect Award nominations and the Best Outgoing Student nominations from Affiliated Institutions have been announced and we look forward to receive them in time for their presentation.

With best wishes,  
**Ar. C. R. Raju**  
 President, IIA



**Ar. C.R. Raju**  
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# COMMENTS

Dear IIA & Publication Team,

This is to acknowledge the receipt of three copies of the JIIA issue of May 2022 to us both authors & winners of the Award 2020 under 'Research' category.

Thanking greatly for the sending the copies.

Extending our congratulations to the entire Editorial team for another fabulous issue of the Journal. Looking ahead to forthcoming issues as well.

Thanks & best regards.

**Dr. Mamatha P. Raj**  
Prof & Director, BMSCA  
&

**Dr. Dakshayini R. Patil**  
Prof, BMSCA Bull Temple Road, Bangalore.

Another great issue. Loved the compilation.

**Dr. Dakshayini Patil**

I must congratulate the Editorial Team of the JIIA for such a wonderful job in elevating the quality of the Journal/Magazine. It reflects the contemporary times and is a breath of fresh air. A worthy occupant of our Coffee Tables. Hats off to the team.

**Ar. Kamal Passi**

**We welcome your comments and suggestions.**

Please write to us at [jiiaeditorial@gmail.com](mailto:jiiaeditorial@gmail.com)

## THEME

# HEALTH CARE ARCHITECTURE

Rushing to a health care centre or hospital, little do people think about how complex the various activities that coexist in the building are. Human life is linked with 'intense' sentiment and the Health Care Architect has to first address that aspect. So, when we see the Emergency door, as the nearest approach to the road - then remember the architect has done a fine job of reducing the time taken to reach health care.

But this is just the tip of the iceberg. The physical environment of a healthcare building has great importance in issues such as patient safety, functional efficiency, user satisfaction, healthcare outcomes and energy consumption. And only after great research and experience can architects do justice to such a project. Some examples of which we shall see in the following pages.

A hospital building has very similar facets to that of a hotel building with regards to services and staff movement. But it is the human factor that changes the complete dynamics of the two similar-looking buildings. One is built for leisure and has large spaces and facilities to address the utility of the building. The other is built for saving and preserving human lives, so puts a greater responsibility on the architect to ensure quick and efficient movement of people, goods and services.

And when talking about the MEP services the hospital goes an extra mile to achieve the perfect design. Because we have several more entries and exits for certain services like oxygen lines, microbiological control, HVAC, waste segregation and disposal/ incineration to name a few.

Having said that, we all know that such complex buildings require greater collaborative efforts between other architects, engineers, doctors, construction workers, etc. which can be seen in most of the good hospitals around the country. And now Architects have gone a long way from the old single corridor and courtyard planning to complex intermixing of spaces to cater to the requirement of both Outdoor and Indoor patients. And not to forget that substantial parking spaces and other outdoor utilities that now is mandatory for high-volume hospitals.

Healthcare design underwent a very interesting change due to the COVID epidemic. The speed of building a hospital was of utmost importance. Many countries showed us how a 1000-bed pavilion with temporary facilities could be built within ten days. The 25,000 sqm Huoshenshan Hospital in Wuhan city was built in ten days to tackle the coronavirus. This Huoshenshan Hospital was based on the Xiaotangshan Hospital set up in Beijing in seven days in 2003 and holds the record of being the fastest built hospital on the planet. So they had the blueprint and technology and willpower to build it.

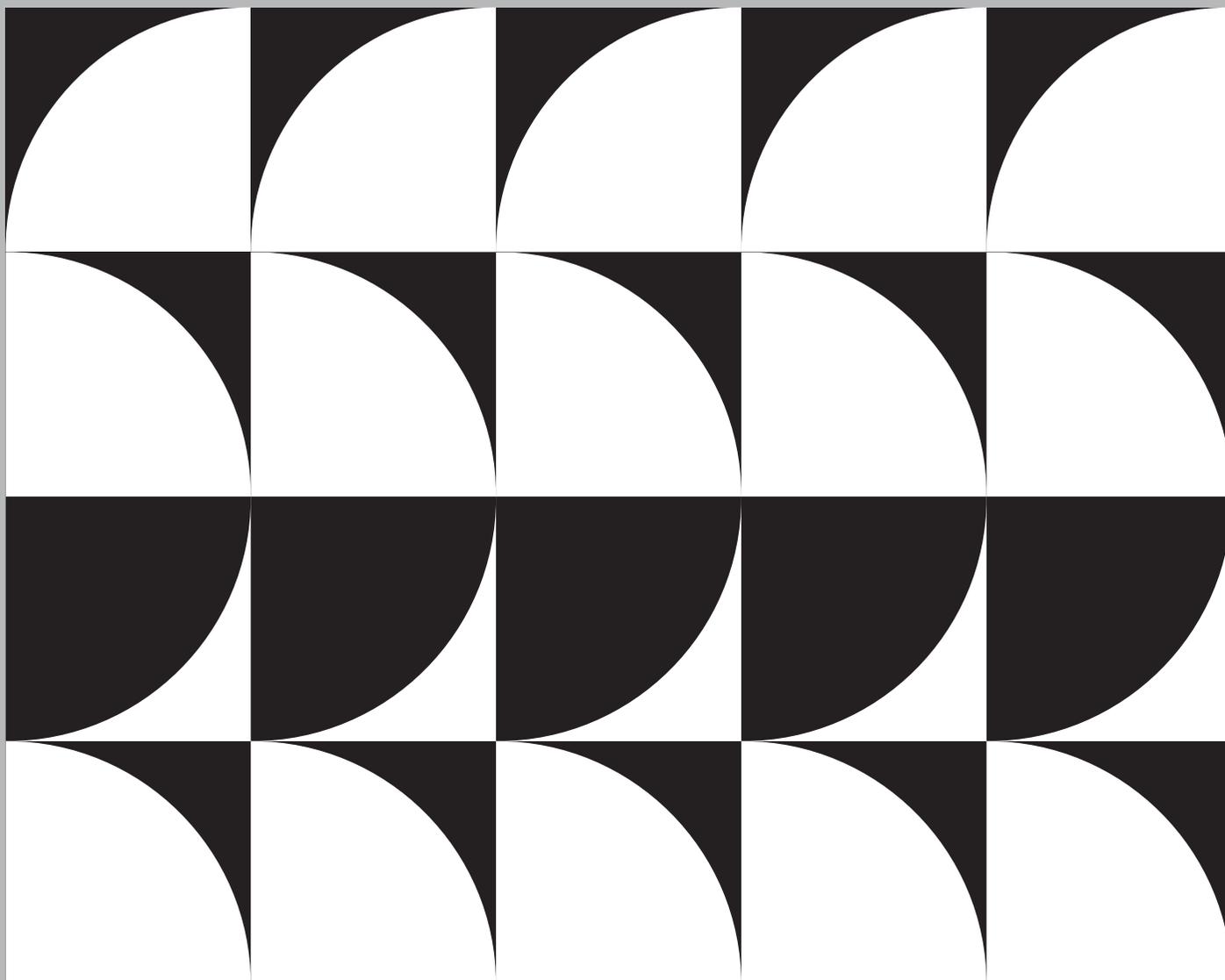
This model got replicated throughout the world and in India, emergency hospitals grew like mushrooms in all major cities. Healthcare Architects were working day and night to get the right module in place, ensuring that the speed of construction was not hindered due to a complex design. At the same time ensuring the safety of the doctors and nursing staff from the epidemic.

In fact, in the post-COVID, months there has been a sea change in the attitude of the Hospital Administration who is now giving architects more freedom in designing interesting outdoor and indoor spaces in the built form. The importance of fusing technology with practical know-how of a health care centre of any size has been understood. Now interior designing has been accepted as an important tool to aid in the speedy recovery of patients. The results are now being seen and appreciated by all.

So happy reading ..... Hope you enjoy Health Care Design in this issue.



Ar. Mukul Goyal



## RESEARCH

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### **Separate but Equal?**

**Understanding Gender Dynamics and Its Implications for Gender-Inclusive Design**

*Ar. Trishla Chadha*



### **THE UNSPECIFIED ARCHITECTURAL HARMONY BETWEEN JEWISH TEMPLES AND DRAVIDIAN HINDU TEMPLES**

*Smeya Shirley Deborah, Dr. Sharmila Jagadisan*



**Investigating the factors increasing place attachment of children with autism in outdoor rehabilitation centres**

*Amirsalar Dastoori*

# SEPARATE BUT EQUAL?

## Understanding Gender Dynamics and Its Implications for Gender-Inclusive Design

**Ar. Trishla Chadha**  
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## ABSTRACT

*Architecture is an artistic field that creates a spatial system in a specific social context, with a distinct identity, the causes and effects of which are still unclear. To embed architecture with spatial identity, it should have a social dimension. The tense relationship between architecture and gender is not new, but it is a topic that has been investigated since the 1960s. Through the diverse behaviours and experiences of its inhabitants, the city is gendered. It shapes us differently, not only because of physical differences but also because of growing differences in gender roles that shape how we need, use and perceive the city. This may be accomplished by creating a safe and inclusive environment enabling women to pursue their individual aspirations. This paper examines the current literature regarding the gender-sensitive approach to urban planning and management of public spaces. The objective was to determine the vulnerabilities and impact of gender on spaces through existing research focused on historical and contemporary women domains governing the spatial perceptions and explore potential planning interventions. The methodology follows an inductive research approach and uses the arbitrary method for analytical research through scholarly writings. The argument for this consequence makes the statement that people's behaviour and accordingly, the way in which spaces are utilised is shifting and that this results in gender-based urban development.*

**Keywords:** Gender-based Development, Environmental psychology, Space syntax, Inclusive cities, Attention economy, Cyber-feminism.

## INTRODUCTION

Following economic liberalization, cities in India have undergone constant remodelling to keep up with the unprecedented urbanization. The rapid expansion essentially exclusive in character has opened a whole new chapter of experimentation, drawing linkages between urban growth, governance and communities. Along with this wave of urban expansion, there is an underlying trend that marginalized groups in society are becoming more vulnerable and isolated. These groups have historically faced discrimination due to their gender, class, age, or sexual orientation.

Cities have long been envisaged as liberating, collaborative and idea-generating environments. The current situation is such that, while cities offer many opportunities to both men and women, whereas, the nature of urban development have led to an increase in exclusion, specifically from marginalized sections; it has reinforced the already existing framework of gender-based discrimination. This vulnerability is demonstrated by the difficulty these disadvantaged groups have navigating the city, which negatively affects their quality of life. They are thus excluded from or unable to take advantage of the city's resources. Gender is one of the main categories of discrimination and exclusion among many others. Several factors influence women's access to the city. In a framework that extends beyond the most obvious and immediate manifestations of violence and includes concerns with infrastructure, urban design and governance, gender-based intolerance and safety are now being dismantled.

In terms of their safety and security, women in India—who represent half of the population—are now the section most at risk. We see multiple headlines about

rapes, trafficking, sexual assault, molestation and other acts of violence against women in public places while we go through the newspaper. According to the National Crime Records Bureau, there were 228,650 crimes against women in 2011, including murder, rape, kidnapping and sexual harassment. In the same year, India was ranked the fourth-most hazardous nation in the world by an international poll, only behind Afghanistan, Pakistan and the Democratic Republic of the Congo (Goldsmith & Beresford, 2018).

Women experience violence in both public and private settings, which is frequently impacted by decisions made about urban planning and the organization of public facilities. They encounter a higher degree of insecurity which limits their 'access' to and 'use of the city' (Newman, 1973). In times of war or social instability, conditions like poor street lighting, insecure public spaces, inefficient neighbourhood policing and unreliable public transportation can make gender-based violence far more likely to happen.

Initiatives by the government and the police to address the issues of safety and violence against women in a cohesive way have not been very effective. Technologies like panic buttons and GPS tracking have a limited ability to enhance public safety. Although these programs deserve praise, their main flaw is that they keep out women who lack access to such technology. Even in a broader sense, urban planners consider user groups of varied age groups, the disabled population, etc., but there are just a few instances of gathering data and considering the design of women-friendly urban areas. The prime way to resolve the issue is to create and implement a new paradigm for the house, neighbourhood and city that begins to explain the physical, social and economic design of places which encourage women's activities rather than restricting them. The research aims to throw new light on gender inclusion and makeshift modes of life on the margins, which are rarely considered or extensively studied in terms of their potential to produce alternative urban futures.

## METHODOLOGY

The methodology explores the historical and contemporary facets associated with gender and public spaces. Twenty-five scholarly writings were chosen from approximately 450 sources acquired using EBSCO Host, Google Scholar and internet searches. Articles were selected on the basis that they were reliable research sources, relevant to the public space contextual analysis, including the gender dimension and published in the last three decades. The author reviewed the selected literature, resulting in those appearing in this review paper. The study would be supported by inductive reasoning to arrive at an action research plan.

## HISTORICAL CONTEXT OF FEMINIST MOVEMENTS AND THEORIES

The feminist movement's evolution in the West is typically depicted as 'waves of change,' reflecting the movement's peaks and troughs (Andrews & Biggs, 2006). The first wave of feminism began in the late 1800s and early 1900s with the primary goal of ensuring women's



Figure 1: The feminist movements during the 1960s – 70s (Source: <https://www.femcrunch.com/tracing-history/>)



Figure 2: The stepwells of India, Rani ki Vav in Gujarat (Source: Flickr)

voting rights. The second wave began in the 1960s, propelled by a growing sense of self-awareness among minorities (Bryson, 2016). The concept of 'universal femininity' was demolished in the third wave, which focused on individual rights rather than social goals (Connell, 1987). According to narratives of feminism's history, the Woman Liberation Movement of the 1960s codified a notion that women's personal experiences should serve as the beginning point for comprehending their conditions and taking potential action in response to them as seen in figure 1 (Eisenstein, 1984).

Feminist views emerged as a valid subject of study in disciplines such as sociology, geography, anthropology and political science during the 1970s and 1980s (Meyer, 1995). By questioning women's invisibility and stressing the androcentric or male-centred nature of previous systems, feminist viewpoints provided a fresh perspective on the world and refined social, political and economic relations (Greed, 1994). Despite being community-driven, feminist groups have historically lacked inclusion, often growing inside a constrained Western upper-class mindset, concentrating on their issues and wants (Little K., 1980). The background of these movements in the nineteenth century was built

by early feminist views. On the one hand, there were some who believed in biologically determined gender (Connell, 1987), and on the other, those who contended that while biology provides the primary difference between men and women, the difference is built upon and reinforced by societal roles, as stated in the Sex-Role Theory (Segal, 1990). The notion that gender relations are based on biology, on the other hand, is untenable.

Over the millennia, the position of women in India has seen significant changes. Their history has been dramatic, from a deterioration in their standing from ancient to medieval times to the championing of equal rights by various reformers (Brydon, 1989). Women were given distinct places from the general public in terms of architecture. In forts, like the Amer Fort, the *zenana* was the interior chambers of a home where the family's ladies lived. The *zenana's* vastness made it a community unto itself, which need methodical management to keep it running. The *mardana* is the exterior quarters for visitors and males, and it is the South Asian version of the harem for those who maintain purdah. Due to the severe limitations on access to the women's quarters, there are relatively few accurate records of their descriptions.

Through the imposing influence of wall planes, the shift in levels, confined entry, indirectness of movement patterns, sequence of gates and general opacity indicate visual thresholds to these realms. The palaces were frequently built on a hill, which changed the levels of privacy and the hierarchy of areas. Historical monuments frequently tell us stories about men, power, and battle. The Gujarat stepwells (figure 2) provide a pleasant counterpoint to this paradigm, as they convey stories about women, water and life.

The study suggests that women's needs, experiences and perceptions have been ignored by the built environment professionals from the beginning of feminism, according to activists and theorists using feminist analytical techniques (Whitzman, 2013). The built environment contributes to the production and interpretation of information that has a direct material impact on everyone's life.

### INTERSECTIONAL GENDER DOMAINS

The history of the feminist movement given above shows a minor but significant shift in how the 'issue' of men's and women's differing lived experiences has come to be understood (Bondi, 1990). The late-nineteenth-century discipline of urban studies exemplifies a very limited perspective, as it was unmistakably a male realm (Brownmiller, 1975). Not only has most of the writing about the city been androcentric (or male-conceived), but it has also been occidental-centric (or western-conceived) (Jones, 2016), failing to reflect the subjective reality of men and women in both the global north and south.

The twentieth century saw the emergence of pivotal men's studies and the publication of influential texts highlighting challenges and issues to masculinity-related to de-industrialization and male unemployment (Wieser, 2019) - and the diversity of masculine identities, including those reflecting cultural pressures to repress homosexual orientations or to 'come out' against dominant heterosexual norms (Connell 1995, Hoggart, et al, 1992; Mac an Ghail 1994; Robinson, 2005). Along with this shift toward the intersectional interweaving of gender and sexuality identities with other social inequalities, there was an increasing reluctance in some academic circles to utilize gender as an analytic category. This method demonstrates the vital development of a gender-conscious setting, presenting a new meaning in architecture. Intersectionality as a conceptual framework could be explored further, resulting in an excellent canvas for the 'intertwined' approach to an explicitly gendered urban theory aimed at inclusive design.

### ROLE OF WOMEN IN SOCIETY

While domestic and reproductive activities are frequently associated with women, they are involved in the other significant elements of home and community management. Feminists coined the term 'triple role' (see figure 3) to describe and appreciate women's labour, whether paid or unpaid. It's also supposed to separate labour from anything that's sexually determined and to emphasize those gender roles as we know them, are neither strict nor universal.

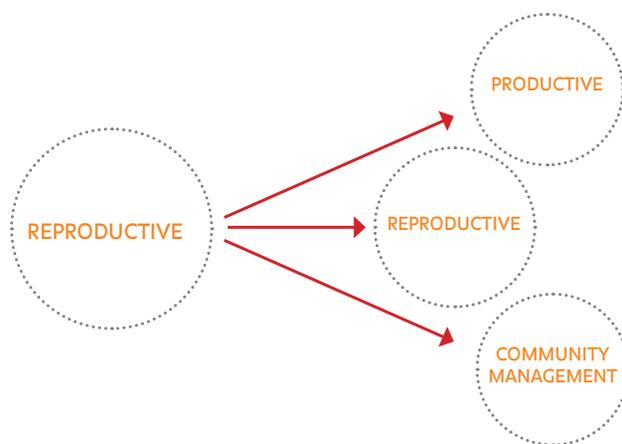


Figure 3: The role of women in the society  
(Source: <https://www.femcrunch.com/tracing-history/>)

To dissolve roles and work that is often muddled or devalued, gender, sex and development communities have developed the below categories:

- *Reproductive Role*: Child-bearing: rearing obligations, as well as home tasks, are essential to ensure the labour force's maintenance and reproduction. It encompasses the biological reproduction and the maintenance of the current workforce including male partners and working children as well as the future workforces such as school-going children.
- *Productive Role*: Both men and women work for remuneration in cash or in kind. It comprises market-based and exchange-valued production, as well as home-based production with actual use-value and potential exchange-value.
- *Community Managing Role*: Women's activities at the communal grade, primarily as an augmentation of the assigned reproductive roles, to assure the availability and upkeep of scarce collective consumption resources such as food, water, health care and education. It is therefore unpaid volunteer work done in 'free' time.

Women in community management roles are frequently competent and powerful, but their success is predicated on organizing within their own domain (Borden, 2002). If they choose to pursue a career in (male-dominated) politics, they may face considerable opposition and controversy, reaffirming gender stereotypes.

### ARCHITECTURE- A MAN'S PROFESSION

The discursively created world of architecture appears to be a world built for and inhabited by men. The idea that the 'typical' human is male indicates that not only is the human body that occupies architecture a male body, but that human subjectivity is also gendered masculine, as evidenced by the architect's inventiveness (Little K., 1980). Women's existence and agency, not only as designers but as inhabitants of constructed settings, are almost largely ignored in western architectural theory and practice (Janes, 1884). Women are effectively absent as protagonists in the history of architecture and appear in the discourse only as peripheral and marginal figures (Negami, 2018).

## MALE AND FEMALE OCCUPATIONS IN 2015

Larger circles represent more common jobs.

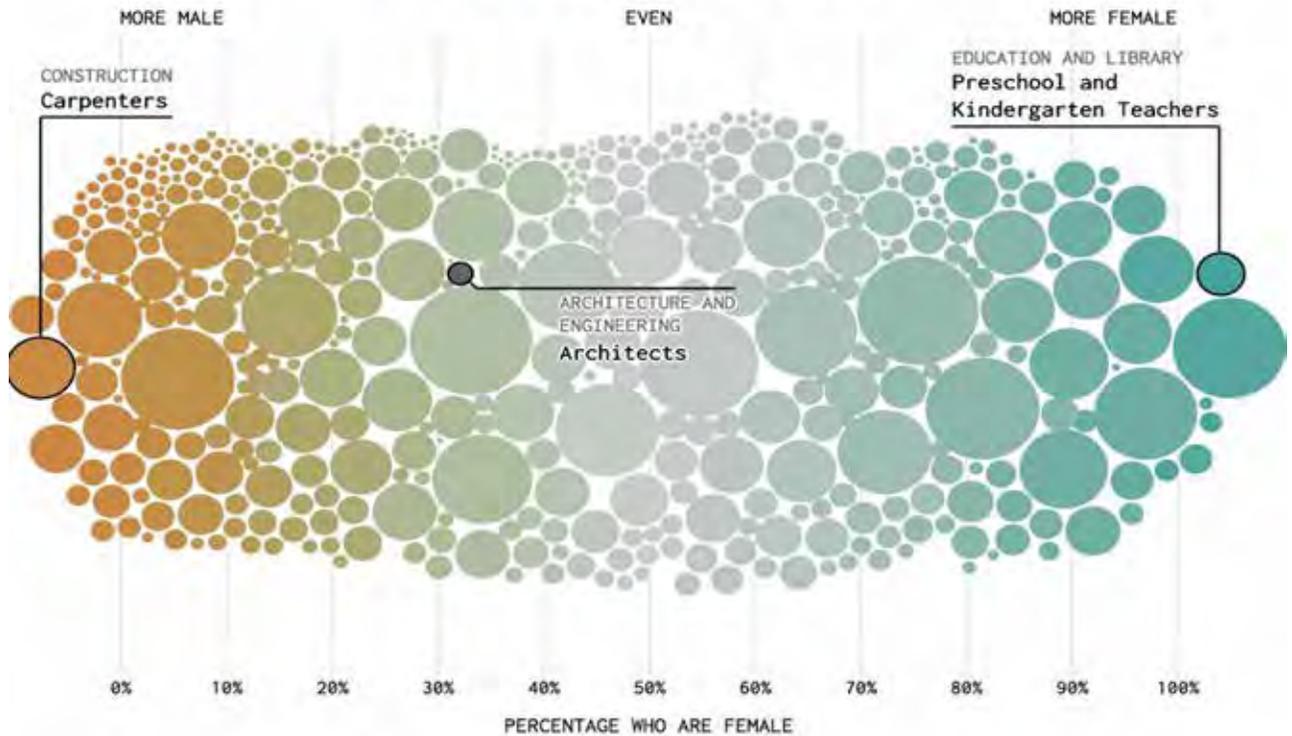


Figure 4: The differentiation between men and women in workforce (Source: Adapted from 'Women and Planning: Creating Gendered Realities', 1994)

The 'feminine' is called on only as support, foil, or muse to the masculine or as a symbolic figure for nature and the exotic (Segal, 1990). The built environment is a powerfully determining human creation that both reflects and conditions the life experiences of its inhabitants and the relationships between them (Proshansky, 1970). The vectors of inequality and difference are multiple- class, gender, race, culture, age and sexuality- which intersect in a complex matrix (Connell, 1987). The development of our cities and suburbs is influenced directly and indirectly by systems and mechanisms of power and control from which women have been and remain almost totally excluded as shown in figure 4 (Faure, 2003).

Since the advent of feminism, activists and theorists deploying the tools of feminist analysis have remarked on the generic neglect by the built environment professions of the needs, experiences and perceptions of women (Kusum, 1996). The built environment helps to produce and interpret direct material effects on the lives of all people (Warren, 1922). The built environment as 'ground' and architecture as 'figure' reflect and perpetuate class and ethnicity-bound social, cultural, and political imperatives and are specific to time and place (Janes, 1884).

### GENDER SPATIAL PERCEPTIONS

Men and women have varied perceptions of the settings they appreciate and experience. Their perspectives are shaped by biological differences, gender socialization, and previous experiences (Little, 1980).

Karen Franck identifies six characteristics that distinguish feminine or feminist ways of knowing and analyzing:

- 1) A yearning for inclusion as well as the ability to transcend conflicting dualities
- 2) A sensitivity to the interconnectedness of categories, as well as an underlying connection to others, objects of knowledge and the world
- 3) An 'approach to ethics' refers to the obligation to respond to others' needs.
- 4) An acceptance of subjectivity as a method of knowing and feelings as elements of knowing
- 5) A desire for and acceptance of complexity
- 6) A willingness and adoption of innovation and flexibility.

### GENDER INTEGRATED APPROACH

Gender role theory holds that traditionally men have done the most productive (paid) work in the public realm, whilst women have been provided a private sphere of 'reproduction', which is unpaid, domestic work and has a significant impact on their risk perception. The goal of this study is to investigate how women perceive risk in public places (Jacobs, 2020). It tackles impediments to women's access to public spaces, as well as the reality that men and women are exposed to different dangers, perceive risks differently, and respond to risks differently. It is an effort to introduce recommendations for architects and planners for the construction of gender-appropriate urban public spaces that would allow women to participate equally in the public realm and contribute to the benefit of society (McDowell, 2013).

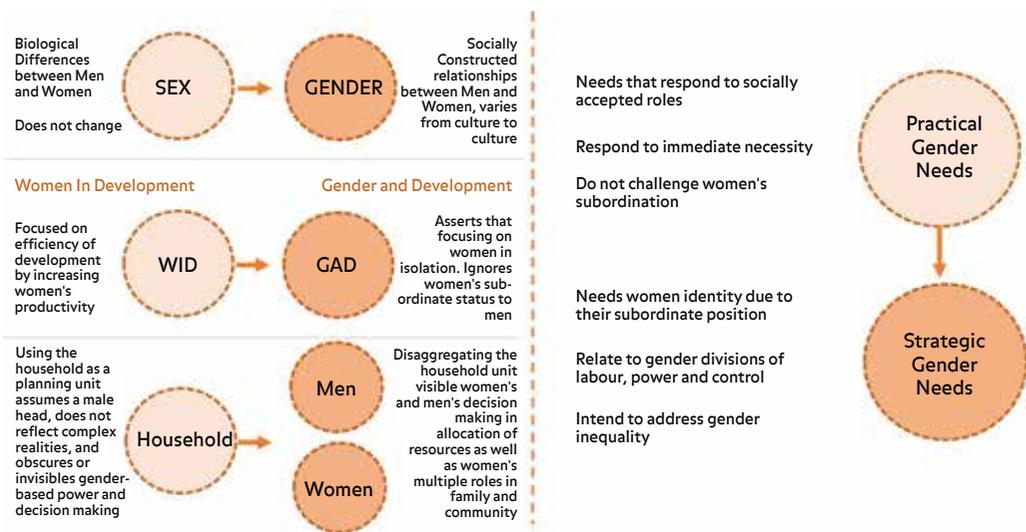


Figure 5: Sex vs. Gender (Source: Author)

The relevance of spatial planning authorities in altering the built environment with the introduction and operation of future development is becoming increasingly apparent (Newman, 1973). Women's needs are not given the same priority as men's in the establishment of such programs, according to studies, and a general, rather than a gendered, approach to mainstreaming dominates. Women's needs and interests as designers and users of the built environment, however, have not been fully incorporated into the development of policies and practices. The female principle is:

- More utilitarian than formal.
- More adaptable than rigid.
- Rather than being abstractly systematized, it's more naturally arranged
- More comprehensive than specialized
- It's more complicated than a one-dimensional model.
- More socially conscious than profit-driven.
- Takes longer to develop than it does to construct.

Feminist notions must be included in designers' academic and employment practices to alleviate historic and institutionalized bias against women (Habib, 2012). What important is if a designer acknowledges the existence and causes of inequality due to gender, understands the unique requirements of women because of this gap and is committed to reforming the current system on a professional standard (Benford & Snow, 2000).

In terms of feminist perspectives, while visible marginalization in the professional industry is declining, women must still 'work harder to exert their power and prove their abilities in an 'all-male' environment' and overcome stigmas associated with females on the construction site, as reflected/reported in the literature. One can tell when their views are being ignored in certain instances. This behaviour is exemplified by the female architect's exclusion from design talks and complaints of sexual misconduct on or around construction sites. The way you dress can frequently determine how seriously you are taken on the job (Steg, 2013).

The inference is that women are much more exposed to assault and harassment, restricting their use and

enjoyment of public spaces in cities. The extent to which ideas about a 'basic', 'essential' or 'biological' sex divide (see figure 5) have been embedded in the constructed world has also been thoroughly explored. According to much of the existing research, urban expansion has been built on traditional notions of masculinity and gender. It has been proposed that these models were based on idealistic gender relationships that had, and still have, dubious universal significance (Bryson, 2016).

**HOW IS DESIGNING AND CREATING SAFE PUBLIC SPACES FOR WOMEN AND GIRLS SIGNIFICANT?**

Because they provide public spaces where women and other users have an equal chance to be healthy, secure and joyful, women's and girls' safety planning and design are essential. According to this kind of planning, the physical layout of cities affects how women use and enjoy the public sphere in the following ways (Massey, 1994) :

- It raises consciousness of the idea that neutral spaces don't exist and that a place's design can either encourage or obstruct women's use, appropriation and welfare of public space.
- It recognizes that gender dynamics between men and women have a significant role in the structuring and growth of urban settings.
- It recognizes that the city exhibits certain social, economic and historical characteristics that are specific to the experiences of local women.
- It recognizes that urban areas reflect the dynamics of power that shape women's and men's behaviour and differences.
- It recognizes that a city's public spaces are often designed around a traditional family concept and a traditional employment division between men and women. It also supports efforts to change the spatial structure to reflect changing gender roles in society.
- It recognizes that women are aware of the places and situations in cities when they feel vulnerable as well as the reasons behind their concerns.
- It recognizes that if women and girls avoid utilizing public areas because they do not feel safe, these spaces will become more insecure for women, girls and other users, and it is a beneficial tool to improve the quality of urban and community life and to minimize women's fear and victimization.

Because of this, it's an excellent instrument for raising everyone's quality of life in cities and communities as well as lowering the fear and victimization of women. In order to create fair and sustainable cities and communities, it promotes women's and girls' rights to the city and citizenship.

### GENDER SENSITIVE PLANNING

Gender-sensitive planning is a new tradition whose goal is to ensure that women through empowering themselves achieve equality and equity with men in developing societies. The linkage between gender dimension and urban development is the subject of gender-sensitive planning.

Its significance stems from the fact that present development policies frequently discriminate against or overlook women, even when they are properly drafted, as a result of erroneous assumptions. The intellectual underpinning for important gender planning concepts may be found in many feminist theories and current discussions on women, gender and development.

Although they may overlap in almost all civilizations, the roles of gender distinction between the biological functions of the feminine and the masculine and define the duties of men and women in:

- social and economic activities
- access to resources
- decision-making authority

Caroline Moser (1993) demonstrates how such concepts are transformed into methodological methods, tools and approaches that are integrated into the planning process based on her considerable research and teaching expertise in gender-sensitive planning. She analyses institutional structures and operational processes to specifically incorporate gender into the project planning cycle, considering whether the execution of gender-sensitive planning is subject to technical or political restrictions.

The entrance points for these groups to advocate for the concerns of women at the domestic, civil society, national and international levels are:

- Identification of gender roles based on the gender roles described above
- Evaluation of gender requirements based on practical gender needs as opposed to strategic gender needs
- Planning for balancing the triple role to avoid unplanned overlaps of gendered tasks
- Disaggregating control of resources and decision-making at the household level to meet conventional assumptions of the family unit
- Intervention options and performance measurements
- Including women and gender-conscious groups in the planning process

### ALTERING THE BUILT ENVIRONMENT

The built environment, as well as cultural norms for behaviour, have an impact on a woman's safety in public settings (Peake, 2020). Women's challenges are becoming more well-known, which may lead to a change in how women are regarded and appreciated in society.

Some key considerations were identified to alter the built environment and contribute to the existing literature:

- To minimize displacements and competition for usage, sufficient open area that may be appropriated should be provided at a reasonable distance.
- A wide range of appropriation and utilization forms should be encouraged.
- Ensure multi-functional use, such as a sports facility.
- Safety is a must-have. Open structures, visual connections to the environment, and supervision can all help to achieve this.
- Different population groups should have access to amenities. They need to be specified explicitly.
- Small-scale structures are required because a dominating, arena-like environment favours gender-specific appropriation.
- In addition, some protected spaces or times are required so that girls, particularly those in early puberty, can realize their full potential without being bothered, such as playing sports away from male gazes.
- While successful public engagement should be self-evident, gender-sensitive participation methods must be implemented.
- More flexibly designed interim usage projects must also be organized with better gender-sensitive considerations.
- Finally, a greater study into the effects of changing gender relations on outdoor behaviour is required.
- Buildings should be created with the human scale in mind. The size of the constructed form should be comparable to that of a user strolling along the street.
- Negative spaces should be avoided at all costs, with the greatest amount of space available for each place. It is best to plan time to avoid sharp, inaccessible corners that are hidden from view.
- Cluster development is preferable. A tight-knit community ensures the safety of all citizens.
- Street culture must be reestablished, since the ancient notion of street assured eyes on the street and continual activity on the sidewalks.
- A strong public transportation network must be established to link diverse locations. It guarantees that individuals may go from one location to another without difficulty, but special emphasis should be given to women to eliminate any travel concerns.

### ACTION RESEARCH PLAN

A recommended analysis (as shown in figure 6) concluded from the review that is evidence-based and addresses the needs of gender-based urban planning dimensions based on data-driven approaches: evaluation of the condition, creation of the action plan, assessment of the plan to assess its efficacy.

- *Evaluation of the condition:* The first phase aims to recognize women's needs by building data collection systems that are gender-segregated. These newly created methods of data collection will involve surveys and societal participation to gather as much information as possible about men and women, as well as how they use urban space. Once enough data is gathered, it will be possible to determine the challenges that men and women face daily in the built environment, as well as how these aspects contribute to inequality.

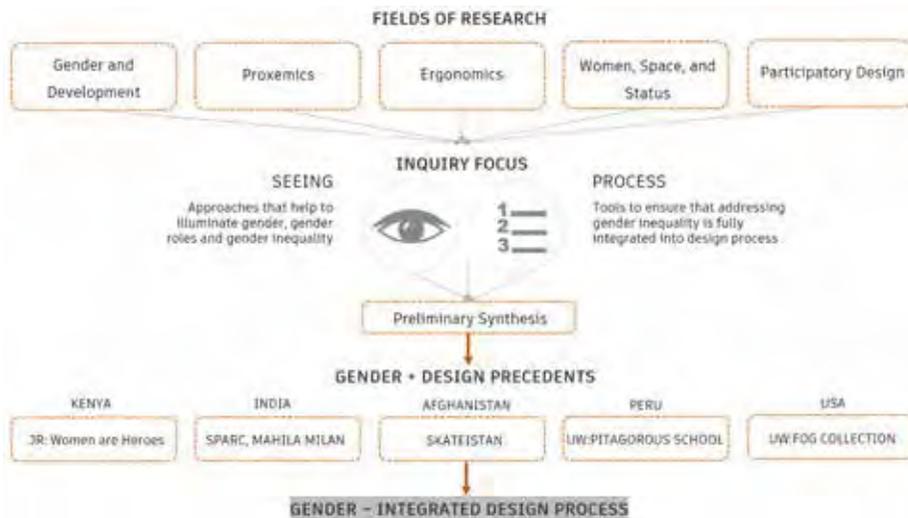


Figure 6: Action Research Plan  
(Source: Author)

- **Creation of the Action Plan:** Phase two involves the formulation of extensive objectives to determine the city's long-term goals after decision-makers have gained a better understanding of the problems and their core causes. Following that, each step's intended results are stated, and result measurement guidelines are created to evaluate the project's outcomes. Each procedure's human and financial resources, as well as the implementation timeline, must be planned on time. The execution timetable is used to assign responsibilities, set a deadline for completion, and guarantee that all stakeholders are kept informed. It's a step-by-step guide to achieving measurable results.

- **Assessment of the Plan:** The third phase is assessing the project's outcomes and efficacy. Understanding the variables that contribute to the barriers to attaining the objectives is critical for analyzing the project's development and application of guidelines. Changes may need to be identified as the project advances to allow for flexible delivery.

- **Review of the Plan:** Data will be evaluated regularly in Phase 4 to assess any changes over time and to comprehend the project's consequences on residents' lives. This will also entail an assessment of the project's principles and long-term goals with stakeholders to ensure the project's efficacy.

## RESULTS AND FINDINGS

Effective gendered public spaces are significantly difficult to accomplish, as their complexity is rarely interpreted or observed. From the scholarly evidence and research, one can conclude various interventions that would be potentially effective in addressing gender-inclusive design:

- **The Community as an Expert**

Identifying the abilities and assets throughout the community is critical when establishing a proposal for any gendered public space. Individuals may provide historical context, useful insights into how regions function, a grasp of critical challenges, and what is meaningful to people in any community. Using the data at the start of the procedure will help to foster community ownership in this project, which will benefit both the project stakeholder and the community.

- **Public Space-making and not Design**

A design is not enough if your purpose is to make a space. To transform an underperforming space into a vital 'place' for everyone, physical elements such as seating with landscaping must be introduced, as well as changes in the pedestrian and vehicular circulation patterns. The development of more intense relations between the surrounding commercial and the activities taking place in the public spaces. The goal is to create a place with a strong feeling of community and a welcoming image that does not discriminate against any segment of society.

- **Have a Vision**

Each community's vision must be developed independently. However, a vision of the type of activities might be there in the space, a view that the area should be comfortable and have an empowering view, and that it should be an essential site where individuals want to be, and it should ingrain a sense of motivation in the people who live-work in the adjacent area are all crucial to perception for any gender-based public space.

- **Triangulate**

Triangulation is a technique in which an external stimulus creates a bond with the people and causes strangers to interact as if they knew each other. For example, if a chair, waste bin and a phone are put separately, they may receive relatively little use, but when combined with other amenities like a juice cart, they will promote human interaction and bring people together (or triangulate). On a larger scale, if a women's centre is positioned next to a park with activities of interest to women, there will be greater activity than if these are put separately.

- **Form and Function**

The concept for the space is based on the input of the community and possible stakeholders, an understanding of how places work, experimentation, overcoming barriers, and sceptics. While the outline of the design is vital, these other factors inform you what 'shape' you'll need to realize the future vision of the space.

- **The Scheme is never Finished**

The characteristics of ideal public places that adapt to the wide public, opinions, and continual changes necessitate attention. In an urban context, amenities wear down but need to be replaced, and other things happen. Ideal public spaces, cities, and towns are built by being open to the demand for change and having the managerial adaptations to implement that idea.

## CONCLUSION

Identifying the skills and resources within the community is crucial when creating a design for any gendered public space. According to the research that has been done thus far, the initial step in developing a gender-inclusive city is getting to know the women and girls who live there and accurately analyzing the requirements, issues and possibilities. Achieving a gender-based transformative change will be made possible by the gathering of gender-sensitive data to address regional imbalances and the political will to address these differences. The concept for a place is created with the help of the community's and possible partners' involvement, knowledge of how spaces work, experimentation, and overcoming challenges. Although the design is crucial, the other components demonstrate what planning level is required to realize a space's long-term goals.

The review suggests that our findings might be applied to evidence-based gender-inclusive urban planning and development and that intersectionality could be used as a promising lens to critically reflect the mysteries and paradoxes of gendered urban identity. These strategies should not be considered as alternatives but, should be complementary and parallel.

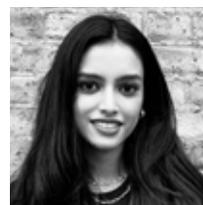
In delivering an evidence-based and comprehensive intervention, this review envisions fair-shared, safe, and sustainable cities with equality for both men and women.

## Acknowledgement

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## REFERENCES

- Andrews, K.; Biggs, M. (2006). The Dynamics of Protest Diffusion: Movement Organizations, Social Networks and News Media in the 1960 Sit-Ins. *American Sociological Review*, 71(5). P. 752-777.
- Benford, R.; Snow, D. (2000). Framing Processes and Social Movements: An Overview and Assessment. *Annual Review of Sociology*, 26(1). P. 611-639.
- Bondi, Liz (1990). *Feminism, Postmodernism, and Geography: Space for Women?* Antipode, Vol. 22, Issue 2. P. 156-167.
- Borden, Iain; Rendell, Jane; Penner, Barbara (2002). *Gender Space Architecture: An Interdisciplinary Introduction*. Taylor and Francis. Retrieved July 15, 2018, from <https://doi.org/10.4324/9780203449127>.
- Brownmiller, Susan. (1975). *Against our Will: Men, Women and Rape*. Secker and Warburg, London.
- Brydon, Lynne; Chant, Sylvia, H. (1989). *Women in the Third World: Gender Issues in Rural and Urban Areas*. Rutgers University Press, New Brunswick, N.J.
- Bryson, Valerie. (Ed.). (2016). *Feminist Political Theory*. Palgrave, London.
- Connell, R.W. (1987). Gender and Power: Society, the Person, and Sexual Politics. *Bulletin of Science, Technology & Society*, Vol. 8, Issue 4, Stanford University Press. P. 445. Retrieved 17 May 2020, from <https://doi.org/10.1177/027046768800800490>
- Connell, R.W. (1995). *Masculinities*. Polity, Cambridge.
- Eisenstein, Hester. (1984). *Contemporary Feminist Thought*. G.K. Hall, Boston.
- Faure, Bernard. (2003). *The Power of Denial: Buddhism, Purity and Gender* (Course Book). Retrieved 4 October 2019, from <https://doi.org/10.1515/9781400825615>.
- Franck, Karen A. (1999). A Feminist Approach to Architecture: Acknowledging Women's Ways of Knowing in *Gender Space Architecture*. Routledge, New York. P. 311-321. Retrieved 06 January 2021, from <https://doi.org/10.4324/9780203449127-40>.
- Goldsmith, B.; Beresford, M. (2018). *India most dangerous country for women with sexual violence rife - global poll*. Thomson Reuters Foundation. Retrieved 15 May 2021, from <https://www.reuters.com/article/women-dangerous-poll-idINKBN1JM076>.
- Greed, Clara. (1994). *Women and Planning: Creating Gendered Realities*. Routledge, New York.
- Habib, Rima, R; Messing, Karen. (2012). Gender, Women's Work and Ergonomics. *Ergonomics*, 55(2), 129-132. Retrieved January 24, 2022 <https://doi.org/10.1080/00140139.2011.646322>.
- Hoggart, K.; Morgan, W.B.; William B. (1992). *Agricultural Change, Environment and Economy: Essays in Honour of W.B. Morgan*, Edited by Keith Hoggart. Mansell, London.
- Jacobs, Jane. (2020). *The Death and Life of Great American Cities*. Jonathan Cape, London, UK.
- Jones, Susan R. (2016) Evolution of Student Development Theory. *New Directions for Student Services*. P. 17-28. Retrieved 30 February 2021, from <https://doi.org/10.1002/ss.20172>.
- Little, K. (1980). Explanation and Individual Lives: A Reconsideration of Life Writing in Anthropology. *Dialectical Anthropology*, Vol. 5, Issue 3, P. 215-226. Retrieved 13 January 2020, from <https://doi.org/10.1007/BF00257768>
- Mac an Ghaill, Máirtín. (1994). Review Work: The making of Men: Masculinities, Sexualities and Schooling: Review Symposium. *British Journal of Sociology of Education*, Vol. 17, Issue 4. P. 509-520.
- Massey, Doreen B. (1994). *Space, Place and Gender*. Polity P., Cambridge.
- McDowell. (2013). Working Lives: Gender, Migration and Employment in Britain, 1945-2007, *Working Lives* (First edition). John Wiley & Sons, Incorporated. Retrieved October 19, 2020 from <https://doi.org/10.1002/9781118349229>.
- Meyer, I.H. (1995). Minority Stress and Mental Health in Gay Men. *Journal of Health and Social Behavior*, Vol. 36, Issue 1, p. 38-56. Retrieved 24 January 2020, from <https://doi.org/10.2307/2137286>.
- Moser, Caroline O.N. (1993). *Gender Planning and Development: Theory, Practice, and Training*. Routledge, London.
- Negami, H.; Mazumder, R.; Reardon, M.; Ellard, C. (2018). Field Analysis of Psychological Effects of Urban Design: A Case Study in Vancouver. *Cities & Health*, 2(2), p. 106-115.
- Newman, Oscar. (1973). *Defensible Space: People and Design in the Violent City*. Architectural Press, London.
- Peake. (2020). Gender and the City. *Encyclopedia of Human Geography* (Second Edition, pp. 281-292). Elsevier Ltd. Retrieved February 6, 2022 from <https://doi.org/10.1016/B978-0-08-102295-5.10186-6>.
- Proshansky, Harold M., et al. (Eds.) (1970). *Environmental Psychology: Man and his Physical Setting*. Holt, Rinehart & Winston, New York.
- Segal, Lynne. (1990). *Slow Motion: Changing Masculinities, Changing Men*. Rutgers University Press, New Brunswick, N.J.
- Robinson, Brandon Andrew (2005). *Outed and Outside: The Lives of LGBTQ Youth Experiencing Homelessness*. Retrieved 6 October 2017, from <https://repositories.lib.utexas.edu/handle/2152/623382>.
- Steg, Linda, et al. (2013). *Environmental Psychology: An Introduction*. BPS Blackwell, Oxford.
- Tripathi, Kusum. (1996). The Need for Gender Analysis in Strategic Planning for Effective Water Management in Sri Lanka. *International Journal of Water Resources Development*, Vol. 12, Issue 4. P. 447-460. Retrieved 7 July 2019, from <https://doi.org/10.1080/07900629650051>.
- Warren, Howard C. (1922). *Elements of Human Psychology*. Houghton Mifflin Company, New York.
- Wieser, Clemens. (2019) Reflections on Ethnographic Work in Political Science. *Annual Review of Political Science*, Vol. 13, Issue 1. P. 255-272. Retrieved 10 July February 2019, from <https://doi.org/10.1146/annurev.polisci.11.052706.123951>.
- Whitzman, C. et al (Eds.). (2013). *Building Inclusive Cities: Women's Safety and the Right to the City*. Routledge, New York.



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# THE UNSPECIFIED ARCHITECTURAL HARMONY BETWEEN JEWISH TEMPLES AND DRAVIDIAN HINDU TEMPLES



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**ABSTRACT**

As a city, Jerusalem has been at war continually and has faced conflicts, invasions and the highest number of attacks throughout its history. Being one of the oldest and most congested cities in the world, Jerusalem is revered as a sacred city to three major Abrahamic religions: Jews, Muslims and Christians. The Solomon Temple, popularly called the 'Temple of Jerusalem', is one of the oldest temples and a crown jewel of the city has been the centre of Judaism both physically and spiritually. Generally, nations seek others that share a similar history, cherished values, common religious bonds or similar interests. One question that arises is whether Israel and India share history or similarities in any field? Is there a noticeable architectural harmony that exists between Solomon's temple in Jerusalem and Hindu temples in south India? This paper uses literature and comparative analysis method, to identify the similarities and differences between the above two temples with respect to the syncretism in architecture and their respective spatial understandings. Historians generally agree that great stimulus can be found in studying historical evidence that links disparate cultures together over time and space. Though the timeline of the origin varies, the architectural similarities and resemblance of the spiritual purpose of spaces and elements are difficult to be ignored. There are a number of plausible and interesting conjectures like the basic plan, height differences for each space in these temples and the exterior spaces within the temple compound that offer useful starting points for investigating the connection that exists between architectural forms. Is it a coincidence or is it an influence? Plan of the divine? This paper might not give the right answer as to how this was possible but it does spark a theory or a question followed by research in that direction.

**Keywords:** Solomon's temple, Hindu temples, Syncretism, History, Literature, Spatial study

**INTRODUCTION**

Israel is a country which houses one of the oldest temples in the world called the Dome of the Rock. According to the Archaeological Survey, the mosque which exists now was originally the site of the Jewish temple in circa 832 BCE which was constructed by King Solomon. This site is greatly revered for its significance for the Abrahamic religions - Jews, Muslims and Christians. This recognition for this temple was also a cause for constant fighting to capture and ownership. In addition, Israel has seen a constant shift in power

since the beginning of time and only a few decades ago the country went back to its original ethnic inhabitants. In spite of being 4500 km apart, the two nations have witnessed the rise and fall of a number of dynasties and empires before independence. Though both the nations have a unique cultural heritage and history, they share a special closeness in terms of observing the lunar calendars and all the festivals they celebrate fall on the same dates (Narayan, S., 2016). In addition, Hindu and Jewish ritual objects are very similar, like lamps and incense, and several others.

**RESEARCH QUESTION**

To compare the two temples - Solomon Temple in Jerusalem, Israel and Brihadeeswarar Temple in Thanjavur, India- to see whether there are notable parallels with respect to architectural planning concepts and their architectural styles.

**SCOPE OF THIS STUDY**

This study will especially be of interest to historians and professionals involved in heritage and religious fields. It can be used by researchers to support their existing hypotheses around similar topics which try to link Israel and India in any cultural or religious way. Moreover, studying history allows us to observe and understand how people and societies behaved and deepen the appreciation of design and serve as a basis to foster creative energies. Since the authors hail from Tamil Nadu, they wanted to limit their comparative study to this temple.

**METHODOLOGY**

The comparative analysis makes up the majority of the exploratory research in this study. Most of these similarities are applicable to these two main temples. The Jewish temple would be King Solomon's temple and the Hindu Dravidian temple is the Brihadeeswarar temple.

**HISTORY OF JUDAISM AND THE BIRTH OF JEWISH TEMPLES**

Judaism is commonly considered the father of the three Abrahamic religions. It is a monotheistic religion where the followers believe in the existence of only one god whose name is Jehovah. This religion originated in

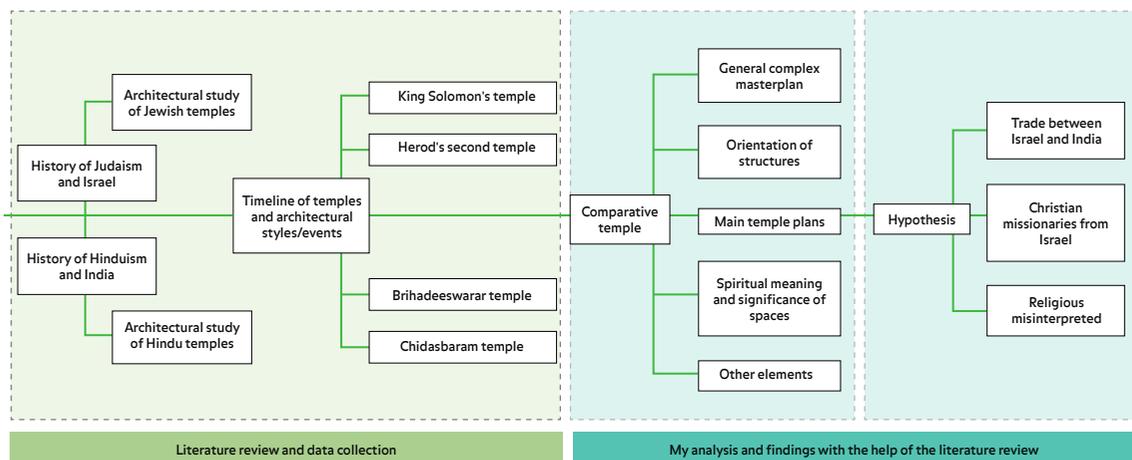


Figure 1: Methodology chart (Source : Authors)





Figure 4: Brihadeeswarar temple (Source: <https://unsplash.com/s/photos/tanjore-big-temple>)

**THE GENERAL COMPLEX MASTERPLANS**

Apart from the orientation, these temple structures are similar in a number of other aspects also. The analysis starts with comparing the two temples and their general masterplans with their structural elements:

- **The Compound :** Both portray a rectangular external plan. The later iterations of Solomon’s temple – Herod’s temple and the ones in between, had extra courtyards and rooms being added but nevertheless, the final masterplan remained rectangular in shape. The orientation of this rectangular compound (Fig.6) is also identical with the shorter sides being perpendicular to the east-west directional axis and the longer sides being perpendicular to the north-south axis.

- **The Temple Location :** The location of the main temple inside these compounds and temple grounds are also similar (Fig.7). They are located closer to the rear end wall, near the west side, and there is a small gap left between the rear end wall or the west wall and the temple wall for circulation. These distances are also comparatively similar in proportion to the length of the compound wall. The Brihadeeswarar temple is bigger in scale compared to Solomon’s temple, however, the distance between the temple and the west wall is similar in proportion for both of these structures.

- **Mandaps and Altars :** The temple complexes also have other smaller structures apart from the main temple in the middle. One such notable structure in both these temples is the square podium exactly in front of the entrance of the temple. This podium is called the Nandi mandap in Brihadeeswarar temple and in Solomon’s temple and its later designs it was the sacrificial altar (Fig.8). Just as the distance between the west rear end wall and temple wall was proportionally similar, this structure (mandap and altar) is also dimensionally proportionate to each other. Apart from its own dimensions, the location of this structure is also alike in both temples.

- **Location of Columns :** In most Hindu temples’ columns are seen in a mandap or placed in a long narrow colonnade (UNESCO, 2004). In king Solomon’s temple, we can see columns placed along the compound walls (Fig.9). In most Hindu temples today, a similar colonnade can be observed along the peripheral compound walls.

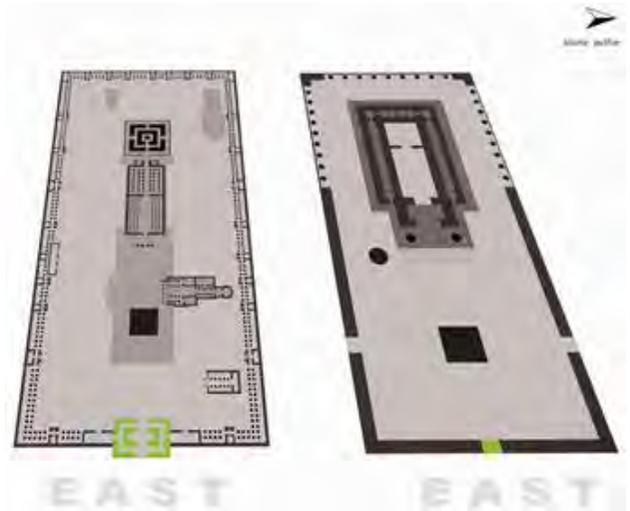


Figure 5: Orientation of temples (gates in green) (Source: Authors)

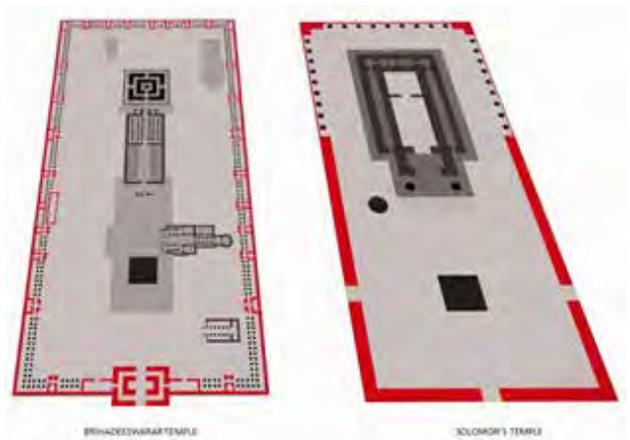


Figure 6: Compound walls (shown in red) (Source: Authors)

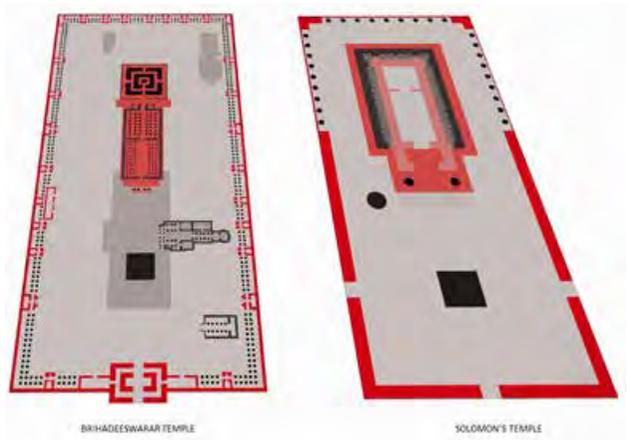


Figure 7: Location of temple (Source: Authors)

- **Circulation Pattern :** With the support of the aforementioned similarities, it becomes much evident that with these structures and their locations being very alike, the circulation pattern for users in both these religious temples is mostly the same. Apart from just the physical location of the structure on the ground (XY plane), most of these structures are similar in heights and massing also (XYZ plane). In conclusion, even the feel and visual of circulation (Fig.10) are similar for both these temple styles.

- **The Steps :** Both Solomon’s temple and the Brihadeeswarar temple are at a certain height above the rest of the structures in the temple complex. Therefore, there is a flight of steps between the temple grounds and the temple porch in both these structures (Fig.11). The stairs, in both these cases are always rectangular in shape, going along with the style of the temple planning.

- **The Artha Mandapa and the Porch/ Vestibule :** After the staircase, one enters the artha mandapa in Hindu temples (Fig.12). In the case of a Jewish temple, the space entered after the stairs is called the vestibule or the porch in general terms. This space is the official entrance of the temple where the user gets mentally prepared to enter the holy place of worship. These spaces in both religious contexts do not have any extra elements or ornamentations in them. These are simply plain open spaces.

- **The Mandapa and the Holy Place:** Following the porch or the artha mandapa is the main mandapa, also called the pillared mandapa in many temples like the Brihadeeswarar temple, and the holy place in Jewish temples (Fig. 13). This is the longest space in the temple in comparison to the other named sectional spaces. This main mandap or the holy place is where people can stand and worship the deity. This is also where the priests stand to perform the rituals before God who is said to reside in the garbhagriha or the oracle. This space also contains some other elements unlike the other spaces and these elements and their purposes are also very alike.

There are lamps or menorahs which burn with oil and wicks in various places to light up the temple. There is use of agarbati and censers or incense burners to purify the air. In Jewish temples and some Hindu temples there are also special tables to offer sacrificial food offering to the deity. In Hindu temples, this mandap mostly has a lot of ornated pillars which depict Hindu stories and mythologies. The initial Jewish temple built by King Solomon did not have pillars in it, however, the later design iteration by king Herod has a few non-structural columns inside the holy place.

- **The Garbhagriha and the Oracle/ Holy of Holies:** This space is the most important space in the entire temple complex. This is smaller in size compared to the mandap and the holy place and it is called the ‘garbhagriha’ in Hindu temples and the ‘oracle’ or the ‘holy of holies’ in Jewish temples (Fig.14). This holy space is very compact and cubical in design. It is also designed in such a way that no natural light enters the garbhagriha or the oracle. This is one of the reasons why lamps are used to illuminate these spaces (Sivaramamurti., 2006). Another thing that is common here is that no common man or woman is allowed to enter the oracle or garbhagriha. Only the priest is allowed access to these spaces. Even the priest has certain rules and restrictions when it comes to this space, like being allowed to enter only while offering prayers or performing rituals. There is also a striking cultural similarity here where the priest in most of these

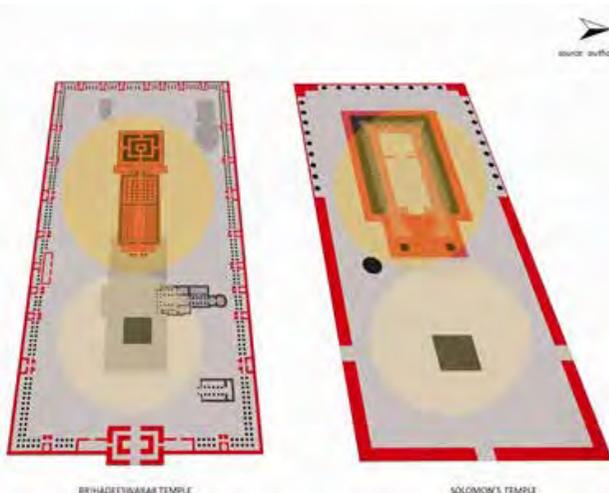


Figure 8: Location of Mandaps and altars (shown in red) (Source: Authors)

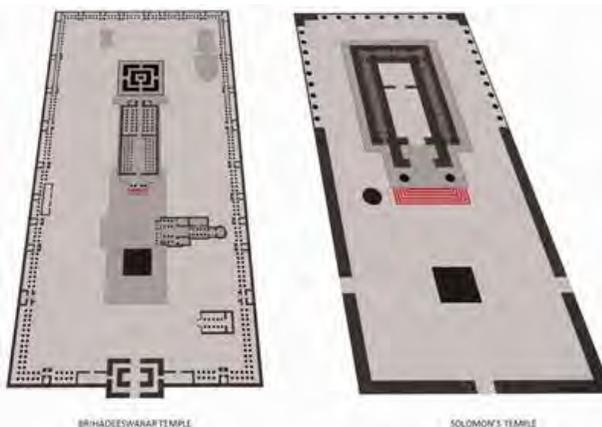


Figure 9: Location of columns (shown in red) (Source: Authors)

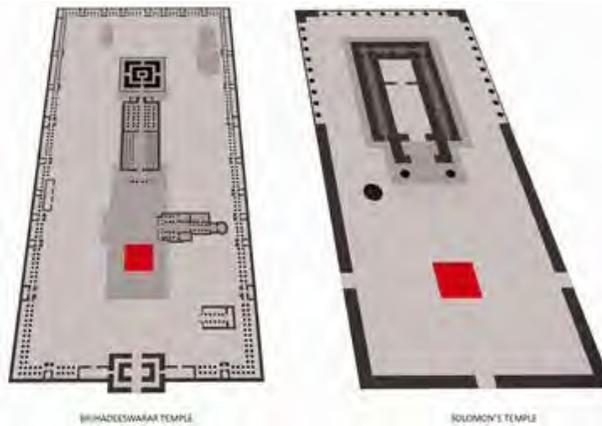


Figure 10: Circulation patterns (circles) (Source: Authors)

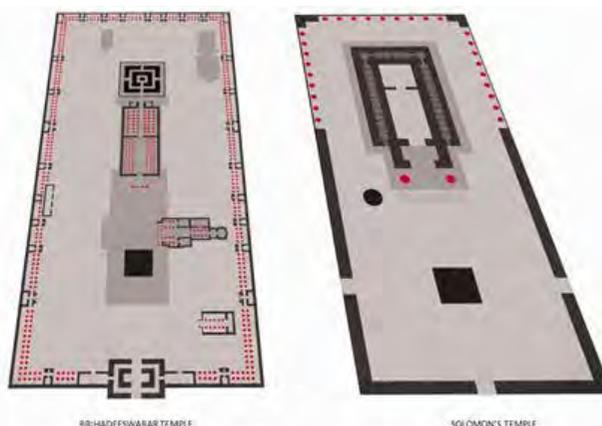


Figure 11: Steps (shown in red) (Source: Authors)

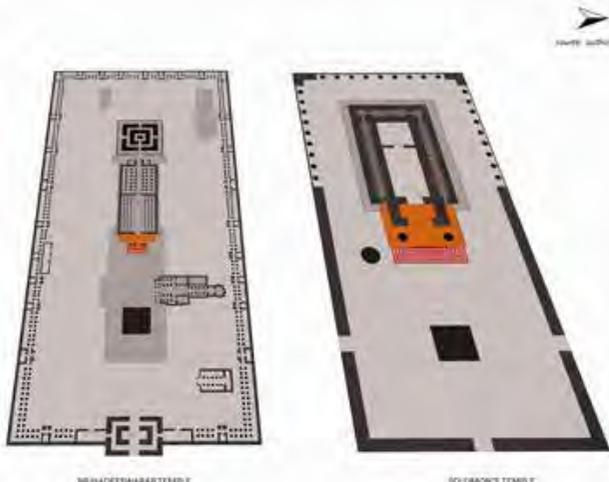


Figure 12: Arthamandapa and the porch or vestibule (shown in orange)  
(Source: Authors)

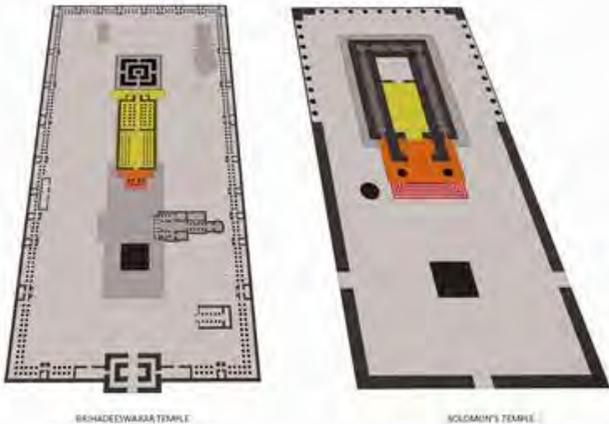


Figure 13: The Mandapa and the holy place (shown in yellow)  
(Source: Authors)

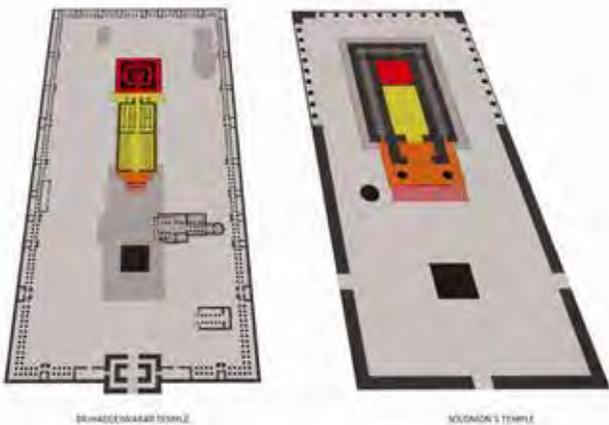


Figure 14: The Garbhagriha and the oracle or Holy of Holies (shown in red)  
(Source: Authors)

temples (according to historical traditions) must come from a certain social class or background by birth. This class is named Brahmins in Hindu culture in India and they are called Levites or people from the tribe of Levi (Levi's descendants) in Israel and Judaism.

Hindu temples have an idol as a deity inside the garbhagriha. This space is similar to what one can see inside the oracle in any general Jewish temple. Only the main Jewish temple (Solomon's temples and its later design models) contains the ark of the covenant inside

it with cherubs flanking it on either side. The other Jewish temples only have a veil separating the oracle from the holy place or the threshold. This is similar to the Hindu temple of Nataraja temple in Chidambaram. There is no idol in the garbhagriha and it is an empty dark space, separated from the mandap with a veil. This is called 'Chidambara Rahasyam' in Tamil, which translates to 'the secret of Chidambaram temple' (Holy Dham, n.d.). However today there is an idol of the dance God Nataraja that rests in the garbhagriha.

- **Other Elements:** With so many striking and subtle similarities between the two different religious temples, and in general other temples belonging to that religion too and more miscellaneous similarities that were observed and analyzed during the exploratory study (Reddy, 2013), like understanding the senses of the user in both these spaces and how architecture and certain elements impact the users' sensory experience in the temples. Some of these have been listed in the following paragraphs.

- **Role of Light and the Use of Fire :** Since the garbhagriha and the holy of holies are enclosed spaces, they have also been deliberately designed in such a way to make sure no natural light or air enters these spaces (Vanmikanathan, 1971). Therefore, the only source of light here is the use of lamps. Hindus use pooja lamps, which are commonly called the panchadiyas or 'five wicks' (Fig.15). They use regular smaller lamps also. In Jewish temples, the menorah is used, which is a lampstand with seven light stands or wicks. There are also separate torch stands that are used to light up the holy place since even that is enclosed in Jewish temples. With the study of the use of fire, one can also conclude that these spaces once entered will have a certain high level of illumination or brightness. It also has the possibility to make the user feel warmer once they enter the temple and the temperature keeps rising as one keeps moving towards the end passing through each increasing level or section of importance, to where the oracle is, which would technically be the warmest due to the high use of lamps there.

- **Smell and Olfactory Senses :** Apart from visual senses and thermo-reception, another similar sensory experiment that is common for both these religious temples is the olfactory one. In Hindu temples, before the garbhagriha or an altar, there is the use of incense sticks or commonly called agarbati made of fragrant spices and flowers. Similarly, in Jewish temples, there was a separate altar called the altar of incense where different types of fragrant spices were burnt for a pleasant smell at the threshold which would be pleasing to the god residing in the holy of holies or the oracle (William & Peterson, 2016). Apart from the altar of incense, Jewish priests also use censers with the different fragrant elements inside burnt and the smoke it releases around the threshold, is carried and swung around in the censer by the priests. This ritual is to those performed by the Hindu priests where they hold a bowl-like vessel with a handle, and similar elements are burnt inside, causing the smoke to rise before the garbhagriha. Another interesting thing to note is

COMPARATIVE ANALYSIS  
THE SENSES: **OLFACTORY**



Menorah in Jewish temples and pooja lamps in Hindu temples

Figure 15: Role of light in temples (Source: <https://unsplash.com/s/photos/altar-of-incense-tabernacle>)



Dhhoop or agarbati in temples

Censer or incense burner in Jewish temples

Figure 16: Smell and Olfactory sense (Source: <https://unsplash.com/photos/jowBIJC165U>)

that, in both these religious temples, the resin named benzoin (sambrani) is used for its fragrance and smoke (Fig.16). The olfactory sense plays an important role in one's experience of the space as the intensity of the smell increases as one proceeds from the outer realm to the inner realm of the garbhagriha. It is believed that odour-evoked memories tend to have high-intensity stimuli than visual imagery.

• **Sounds in the Temple** : Performing rituals before the garbhagriha or the oracle, as mentioned previously, used lamps, incense burners and another important element related to the sound aspect– bells (Fig.17). In Hindu temples bells are used as a ritual object. They are rung while offering prayers. In Jewish temples, bells are also present but not as separate entities- rather they are hung in the garments of the priest (Bharne & Krusche., 2014). Thus, the priest going in to offer prayers, moving around the sanctuary, would make the bells in his garment ring, which would indicate to the common people in the surroundings that the priest was offering prayers inside the oracle. However, the main reason to place bells in their garments was not to please God, rather it served a safety purpose. The priests in the Jewish temples, generally tie themselves to a rope connected to the holy place outside the oracle, as a safety measure, in case they face Jehovah's wrath inside



Figure 17: Bells used in differently in the two temples (Source: Emmock, 2017)

his dwelling. However, in the case of Hindu temples, it is a ritual which merely indicated that prayers are being offered and after that people or priests ring the bell, which in a way psychologically brings a feeling of inner peace to the people who indulge themselves in prayers.

• **The Threshold** : All the aforementioned rituals, of lighting lamps, offering sacrifices, offering fragrant incense and other such rituals are done by the priests alone and there is a specific place in the temple where these rituals take place. This is exactly in-between the garbhagriha and the mandap in Hindu temples and it is in between the oracle and the holy place in Jewish temples. In general terms, one can call this space the 'threshold' (Fig.18) and these rituals are not done in any other space in the temple apart from this one, which is again a similarity to note.

• **Water Bodies inside the Complex** : A few bigger-scale temples in south India have stepped pools inside them. These are present for purification baths before any important pooja or rituals. Similarly in Jewish temples, there were certain pools present around the compound walls. The first temple built by King Solomon did not have any pools in it, but it did have a huge water basin, called the 'sea of bronze' which contained water. And the purpose of this water was the same, for cleansing before entering the temple of prayers. Apart from the sea of bronze, there were also smaller basins with water on wheels for people to use before and after entering the temple. In King Herod's design, there were bigger pools of water designed around the temple compound. Some of the well-known pools were Bethesda and Siloam, for people to fully immerse themselves in for healing and cleansing, just as Hindu temple pools are used today (Pratico G. D., 1985).

• **The Bull** : This was a decorative element in the Jewish side of the analysis, where the temple had bulls made of cast bronze. The sea of bronze that carried water was supported by 12 bronze bulls (Fig. 19a & b) carrying the large basin. In Hindu temples and cultures, the bull is worshipped as a deity named Nandi. Looking at the temple of Brihadeeswarar, we can see a separate mandap dedicated to Nandi, which, as mentioned earlier, is located proportionally in the same location as the altar in Jewish temples. The altar in Jewish temples was used to make sacrifices to Jehovah, which in most cases had to be bulls (bigger the ritual, bigger the sacrifice, and

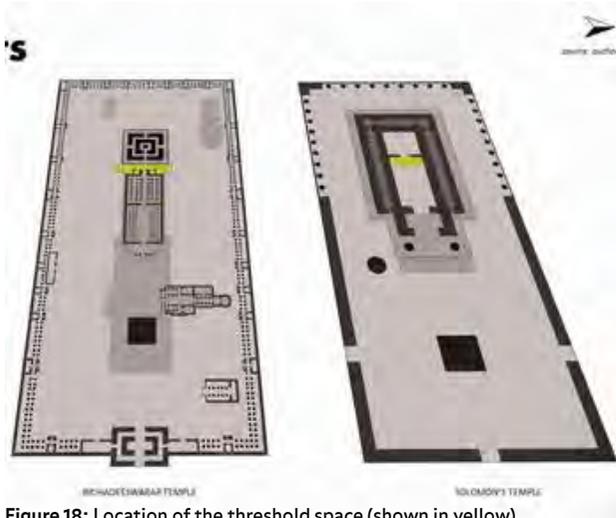


Figure 18: Location of the threshold space (shown in yellow)  
(Source: Authors)



a) Nandi in Brihadeshwarar Temple  
(Source: <https://www.google.com/search?q=un-splash+pic-tures+nandi+at+bri-hadeeshwarar&tb-m=isch&source=i-u&ictx=1&vet=1&fir=KBiXaGd-MOD7hAM%252C-jfQ2bbN5ZhZ>)



b) Sea of Bronze in Solomon's Temple  
(Source: <https://hermeneutics.stackexchange.com/questions/34023/in-1-kings-725-do-the-oxen-represent-the-foundations-of-the-earth>)

Figure 19: Bull used in the temples

bulls were prioritized) though the concept is not the same, the use of the same animal in the same location though for different purposes in both the temples is a notable parallel.

### POSSIBLE THEORIES OF WHY THIS SIMILARITY COULD BE POSSIBLE

The similarities studied and observed between the temples of these two religions are very difficult to be ignored just as a coincidence. With further studies and research on how the respective countries India and Israel could have been possibly related in any way in history, a few notable points brought about the question of could these similarities have some logic behind them. These few facts can be delivered as a hypothesis to prove the similarities between Dravidian Hindu temples and Jewish temples.

- **Trade between Israel and India :** King Solomon who built the first Jewish temple, is said to have brought a lot of precious stones and gold from a place called Ophir, which is a port region mentioned in the Bible, famous for its wealth. King Solomon received a cargo from Ophir every three years which consisted of gold, silver, sandalwood, pearls, ivory, apes and peacocks. Some of Ophir's theorized locations according to historians and scholars are India (present-day Kerala and Tamil Nadu or Gujarat), Sri Lanka, Africa (Zimbabwe or Tunisia), Solomon Islands, Philippines. Since Ophir has the highest possibility of being south India (Fernando, n.d.), there could have been a possible exchange of goods along with ideas, both religious and architectural to bring about such detailed similarities that we see today in these two temples.

- **Religious Misinterpretation :** This hypothesis is a very farfetched one, but this is something many historians and religious scholars are working on currently. The

similarities in the religion and the cultural practices of Hindus and Jews are being studied and analysed in many places today. Some of the notable similarities in said culture and traditions are that both the Jewish and the Hindu calendars are lunar. Most of the festivals celebrated on both sides fall on the same dates. Both Jews and Hindus perform marriage under a canopy. Before entering temples, one has to remove all footwear in both these religions, as it becomes holy ground. In both these cultures, before entering the temple people can have ritual baths before special or auspicious occasions. In both Hinduism and Judaism women during the days of the menstrual period and after childbirth are not allowed to enter temples, they are preferred to be at home or in isolation, away from performing religious activities. This is something that is followed even today in the 21st century in both these religions. Hindus and Jews follow similar death rites. The first Jewish commandment says, "I am the Lord." One of the basic tenets of Hinduism is "Aham Brahma Asmi," or "I am the Creator" and both these are pretty much similar in context. Hindu and Jewish ritual objects are very similar as mentioned previously like the lamps being used, type of materials and incense too (Praver, 1963). The use of semi-precious and precious stones. Hindus use nine of these stones and they are collectively called 'navaratnam'. Jews use twelve of these stones which represent the twelve tribes of Israel. The six-pointed star of David, which is also visible in the flag of Israel is a sacred Hindu symbol also. The original name of Abraham was Av ram which loosely translates to father of Ram in Hebrew. There will be even more similarities in other aspects which need to be explored in further research.

- **Early Missionaries from Israel :** Saint Thomas was one of Jesus Christ's twelve disciples who lived in Israel during the construction of Herod's temple. He travelled

to India to preach the Christian gospel. Saint Thomas is said to have arrived at the shore of the Arabian sea in present-day Kerala and travelled all around south India which is today's Kerala and Tamil Nadu, where we see predominant Dravidian architecture. History archives tell us that St. Thomas arrived in India circa 52 CE (Bhatti, W., n.d.). People worshipped anthropomorphic deities and natural elements (Seeniraj & Paranthaman. 2020). There is a possibility that Thomas could have been an influence in one way to spark the similar ideology in Hinduism today, since Christianity is also literally a half of Judaism and also a major Abrahamic religion.

## CONCLUSION

From the above descriptive analysis it is very evident that these two religious building principles have common traits. More than a solid conclusion, this research also ends in a hypothesis questioning that what could be an influence for the similarities which existed in terms of syncretism in architecture and their respective spatial understandings. Is it because of Christian missionaries, or the trade routes in early days, or is it just plain coincidence? Only further studies and research will give us answers for this question.

## REFERENCES

1. Anat, G.; Mukherji, Anuradha. (2006). *The Holy Darkness: a Study of Light in Brihadeshvara Hindu Temple, Tanjore, Tamilnadu, India*. 425-428: SIGraDI 2006, Arte y Clutura. pp. 425-428.
2. Balasubrahmanyam, P.R. (1971). *Early Chola temples: Parantaka I to Rajaraja I, 907-985 AD*. Orient Longman Publications, Bombay.
3. Bernardini, P.; Fiering, N. (2001). *The Jews and the Expansion of Europe to the West, 1450 to 1800*. Berghahn Books, New York, Oxford.
4. Bharne, V.; Krusche, K. (2014). *Rediscovering the Hindu Temple: The Sacred Architecture and Urbanism of India*. Cambridge Scholars Publishing, UK.
5. Bhatti, Wajid (n.d.). *Saint Thomas in Taxila*, M. Phil. Report, Quaid-i-Azam University, Islamabad. Taxila Institute of Asian Civilizations (TIAC), Islamabad, Pakistan. Retrieved in 2022 from [https://www.academia.edu/31006742/Saint\\_Thomas\\_in\\_Taxila](https://www.academia.edu/31006742/Saint_Thomas_in_Taxila), p.4.
6. Emmock. (2017, October 5). *Emmock's Blog*. Retrieved July 21, 2021, from Bible Bog 2103: <https://emmock.com/2017/10/05/bible-blog-2103/>
7. Fernando, T.V. Antony Raj. (n.d.) The Paravars: Chapter 2- The Jewish Lore. *Heritage Vembaru*. Retrieved on 14 July 2022 from <https://webcache.googleusercontent.com/search?q=cache:O0valntnGPAJ:https://www.heritagevembaru.in/2018/04/the-paravars-chapter-2-jewish-lore.html+%c-d=11&hl=en&ct=clnk&gl=in>.
8. Garfinkel, Y.; Mumcuoglu, M. (2019). *The Temple of Solomon in Iron Age Context*. Institute of Archaeology, The Hebrew University of Jerusalem, Israel.
9. Holy Dham (n.d.). *Holy Dham, Information about the Various Holy Places in India* Retrieved on 14 July 2022 from <https://www.holydham.com/the-chidambara-rahasiyam/>.
10. Michell, George. (2008). *Architecture and Art of Southern India*. Cambridge University Press, Cambridge. P. 16-21, 89-91.
11. Narayan, Shoba (2016), *The Possible link between Judaism and Hinduism*. Retrieved on 14 July 2022 from <https://www.livemint.com/Sundayapp/EOi0ienO9G7lm8G1dM6SpN/The-possible-links-between-Jews-and-Hindus.html>.
12. Robinson, Ira. (1989). Kabbala and Science, in "Sefer Ha-Berit:" A Modernization Strategy for Orthodox Jews. *Modern Judaism*, Vol. 9, Issue 3, p. 275-288. Accessed in 2022 from <http://www.jstor.org/stable/1396176>.
13. Herzog, Zeev. (2000). The Temple of Solomon: Its Plan and Archaeological Background. *Yad Izhak Ben-Zvi*, Jerusalem. p. 155-74.
14. Kitchen, K.; Handy, L. (1997). *The Age of Solomon: Scholarship at the Turn of the Millennium*. Brill Academic Publications, Leiden & New York. p. 144.
15. Pratico, G.D.P. (1985). Nelson Glueck's 1938-1940 Excavations at Tell el-Kheleifah: A Reappraisal. *BASOR*, The Semitic Museum, Harvard University. p. 1-32.
16. Praver. (1963). *A History of the Latin Kingdom of Jerusalem, I-II, Jerusalem*. Bialik Institute, Jerusalem.
17. Romm, James. (2001) *Biblical History and the Americas: The Legend of Solomon's Ophir, 1492-1591. Jews and the Expansion of Europe to the West, 1450-1800*. Ed. Paolo Bernadini and Norman Fiering. Berghahn Books, Oxford.
18. Reddy, G. (2013). Alayam - The Hindu temple - An epitome of Hindu Culture. *Sri Ramakrishna Math Report, Mylapore*. P. 31.
19. Seeniraj A.; Paranthaman, G. (2020). Religion of Sangam People. *Wutan Huatan Jisuan Jishu*, Vol. XVI, Issue VI, Retrieved in 2022 from <http://whttsjs.cn/gallery/13-whjj-june%20-5447.pdf>.
20. Sivaramamurti, C. (2006). *The Great Chola Temples: Thanjavur, Gangaikondacholapuram, Darasuram*. Archaeological Survey of India (ASI), New Delhi. P. 20-26.
21. UNESCO (2004). *Great Living Chola Temples*. UNESCO World Heritage List. World Heritage Centre. Retrieved on 2 April, 2022, from: <https://whc.unesco.org/en/list/250/#:~:text=All%20three%20temples%2C%20the%20Brihadisvara,at%20Darasuram%2C%20are%20living%20temples>.
22. Vanmikanathan, G. (1971). *Pathway to God through Tamil Literature*. Delhi Tamil Sangam Publication, Chennai.
23. William, H.; Peterson, D. (2016). Similarities in Hebrew and Hindu high places. *the Desert News*, Utah.



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# INVESTIGATING THE FACTORS INCREASING PLACE ATTACHMENT OF CHILDREN WITH AUTISM IN OUTDOOR REHABILITATION CENTRES

30



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## ABSTRACT

*Autism spectrum disorder is a neurological disorder characterized by impaired social interaction and communication with stereotyped and repetitive behaviours. Due to their different perceptions of the environment, designing a suitable space as a rehabilitation centre that causes place attachment is an important issue for them. The term 'attachment to a place' indicates the emotional impact of a place to which people are emotionally and culturally attracted. The purpose of this study was to investigate the factors that increase attachment to the location of autistic children in outdoor rehabilitation centres. In this study, which was conducted by secondary and primary methods, 200 parents of autistic children were surveyed using a questionnaire made by the researcher. After identifying the factors by performing heuristic factor analysis, the agents were named. Thus, the first factor is determined as the spatial perception caused by sight, the second factor as the use of the sense of smell, the third factor as the use of the sense of taste, the fourth factor as the stimulation and touch pleasure and the fifth factor as the use of the sense of hearing. According to the research findings, it could be suggested that the most important factor in place attachment in these children is the spatial perception factor resulting from the visual activity, which covers 14.30% of the total score of place attachment.*

**Keywords:** *Autism, Open space, Rehabilitation centre, Architecture, Attachment to place.*

## 1. INTRODUCTION

### 1.1 Background

Architecture as a profession is responsible to create and arrange a place to fulfil the need of all the clients. People with special needs (exceptional children) shouldn't be denied such fulfilment, although it may happen one way or another. Unfortunately, architects do not have any specific standards and structural and physical principles for rehabilitation centres for autism patients, and there has not been much research done on this area yet. Special treatment and educational places for these children are considered in just a few countries such as the U.S.A and Germany, but in Iran, because of not enough understanding of autism, there are only one or two nonstandard educational centres in Tehran, that are made by changing the usage of buildings. These are not answerable to these children's needs at all, and in the other cities are without any facilitation. Hence, this research aims to analyze the factors that could increase the place attachment of children with autism in outdoor rehabilitation centres. With this same title, the main question of the essay is posed in which one of the first senses can increase the attachment to the location of children with autism in outdoor rehabilitation centres. Our research method in this essay is based on secondary and primary studies during which information about children with autism was sought. To do so, the collection of the data has been done through a questionnaire made by Mode Questionnaire. 200 sample people were randomly chosen from exceptional children's rehabilitation centres.

### 1.2 Aim and Objectives

Since this research is inter-disciplinary, the need for attachment to the place is defined in its architecture. There is much research on autism and its effective

factors on it in psychology and it is true about the second matter in architecture. But no research focuses on these two aspects, so we can't mention any research advantage or other personal studies. It's the essential point of this research and analyzing these two factors along with each other.

## 2. LITERATURE REVIEW

### 2.1 Autism

Autism is in the group of neurodevelopmental disorders that are identified with repetitive behaviours, social interaction and communication disorders. This disorder is seen in social interactions and communications with some stereotyped behaviours. Attention-deficit disorder in autistic children is so extreme that some parents mention it as one of the most important signs of autism. Because of attention deficit problems, autistic children show amnesia or ignore to reaction toward the stimulants or react toward an extreme (Moradi, et al, 2019).

### 2.2 Autistic children characteristics

Table 1 shows the characteristics of children with autism.

### 2.3 Rehabilitation

In health science, rehabilitation helps the disabled person to regain his or her loss of ability after an accident, a disease or an injury. Rehabilitation is a vast field in health science and helps people to overcome their problems after some damage due to a brain stroke, spinal cord injury, orthopaedic surgery, concussion, burns, low hearing, central auditory processing disorder (CAP), unbalancing problems and others, and recover functional independence. Rehabilitation means repowering and restoring the abilities of a person to the highest point of independence. There is no medical prescription in rehabilitation, contrary to medicine, and the recovery is gradual. Motor Control Theories are the basic points of rehabilitation (Ganji, 2020).

### 2.4 Place Attachment (Topophilia)

Place attachment refers to the emotional effect of an area, not the people, despite the feelings or culture that they are attracted to. The emotional sensory and internal effect on the place on a person is the centre of thought of place attachment since people can be attracted to an object, house, building, area or natural environment. Place attachment is a typical relationship with the place which is made by giving special cultural common emotional and sensory meanings to a special place or land by people and will be the basis of a group or individual's understanding of the place and the way of relating to it (Magda, 2014).

The place is not considered a shelter for human activities, but a phenomenon that a person by interaction gives meaning and is attached to it so much that sometimes recognizes himself in it. Considering this subject through human needs, the demand for emotional interaction with the place that he/she lives in, or in other words, 'place attachment' is one of the most essential factors in the relationship between humans and places that should be considered by architects,

designers and urban planners. Previous studies have demonstrated that place attachment has different emotional, cognitive, functional and behavioural dimensions. This quality is formed based on five key elements: human, place, participation in the place designing process, and the interaction between humans and place and time (Pourjafar, et al, 2016).

To define the concept of place in childhood, Chawla (1992) says: 'Children show their place attachment when they feel happy being there and feel sad and regretful to leave there. In a way, they prefer that place not just for physical satisfaction but also for intrinsic qualities.' According to his studies since the middle childhood era when deep social attachment to the family decreases, the child's experience of the physical environment and therefore place attachment appears. Place attachment is internal traction to supply security and help the child to overcome stress and anxiety. A child is in relation to a place where it is a safe centre and provider of security qualities or learning that place is stressful for him/ her. In fact, the place is where he/ she is connected and an immune centre for him/ her. When he/ she leaves it to find out a new environment and location, in the case of anxiety or fear goes back there (Mostaghni & Etemadi, 2017).

The other important point in place attachment is the effect of nature on it. Direct and indirect nature is one of the most effective factors in physical, emotional, perceptual and even moral human growth. In fact, based on some of the sources, the importance of nature and animals is determinant and may be completely outstanding in the first and middle eras of childhood. Many reasons can justify this major effect, such as similarities and familiarities between some of the animals with us, the thesis of having sense and perception, the ability of movement, similar body functions with us, and similar ancestral and morphology between human and vertebrate animals. Children have an intrinsic desire to predetermined hereditary discovery and connect to the natural world which is called biophilia or love of nature. There is evidence that vitalism exists in children even the ages below two years old. To develop the intrinsic property, and vitalism in children it is essential to give them suitable ongoing opportunities to learn about the world around them, that complies with the children's main rules of growth and learning (Zarabi, 2015).

As mentioned later, the main purpose of this study is to recognize the factor increasing place attachment of autistic children. In order to achieve valid results, the questionnaire made by the researcher is used, consisting of 30 questions with 5 effective semi-factors of place attachment in autistic children. Semi-factors include spatial perception caused by vision utilization of olfactory gustatory, hearing stimulation and touch (tactile) pleasure. The questionnaire is collected from parents of 200 autistic children. The samples are chosen from rehabilitation centres for exceptional children, and the methods of sampling and choosing sample ones randomly and from autistic children's parents in these centres.

### 3. METHODOLOGY

To analyze the validity of instrument structures exploratory factors analysis methods are used. The outcome of the review is explained in the report and approves the structural validity of the instrument KMO [1] indicator in this research is 79, which is an acceptable number and implies that the chosen sample of 200 people suffices for factor analysis. In analyzing the matrix adequacy, the Bartlett indicator is 2946.51 which is meaningful at the level of  $p \leq 0.01$ . So the gained matrix is good enough and the data of this research can be factors that allow us to continue the factor analysis.

Studying the correlation matrix represented that the KMO for each element of the questionnaire was higher than 0.7 which proves the sufficiency of this factor for all the questions on the questionnaire. Furthermore, the study of reproducing and remaining correlations, shows that the number related to the remaining correlation of all the questions is very small and it means the factor analysis ends with good outcome of data. So the possibility that the recognized factors show the real situation of things in the real world, becomes stronger. The following data is considered by factor analysis using varimax rotation. According to this rotation, 5 factors had a special amount higher than 2, the related numbers to the special value, variance percentage and compression variance are presented in Table 2.

According to the numbers on the tables, the specific value (the sum of the squares of the factor load) of the 5 first factors is higher than 2. This means that after applying varimax rotation, 5 acceptable hidden factors have been found out in the questionnaire. These 5 factors could explain 52.58 percent of the variance (see Figure 1).

In the next step varimax rotation is applied to achieve a simpler factor structure, as shown in Table 3.

After recognizing the factors by exploratory factor analysis the questions about each of the recognized factors were analyzed and the factors were named. So, the first factor is spatial perception caused by vision, the second one is utilization olfactory. The third one is utilization gustatory, the fourth one is stimulation and touch pleaser and the fifth factor is utilization hearing. Although questions 1-4-11-18-22 had a factor load higher than 3 in more than one factor and were put aside from the questionnaire.

### 4. RESULTS AND DISCUSSION

Regarding the outcomes of the research, it can be said that the most important factor in attachment to the place in autistic children, is the spatial perception caused by vision. This factor covers 14.30 per cent of the whole score of place attachment. Utilization of olfactory stands on the next grade covering 13.67 per cent of the whole variance score of place attachment. Utilization of gustatory with 9.29 per cent variance, stimulation and touch pleaser with 8.43 per cent, and auditory stimulation with 6.86 variances are in the next ranks. For this reason, it is advised that in designing the open space

of rehabilitation centres for autistic children, the spatial perception factor resulting from visual activity be used more. This means that the materials used are varied and with different textures to help the child recognize their position by seeing them. Also, in designing the green space of the area, different flowers and plants should be used, which include edible vegetables and fruit trees.

Furthermore, in the plan of micro-spaces of external spaces, items such as various spaces of different types of shadow space, low-shadow, and divisions of fields with different uses (such as designing playgrounds, pools, and water) should be considered.

[1] Kaiser-Meyer-Olkin Measure of sampling adequacy

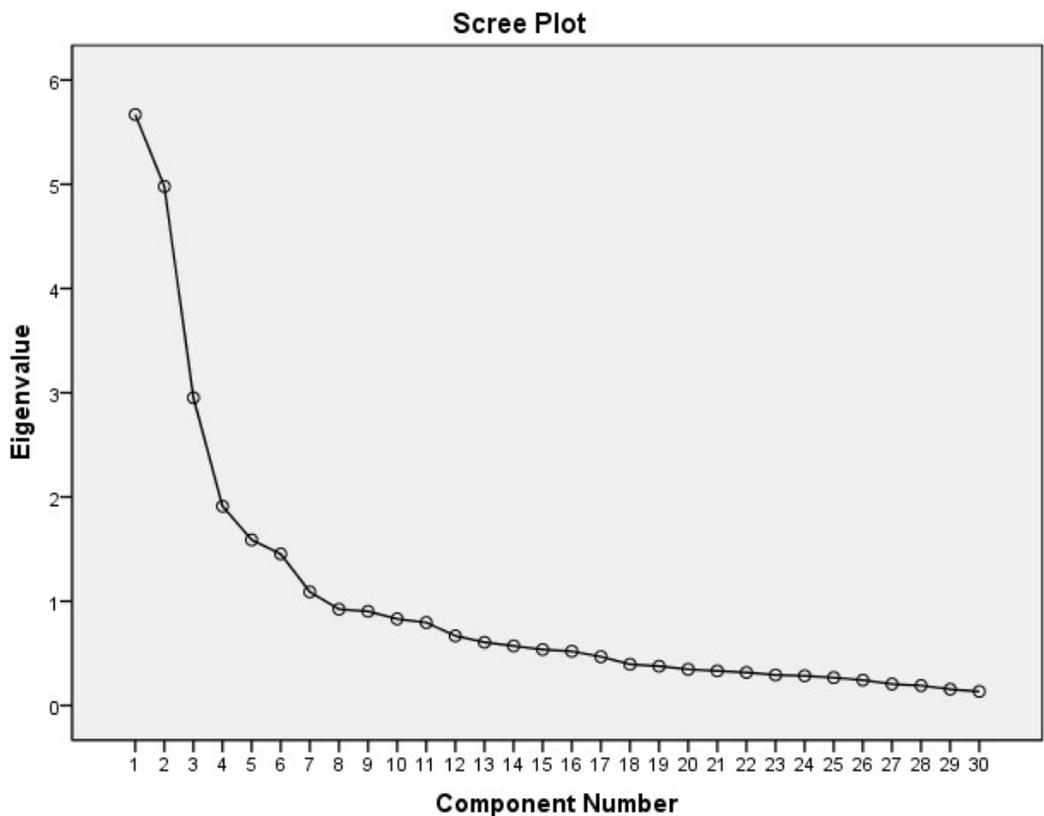


Figure 1: Number of factors and specific values in factor analysis of the questionnaire (Source: Author's analysis using SPSS)

Table 1: Characteristics of children with autism

(Source : Ganji, Mehdi. Psychology of Exceptional Children based on DSM-5)

<b>Autism Spectrum</b>	<i>Social disadvantages</i>	Extreme selection
		Mind reading
		Increasing sensitivity
		Lack of social interaction (verbal, nonverbal, reciprocal)
		Sensory or emotional deafness
		The genius remained in himself/herself
		A lone wolf
	<i>Language disadvantages</i>	Using language regardless of the texture
		Improper tone and voice
		He/she speaks for you, not with you
		Echo and parrot-like speech
	<i>Stereotyped behavior</i>	Reverse use of pronouns
		Limited repeated games
		Strange interested
		Repetitive movements
	Getting used to a routine	

**Table 2: Factors, percentage of specific variance, and specific values (after rotation)**

(Source: Author's analysis using SPSS)

Factors	Specified value	Variance percentage	Compression variance percentage
1	4.29	14.30	14.30
2	4.10	13.67	27.98
3	2.78	9.29	37.27
4	2.53	8.43	45.71
5	2.06	6.86	52.58

**Table 3: Factor loads of questions and factors discovered (after rotation)**

(Source: Survey by Author)

Factors	Questions		Factor load
Factor 1: Spatial perception caused by vision	3	Different spaces the place make your child likes to visit them frequently.	0.69
	10	To what extent do crowded and dimly-lit spaces inside the place help your child to recognize their position inside the place?	0.56
	13	The variety of materials used on the floor is an important factor because of which my child likes to visit the place	0.63
	15	To what extent does seeing water in the place help your child to recognize their position inside the area?	0.63
	21	Your child knows where the outdoor space is when he/ she sees the shape of the playgrounds and outdoor uses.	0.54
	24	Your child can recognize where he/ she is settled outdoor by considering the shape of the flowers and plants existing there.	0.67
	25	Your child knows where the edible vegetables are in the area.	0.43
	28	Your child knows where the fruit trees are in the area.	0.70
Factor 2: Utilization of olfactory	2	The smell of the flowers helps my child to recognize his/ her situation in the place.	0.83
	5	The scent of plants in the place is an important factor that the place is visited again.	0.83
	8	To what extent does your child know how different flowers in different parts of the place smell?	0.53
	16	The variety of the plants in the place is a factor that makes my child desire to be in that area again.	0.49
	20	How much does your child enjoy the smell of damp soil in the open space?	0.48
Factor 3: Utilization of gustatory	23	How much does your child enjoy smelling the existing flowers outdoor?	0.55
	7	how much does your child enjoy the smell and taste of the plants outdoor?	0.66
	14	How much does your child enjoy eating the fruits from fruit trees in the outdoor place?	0.53
	17	To what extent does eating vegetables outdoors make your child feel happy?	0.77
Factor 4: Stimulation and touch pleasure	19	Eating vegetables outdoor is a factor that makes my child willing to be in the area again.	0.81
	9	Your child likes to go outdoor repeatedly to touch different kinds of plants.	0.56
	27	How much does your child enjoy touching butterflies and domestic animals outdoor?	0.65
Factor 5: Utilization hearing	29	One of the most important reasons to return to the place repeatedly is to touch the animals there.	0.68
	30	How much does your child enjoy touching flowers and plants outdoor?	0.51
	6	How much does your child enjoy hearing water sounds outdoor?	0.64
	12	To what extent is it enjoyable for your child to hear the sound of birds and domestic animals outdoor?	0.73
	26	One of the important reasons for my child to visit the centre frequently is to hear the sound of the water outdoor.	0.55

**REFERENCES**

1. Chawla, Louise. (1992). Childhood Place Attachments, in Human, Behavior and Environment book series (HUBE, vol. 12). Plenum Press, New York. P. 63-86.
2. Ganji, M. (2020). Exceptional Child Psychology based on DSM-5. Savalan, Tehran.T
3. Magda, M. (2014). Architecture for Autism: Autism Aspects in School Design. International Journal of Architectural Research Vol. 8, Issue 1. P. 158.
4. Moradi, Hadi; Movahedi, Ahmadrza; Arabi, Mohadeseh. (2019). The Effect of Perceptual Motor Exercises on Improving the Executive Functions of Children With Autism. The Neuroscience Journal of Shefaye Khatam, Vol. 2. P. 416.
5. Mostaghni, Alireza; Etemadi, Shahrzad. (2017). Sense of a Place Formation in Children. Armanshahr Architecture & Urban Development. P. 113.

6. Pourjafar, Mohammad Reza; Izadi, Mohammad Saied; Khabiri, Samaneh. (2016). Place Attachment, Conceptualization, Principles and Criteria. Quarterly Hoviatshahr. Vol. 9. P. 64.
7. Zarabi, A. (2015). Pattern of Nature-based Play Therapy (Fluorine) in the Interventions of Children with Autism Spectrum Disorders. Humanities, Psychology and Social Science. Tehran.



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(a) *Chapter News:* This includes various interesting activities from the Centres of your Chapters (maxm. 500 words for the news from the *entire* Chapter). All material sent should be sent in the following two components :

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# STORIES CAPTURED IN TIME

## CONFIGURING THE LANDSCAPES OF KACHCHH

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**Figure 1: Layers of Landscapes**  
(Source: <https://www.thisiscolossal.com/>  
Artwork delivered by, Author)



## ABSTRACT

The myriad features fashioned out of bare rocks during India's long odyssey have fueled the imagination of humans for centuries, which has assembled a historical record of a planet and trace events that occurred long before humans roamed our planet. India, therefore, is abundant in geological diversity, yet the sense of heritage that these magnificent creations instill is bereft of a spotlight. Geo sites have immense potential in educating the masses about earth processes, signatures of past climatic changes and catastrophic events that occurred in the past. It can help understand sustainable environmental management within a developmental framework. Integrated with India's cultural ecosystems, geo sites would help reconnect with the dynamic past.

Therefore, this dissertation focuses on the Kachchh district of Gujarat, known as a natural geological museum by earth scientists, which is one of the best well-exposed on land records of Cenozoic life and climatic records in India.

## INTRODUCTION

Gujarat is a land that inspires endless fascination. Kachchh is one such destination which despite its harsh environment, its people have developed an astoundingly vibrant identity. It is known for one of the most ecologically and culturally abundant landforms, surrounded by the Arabian Sea and the salt-coated desert wilderness of the Rann of Kachchh. The brimming profusion of nature's beauty, culture, and tradition, a plethora of colours and celebration, joy and beauty, all together reflect the magnificence of the kaleidoscopic Kachchh.

Apart from the Rann Utsav and the peculiar culture of Kachchh, the landscape of Kachchh is one of the best-exposed land records of Cenozoic life and climate record in India. The rocks of this region have experienced historic evolution, hence providing a broader spectrum of geodiversity from nearly 4000 million years. It exposes unique geological features viz., sedimentary rocks with a variety of primary sedimentary structures, volcanism, and plutonium-related structures, sedimentary weathering and clay minerals, unique geomorphic features, secondary structures like faults, folds, domes, anticlines, and the impressive occurrence of varieties of fossils.

The thesis is aimed to describe the geological significance of the region while identifying the role, intent, response and purpose of architecture.

The region with geo-heritage value is a dynamic entity, which needs some built form to protect, conserve, study, display and celebrate its geo resources through sustainable development of the region.

Architecture in such a case needs to intervene in an exact balance between enhancing the richness of geo-diversity through promoting geo-conservation, geo-tourism and raising visibility and awareness among people, while on the same hand not sacrificing or causing any harm to geo-sensitive regions.

## METHODOLOGY

The research enquiry was done at two scales:

### A) Global Context

The dissertation looked into the broad spectrum of understanding the concept of geo-heritage globally and



Figure 2: Landscapes of Kachchh (Source: Rahul Zota)

understanding its significance, principles and functionality. Various case studies were used as a medium to understand terminologies and identify the type of visitors. Different ongoing practices and organizations across the globe were identified and studied for better understanding.

### *Results and Findings from case studies:*

*Case study 01:* Villuercas Ibores-Jara, UNESCO-identified Global Geo Park, is a success story in the development of its educational project. At the same time, it seeks to identify all the educational activities and teaching resources that the Geo Park provides as part of its project. The study conducted also aims to address the perception of geo visitors and the aspects or facilities they expect.

*Case study 02:* The study of Hong Kong National Geo Park explores strategies to achieve the sustainable development and management of Geo parks through addressing the knowledge gaps in the perception of Geo Park visitors, and the findings, particularly the visitor's preference and their willingness to financially support conservation and management.

### B) Indian Context

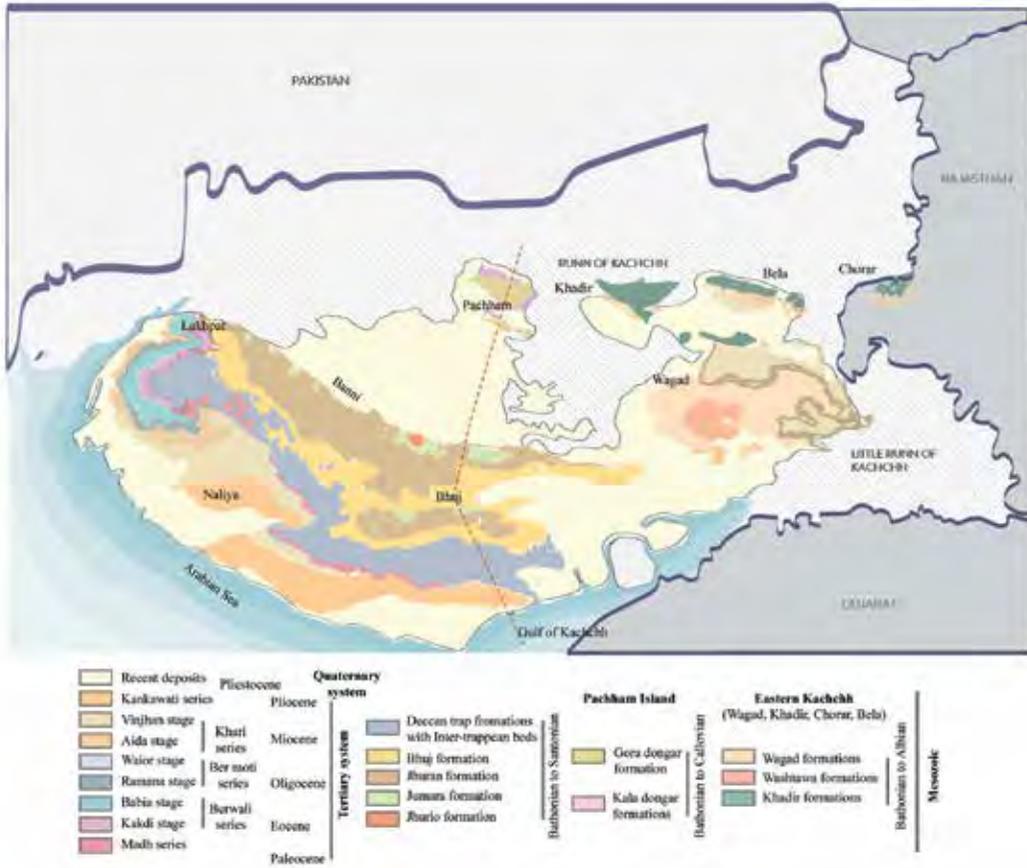
The historic evolution of the entire landmass was traced and briefly studied, right from one super-continent, Gondwana to the separation of the landmass. The impact of powerful tectonic forces on landscapes resulting in diverse patterns was studied.

### C) Regional Context

The dramatic geological features fashioned out of bare rocks of Kachchh were identified. On the same hand, analyzing current needs and future requirements of the region and developing strategies to promote, display and celebrate the geo features with its visitors. Regional maps were studied to understand the connectivity, topography, physiography, seismography, geology and stratigraphy.

## DISCUSSION

Besides the rich cultural traditions, the entire Kachchh is a 'geo-heritage site', not just for the aesthetic value of the landscape. The geological evolution and natural history of the Kachchh make for an incredible story, etched and recorded as it is in every rock. The fault blocks of the Kachchh Basin in western India offer to the visitor a unique



**Figure 3: Map showing Major Physiographic divisions of Kachchh (after Biswas, 1982)**  
 (Source: Adapted by Author from: <https://www.researchgate.net/figure/Major-physiographic-divisions-of-Kachchh-Mainland-after-Biswas/>)



**Figure 4: Graphic showcasing the Geo sites of the Region (Source: Author)**

opportunity to observe the Jurassic-Cretaceous Paleogene sediments rarely outcropping anywhere else on the Western Indian continental margin. The Kachchh basin in western India exposes unique geological features for fundamental and applied study for geoscientist. The Kachchh is well known for its standard geological sections that serve as a stereotype for regional and global correlation in geological studies. Kachchh basin as a whole preserves the record of sedimentation for the past two million years. The Cenozoic sedimentation is considered a type section for the shallow marine sedimentary record in India. This sedimentary succession acts as a geological museum for palaeontology, stratigraphy, biostratigraphy and sequence stratigraphy.

Perhaps the most striking feature of the country is its sterility, naked rocky hills and sandy plains presenting in this respect a strong contrast to the more fertile portions of India; and yet parts of it are far from being picturesque, though its barrenness is heightened by the scarcity of trees and the general absence of anything that can be called a 'jungle' (Wynne, 1872).

Globally, Kachchh is known as a natural geological museum by earth scientists. Some of the macro and microfossil species of Kachchh are extensive from the world over in the Cenozoic seas and are ideally developed in Kachchh, to be useful for the formation of specific biostratigraphy. The people of Kachchh have a rich cultural heritage which is very well acclaimed. In view of all these, the need of the hour is the preservation of the unique geo-heritage of Kachchh.

Within the realm of education, these sites could be used as research sites for important geo-scientific issues, educational field areas for earth science students, and scientific popularization venues for the general public. The common people have inadequate knowledge of geology. Hence, it is very important to make the local people aware of the importance of geo areas.

Sites with educational and scientific value were identified through and region and studied briefly.

### ARCHITECTURAL PROGRAM DEVELOPMENT

Based on a study of geological institutions in Kachchh, such as the Indian Institution for Geomorphologists, Journal of Environmental Protection, The European Association for Conservation of the Geological Heritage and a study of initiatives and research by institutes to preserve the geo-sensitive sites, reports, interviews of geologists, university HODs and a resident, statistical analysis by the University of Kachchh and a few case studies led towards summarizing the visionaries of the user group and understanding the requirements of the region. Hence deriving the program for the architectural intervention. The program consists of three main divisions : the visitors' centre, the Earth gallery (museum) and the knowledge centre.

### ANALYSING THE STUDY REGION

The sites with geo-heritage values were further shortlisted on the basis of various set parameters: unique geological characteristics, accessibility, context, visual appearance, stratigraphic and lithographic formations.



Figure 5: Map showcasing selected Geo sites w.r.t the study (Source: Author)

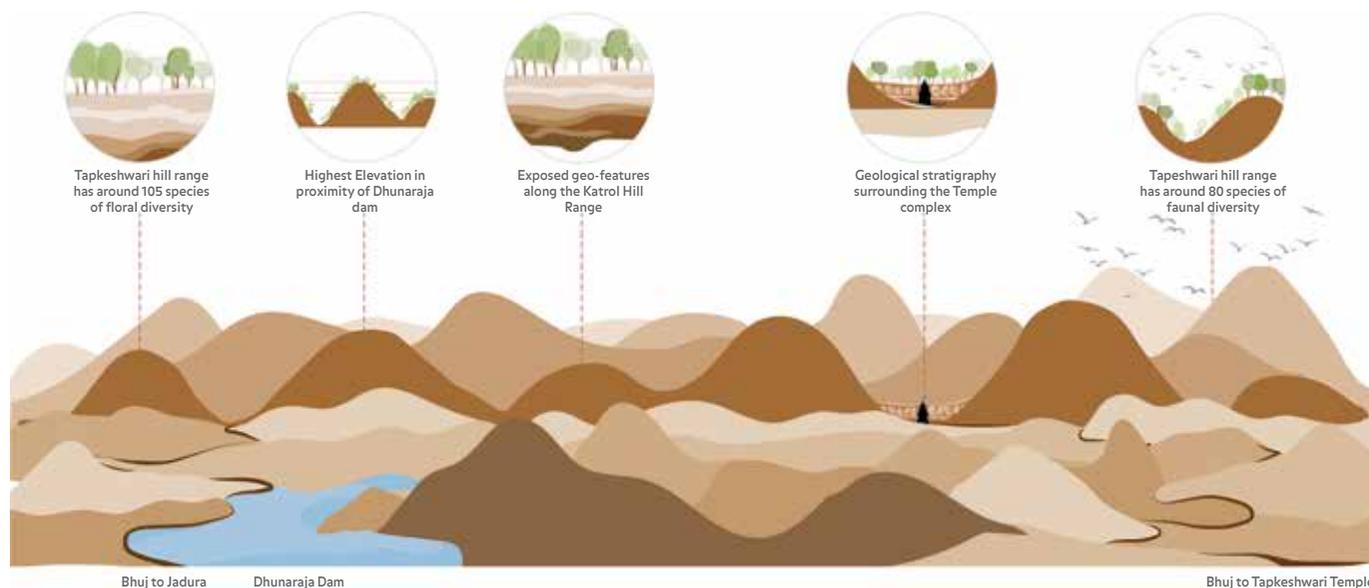


Figure 6: Illustration showing varied characteristics of Tapkeshwari Hills (Source: Author)



Figure 7: Architectural space explorations (Source: Author)

Four sites were selected which lay close to the city centre, Bhuj. The selected regions pertaining to geological diversity were further analyzed to acquire one ideal region which could be further developed with architectural interventions to promote visitors' experience.

Further, the four sites were studied intensively, among which one was found ideal as a site for the design intervention which catered for the needs of extrinsic as well as the intrinsic groups of users. The selected site lies in Tapkeshwari, Katrol hills, 9 km away from the city centre. Tapkeshwari is a popular place of pilgrimage for Hindus. It has a unique geographical setting surrounded by water and wasteland. (Patel, et. al, 2004) and shows a diversity of flora and fauna. Adjacent to the site lies Dhunaraja Dam, another natural feature of the same region, the Katrol hill range. The dam is significant as it contributes to the larger system of water bodies of Bhuj. It holds water from the ridge and directs it to the Hamirsar lake which is where Bhuj city started developing. Dhunaraja dam is the only traditional water catchment efficiently working and which is not affected by urban development.

**PHYSICAL MANIFESTATION**

As a site for intervention was located in a hilly region, site-specific analysis was done w.r.t topography, tracing the seismic activity from the past to understand the faults passing

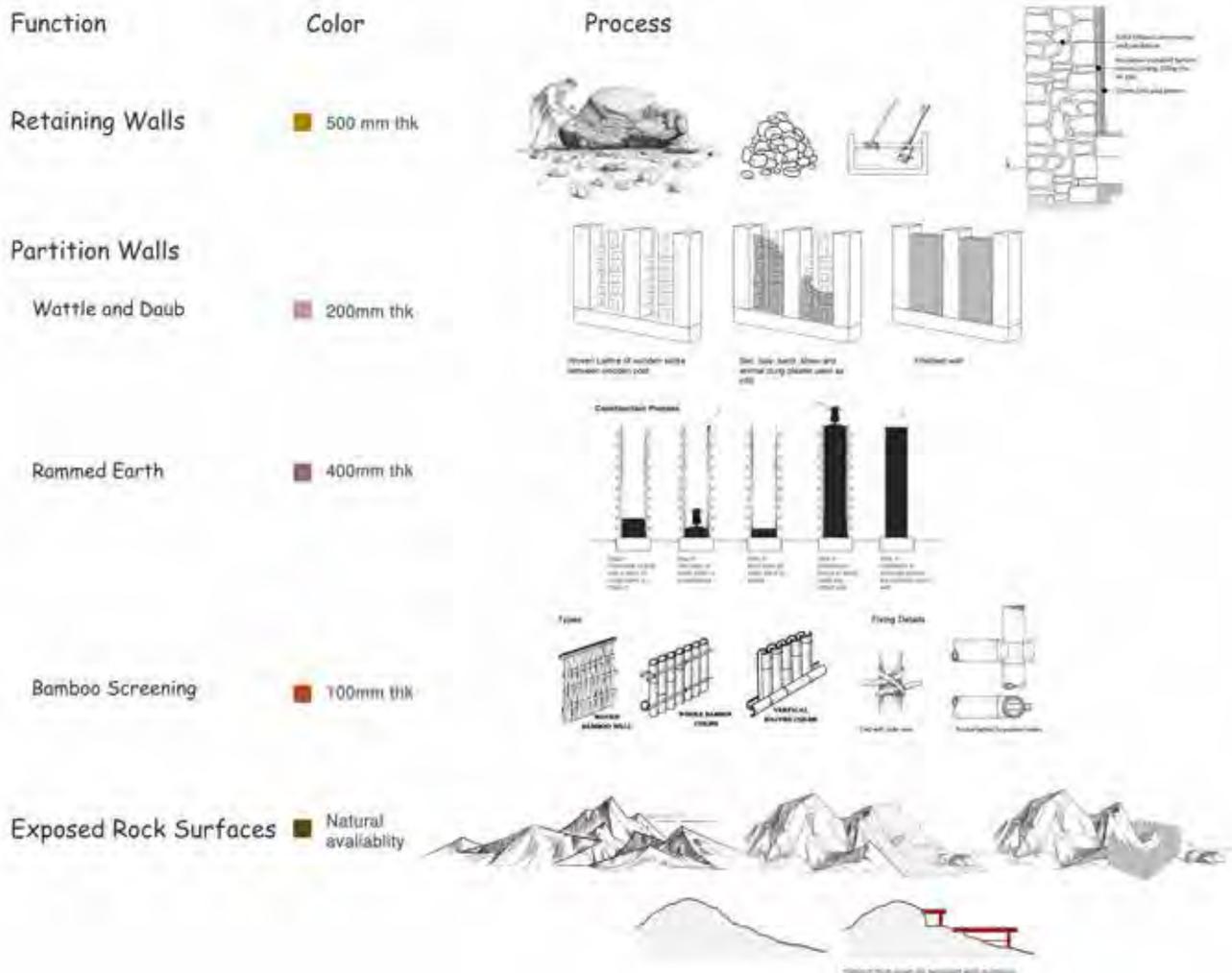


Figure 8: Construction Strategy developed for Design Intervention (Source: Author)



Figure 9: Spatial composition of intervention on site (Source: Author)

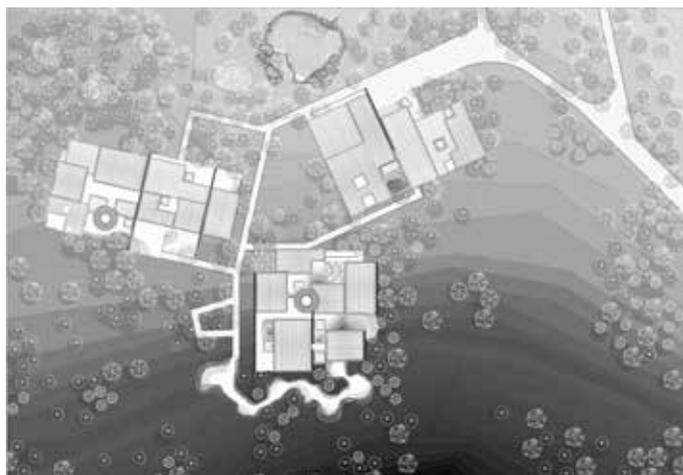


Figure 10: Site Planning of Design Intervention (Source: Author)

through the region, climate analysis, elevation analysis, slope analysis and hydrology analysis. Different sections were cut through the site to understand the scale and historic impact on the particular region. The layers found below the immediate ground were used to advantage in creating spaces around and narrating an experience for visitors.

### ARCHITECTURAL EXPLORATIONS

Various models and graphics were made w.r.t materiality, context, region and emotions. Textures of the region from different geo-sites and local architecture were studied.

Traditional architecture like bhunga houses and region-specific architecture like Khamir and Hunnarshala were documented to understand construction techniques, materials and their response to climate and seismic forces. The comprehensive study of spaces, emotions, textures, materials, colours and regionally relevant architecture helped to derive a palette for architectural intervention.

### ZONING

The visitors centre, earth galleries and knowledge centre are oriented in a manner forming a central open space, acting as a focal point of intervention, housing various informal gatherings. The journey of an experience starts with the visitor's centre, passes through earth galleries and ends at the central pavilion, which is also connected to the knowledge centre, while also having a separate entrance.

As the intervention lies in a hot and dry climate, each part of the intervention is designed with small water retention ponds between structures to collect the surface runoff and water flowing from the roof during monsoons and guide the



Figure 11: Section through Museum (Source: Author)



Figure 12: Section through Museum (Source: Author)

water towards the bigger water retention pond. The water eventually is processed and reused by the visitors through the structure.

### SPATIAL ORGANIZATION

The relationship between man and geology (nature) and between architecture and the landscape is continually renewed. Architecture built within the natural landscape represents a certain kind of poetic exploration. The spaces are designed in a dramatic manner taking through various built spaces while the natural landscapes flow inside the built spaces, creating pause points in-between for visitors to feel the presence of nature around. The human presence in spaces amidst natural landscapes creates an interplay of scales.

The development of concept and zoning was a hand-in-hand process, to create a connection between the landscape, man, geology and architecture. The main road leads to the pathway connecting the structures, creating a sense of excitement and eagerness to experience the landscapes of Kachchh. The pathway connects the visitors centre for visitors and the knowledge centre for researchers while the visitor centre connects the museum.

The experience starts with the visitor centre housing ticketing and security, waiting area, information desk, management, restrooms and cafeteria. It further leads to Earth galleries—the museum housing different exhibits describing the geology of Kachchh through various mediums, rock exhibits, fossil exhibits and un-Earth. The rock and fossil exhibits are showcased in a manner in which they are found originally, raw and unfinished. The spaces of these exhibits are designed by allowing the natural unfinished terrain to flow inside the



Figure 13: Sequence of views throughout the intervention (Source: Author)

built intervention to create a natural and raw experience. The un-Earth is the space sculpted on natural land, where people can see and experience the layers of earth naturally formed through time, while at the end of an experience carving out the cave through the land to exit the Earth galleries. The museum creates a sequence of experiences while also spreading knowledge and creating an awareness of the marvellous landscapes which are a precious heritage that architecture can and should enhance while protecting it, to be passed on to future generations.

Lastly, the knowledge centre connects the main path and museum, including research laboratories, workshop spaces, exhibition area, library, administration office, seminar room and achieves room. The research labs are designed in a manner to get an ample amount of natural light for researchers to conduct their practice. The exhibition area is designed with a central opening to flush the light on the exhibits. The library space and seminar spaces are connected with an outdoor informal seating area where various workshops could be conducted, while archives store the exhibits from the museum.

## CONCLUSION

The designed intervention is considered a man-made landscape within the natural landscape which blurs the boundaries between inside and outside. It exhibits the natural layers of earth, creating synergy between architecture and nature. The spatial composition embraces and praises the natural museum which is formed over the years. Walking through the entire trail of intervention offers a sequence of different views along the way. Such dialogues between man and geology (nature) could happen at all geo-sites with minimal interventions, which will help man to reconnect the past to the present and future.

## REFERENCES

1. Patel, Rohitkumar; Gajera, Nikunj; Prajapati, Harish. (2004). *Bio Diversity of Tapeshkeshwari Hill: Status of Flora and Fauna*. Scholars' Press, Germany. DOI: 10.13140/RG.2.1.1867.6324.
2. Wynne, A.B. (1872) *Memoir on the Geology of Kutch to Accompany the Map*. Compiled by A.B. Wynne and F. Fidden during the Season of 1867-1868 and 1868-1869. *Memoirs of the Geological Survey of India*, 9, 1-293.



Figure 14: Culmination of experiences . . . taking the energy, memory and experience home. (Source: Author)



**Preeti Jaisinghani** graduated from IES College of Architecture, Mumbai in 2021. The article is the summary of her final year thesis journey which began with her own experience while she traveled for an earth construction workshop in Bhuj, Kachchh, Gujarat. Her keen interest in traveling and exploring newer things led to deciphering the landscape narratives of Kachchh and gave her a whole new perspective on this secretive world. [jaisinghanip98@gmail.com](mailto:jaisinghanip98@gmail.com)



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# PANEL DISCUSSION ON ARCHITECTURE AND THE CITY: A BANGALORE PERSPECTIVE

Ar Bijoy Ramachandran

In late July of 2005, I was invited to participate in an expo in Bangalore. The idea was to give young architects like me a chance to get noticed. I took the stall, but instead of designing and building the perfect bedroom, I set it up with a TV, two speakers and an amp and screened a film. It was odd, to put it mildly. Many people stopped and wondered what this was about. Many wanted my television, some even offered a good price on my jute rug, and then there were some who would sit on the floor and watch.

The film was 82 minutes of architects talking about design, the profession, public processes, professional frustrations, and personal manifestos. Suddenly architecture was out in the public domain, lay people started commenting on design; they found to their utter disbelief that architects didn't drive Ferraris, and holiday in Bora Bora; that planning efforts required designers; that architects did more than just elevations; that truth be told vastu was the enemy; and that though architects loved to talk (as was evident to anyone

watching), almost all of us found communicating with our clients the toughest part of our job.

I kept a diary on site and it is filled with random comments by the visitors on issues rarely discussed in the public domain, issues to do with our built environment, its impact, the political and social meanings attached to it, and the place of design in our lives. It is time now for these discussions to find their way into mainstream media - newspapers, television, etc. Without this extensive and critical coverage the debate about what makes for good architecture, and in turn a good city will never find resonance amongst the most important people in the world, our potential clients.

For the film I met with 24 architects, 3 academicians and 5 students of architecture in the city over the course of two weeks. I collected around 15 hours of footage, traveled close to 500 kms, and lost 5 kilos in the process.

## 06. THE COA & THE IIA: Do we have a common platform?

**Soumitro Ghosh:** They have become rather dead, defunct. They are not seen as places, which talk about ideas or as places which are to do things. They have lost their purpose.

**Prem Chandravarkar:** Our forums on architecture tend to be more legalistic. If you look at what the Institute of Architects or the Council of Architecture is doing - they just look at protecting the title of the architects on laws regarding who can sign on drawings etc. There hasn't been enough of issue based discussion on architecture even within the profession.

**Ravindra Kumar:** I think even in some ways bureaucracy has seeped into the organizations in some subtle ways.

**K. Jaisim:** I am going to get bashed for the answer I am going to give you (laughs). I think they have become very political. They have become very bureaucratic. Everybody is out there for the chair not because they deserve the chair but because they think by sitting on that chair they get something. There is no direction, there are no ideas, I think it's just there as one more... it's not even a tamasha, they think that by sitting on that chair they'll get some sort of importance. Since they are regulatory bodies, since they have got the authority to penalise you, they survive. If you take away that penal authority, saying they can't cancel your license, tomorrow morning both will be buried.

**Rajmohan Shetty:** They haven't done much. I mean they go through this charade of reviewing schools right? How is it, I would ask after they have reviewed these schools, that you still have schools with no furniture, no library, no space, no toilets and they still get accreditation.

**Janardhan Reddy:** I have got little communication or nothing at all from these two institutions. So I am not really aware of their efforts and what they are doing. I feel there is a lack of communication between us, architects practising in the city and the institute.

**Arunjot Singh Bhalla:** Architects do not have a common platform to sit and discuss across the table. Maybe everyone is too busy. There's a lack of will.

**Hareesh Asnani:** But it should be a professional collective direction.

**Akhtar Nagaria:** IIA should be playing a good part in it, COA should be playing a good part of it. We have no forum, we have an institution.

**Anup Naik:** They are the voice. It can actually be legitimate. They can legitimize what we want to say or do.

**Edgar Demello:** Whether it's the COA or anybody else, I think there has to be a body that first of all encourages across-the-board debate.

**P.K. Venkataramanan:** We are working at cross-purposes. I don't think that we are a cohesive unit. Somebody needs to pull them together and make them realize that we cannot exist as individuals. We need to collectively address this situation, then only we can find a solution. This is absolutely true, we are fragmented, and we are not coming together.

**Soumitro Ghosh:** I think it's also, I guess the congregation of architects is not an easy thing. In any creative field, the congregation of creative people is the last thing that will ever happen.

**Ranjit Naik:** From PAA point of view, I can vouch for the fact that the main stumbling block for us was the lack of

enthusiasm from our members themselves. Involvement in these things was not very spontaneous.

## 07. THE BIGGEST CHALLENGE ARCHITECTS FACE: to Dream, to Convince, to Execute

**Sathya Prakash Varanashi:** Why don't you ask me, which are the biggest hundred challenges, don't ask me just one challenge (Laughs). I would say communication. I use the word communication because I am not doing all buildings for myself, we design for others - we need to understand them. Then there's a builder, a builder has a supervisor, a supervisor has a mason, and a mason has a... (Trails off).

**Janardhan Reddy:** I think it would be not finding architects to work for you. (Laughs).

**Anil Dube:** The staffs that you get to work with. It's a bad scene, I tell you. I don't know what they are teaching in colleges. And I think the students also they just look for that degree and come out, and when they work in an office, that's when they start learning.

**Nagraj Vastarey:** I guess the intent, the intent from the clients.

**Ranjit Naik:** Traffic. (Laughs).

**Satish Naik:** To reach the office.

**Ranjit Naik:** That's why leave early and go back home late.

**Sanjay Mohe:** Your ability to convince the client to do something - something what you believe in. See that's the basic difference between an artist and an architect, because as an artist you can just do something and forget about it, you just do what you want, but when it comes to architecture, you have to convince a client to do something good.

**P.K. Venkataramanan:** Sometimes it is a very frustrating thing that some of them won't listen to any of your solutions, they will brush aside, they say, "Either you do like what I say or you are out", that is when sometimes you think - you are running a large organization, there are certain economics in running a large organization, can I refuse this job on my own principal and say don't want, get lost? Is it about you or about a lot of other people who are dependent on you?

**Anil Dube:** And also when people are very adamant about things in design, it becomes frustrating.

**Ranjit Naik:** From our point of view we would definitely say - over interference from a client.

**Satish Naik:** You issue the drawing, it goes to the site, and after a week you go there, you don't see anything as per the drawings, you see something else, what can you do?

**Sanjay Mohe:** Getting it done right. So in terms of workmanship, that whole perfectionist attitude that really lacking in our society for some reason.

**Kiran Venkatesh:** The balance between what we think the project should be about and what we think the project should do, and meeting the clients' requirements. Because many times even though there shouldn't be there's this opposition between the two.

**Ravindra Kumar:** It's trying to convince. Because of this interface of this communication that we try to go through, that process of convincing the client, that this is what is right for the space, this is what is wrong - that is the biggest threshold.

**Edgar Demello:** It is how you make a client understand that you are on his side.

**V. Narasimhan:** Running the business part of it, because in the other realm you are only limited by the strength of your own ideas. Here it is a physical problem. You've to keep it running, you must have continuity because you are building

big projects which will last for a long time. How to be an architect, and a professional and not let go of your design idealism and yet run a business. You also have to have honesty and integrity in detailing.

**Soumitro Ghosh:** I think the most obvious answer is how to run the office, how to keep everybody surviving so that the office doesn't close down, and how to feed the office. You tend to not look at those questions every day.

**Nisha Mathew-Ghosh:** This is personal, I would like to be a better manager as well. It's all very well being a designer and enjoying it and getting carried away but I certainly think I would like to be a better manager as well.

**Soumitro Ghosh:** It's to see that you are pushing at something, which you would like to, and what you have not been able to do in the past.

**Arunjot Singh Bhalla:** The challenge is quality. The construction quality here is pathetic.

**K. Jaisim:** The inability to implement the ideas that flow into you, in their totality.

**Rajmohan Shetty:** They've employed you, in a sense that they, sort of, own you, that you are there to do drawings. When you have the idea that now it's collaborative, in a sense, that now begins an adventure, it'll lead to a process of discovery and they don't realize and in a way, they have lost out on this valuable opportunity.

**Prem Chandavarkar:** I think the biggest issue is learning how to put forward the value that design provides. I think as a profession we've not done that. We don't do that well, that's why we get pressured on fees, that's why we get pressured to survive and we are pushed to compromise because we don't have a way of articulating those values. There are other challenges also such as the environmental challenge, that's something we need to think about - how to make our buildings more environmentally friendly.

**Kavya Thimmaiah:** The biggest challenge for me, personally, is the Vaastu thing.

**Sanjay Mohe:** Instead of people looking just from that Vaastu point of view, they should look at it from all these other energies, which really you have to look at.

**Anil Dube:** Fees. Definitely fees. People take you for granted. They don't go by what the stipulated fees are and of course, there's a lot of undercutting and a lot of competition so people work for much lesser fees and percentages.

**Tony Kunnel George:** The biggest challenge today is to actually be in a position of knowledge - to be able to drive development.

## 08. ARCHITECTURAL EDUCATION: Theory v/s Practice

**Prem Chandavarkar:** In India architectural education tends to be highly vocational so the architectural profession by and large is not trained to think in theoretical or philosophical terms, and that's the other thing we sorely need - to be to talk about architecture in general terms.

**Sudheendhra Yalavigi:** Our objective need not be to prepare students for the profession. As it is being done. We would like to prepare students to be future leaders. We don't want them to go straight to an office and create working drawings. It may be a traumatic experience for the initial one year but slowly they will learn, but nobody teaches them conceptual thinking.

**V. Narasimhan:** From an architectural pedagogy point of view it is very important now for the government, for instance, the Council Of Architecture, [to make it mandatory] that once you come out of college you have to intern for at least three

years under a senior architect who has at least about ten years experience and write an exam after you finish the three years and only then can you practice on your own.

**Arun Balan:** Architectural education in Bangalore should be scrapped and I have seen kids who come and work in our office, all so confused basically because they just don't know what to do, they just want to finish fifth-year architecture and get into a call centre.

**Kiran Venkatesh:** I think it's in a dismal state. A basic grounding in the idea of good design and the approach to good design is not very rampant across the schools. But what has happened is that practices are good, across the country there are reasonably good practices, so when the students train, when the students get absorbed here, their learning curve is very, very fast, so there's a sort of fail-safe mechanism, there's a check that things don't go really berserk and really wrong.

**Sudheendhra Yalavigi:** We are sensitizing the students during their course, right from the first project we take up, that context is an important variable in their design.

**Ranjit (S):** Mine wasn't a conscious decision at all. I thought it was all about sketching, design and colours and things like that, I really don't know what architecture was all about. After I joined the course, after two years, I got to know how sensitive an architect should be to the city, to the surroundings, to everything. That sort of appeals to me right now. I can contribute something. That's what is interesting to me right now to continue architecture.

**Tony Kunnel George:** The education system of architecture from the forties onwards has remained the same. We don't have the information basis today with us to be actually part of the food chain in terms of any development that happens.

**P.K. Venkataramanan:** At the education level, our present syllabus and method of teaching is absolutely antiquated and it's not at all relevant to today's needs.

**Nagaraj Vastarey:** Whenever I walk into R.V. College I keep thinking, you know, in design studio we stress upon spatiality, this, that, we speak of every possible issue. At the back of their minds none of those would be important to them. When they pass out, I don't know if any of this gets applied in practice.

**Ravindra Kumar:** See the problem is that it's back into bureaucracy and academic sequences which have been established some years, years ago and its not been investigated right and they still want to live on that and use that as a weapon. There's no participation of active architects from the city in these academic realms because the bureaucracy kills it. Frankly, if something has to be changed it's best to shut all of them down.

**Ravindra Kumar:** What is happening is people are there together, students are there together, they form a community, they are all headed in a direction so there is an investigation and that's what makes people architects today. It's not the teachers, it's not the curriculum, it's not the academic support or it's not the lectures that they might be involved with. I think it's just being together.

**Arunjot Singh Bhalla:** [This is] one thing that our profession has ingrained in it under the guise of creativity, that if I am in an interview situation with someone I ask him, "Did you finish your thesis on time?"

**Edgar Demello:** The solution, in inverted commas, is really our schools. It has to do with academia, it has to do with faculty I think it's at that level that you create a new consciousness about the public good.

## 09. DIRECTION OF PROFESSION: Is there a new paradigm?

**P.K. Venkataramanan:** The importance of the profession is definitely losing ground. This is my feeling. Unless you wake up.

**K. Jaisim:** I think the profession if I must answer that, is in a big confusion.

**Edgar Demello:** There is a very deep crisis in the profession, that's very clear. You can see it when you open the Times Property thing or you open any sort of paper and you look at Faux Rococo or all these Neoclassical things that are really gaining favour as against the aesthetic or design integrity.

**Arunjot Singh Bhalla:** Where is the profession going, what are we building? Is it worth our while to build what we are building? The architect is no longer God.

**P.K. Venkataramanan:** [The] Architect was put on an ivory tower and the rest of them were all supposed to be services. It's no longer the thing. There is an equal footing.

**Ranjit Naik:** The architect was always the main captain of the ship. Now I don't think I'd be wrong in saying that the PMC, the project management consultant, has taken over that role.

**Tony Kunnel George:** If we sit at today's meetings you have project managers, you have finance consultants, people doing risk management, they take the center stage. Since architects don't understand this, they are not able to add value.

**Anil Dube:** I think, first of all, I would like to say that there's a boom in the industry and it's going haywire. I think in all respects. Look at the design, look at execution, look at the way development is, its all a mad rush, which is why I feel it's very haphazard here in Bangalore

**Hareesh Asnani:** What is going downwards now is the attention to resolving a detail. We are not putting in that much of effort to resolve our buildings.

**Ranjit Naik:** The time taken for the entire process of design, drawing, tendering, and execution - the whole process has been quite compressed.

**Sanjay Mohe:** The speed of the whole conception of the project to the actual execution - there is a tremendous change in the whole scenario. This whole classical way of working where you take a project, keep working on it, keep changing and again coming back and keep improving - all that is slowly things of the past. Nobody has the time to wait, nobody has time to look at all these kinds of options. You have to get it right the first time.

**V. Narasimhan:** What has happened in the last two or two half years is that the scale of buildings has dramatically changed. People talk about the boom in IT, and boom in Biotech, but really speaking the real boom in India is in construction. What has happened is that the architects are still scrambling to get to grips with how to deal with this kind of scale, and in some sense, the clients are also grappling because they've also not dealt with it. We never used to build such big buildings, such giant enterprises and facilities. And that is creating pressure on the architectural profession by what I would call an increasing push towards corporatisation. Companies want to deal with other companies, they don't want to deal with prima donna individuals.

**Ravindra Kumar:** When you see large-scale developments, it cannot be driven by individuals, it has to be a team exercise. Not many firms understand that method. So it's still the individual who dictates and somehow you manage get the process right.

**V. Narasimhan:** This will also drive smaller firms out of existence.

**Rajmohan Shetty:** No I don't think. Good work will always be recognized, at whatever scale and at all levels, it will always be a marker, always be an index, however small the scale might be, of what architecture is all about.

**Anil Dube:** I don't think the small practice is going to die. It never will. There's ample work at all levels.

**Edgar Demello:** I really do see an emergence of practices that are enquiring, that are in their small ways research-based.

**Sathya Prakash Varanashi:** When I started my firm way back about twelve years ago, not many people with thirty-forty sites, salaried, teachers would come to us. But today they are coming to us. It is not linked only to the fact that there is greater money in the market, it is equally linked to the fact that architecture as a profession has become more accessible.

**Nagaraj Vastarey:** One major change which I see today is the emphasis on materialism. It's generally the glory of the material which has overtaken and spatial architecture has taken a back seat.

**H.C. Thimmaiah:** The invasion of mirror architecture - that's what is happening in Bangalore, and sometimes I really wonder whether we need this mirror architecture at all and if we do should we go to this extent. Then, the role of architects also is, I guess, limited. A seller of these items can have various combinations on his computer and present them to the clients, saying this is what you can do, well, then what's the role of an architect here?

**Rajmohan Shetty:** So it's also the process, and, I think, most firms just keep talking about a product, and about management and these tangible, quantifiable aspects, and there's nothing, not a squeak on the qualitative, the spatial, the aesthetic.

**Arunjot Singh Bhalla:** People are getting experiential. They are beginning to realize that buildings are not just nice, pretty objects; they are places of experience. There are spaces that need to be created inside, you just don't keep replicating boxes.

**Soumitro Ghosh:** Place does play a fairly important role because there is a growing danger of getting very picturesque where the experience of a building becomes very flat. Now that works if you are just trying to sell space and get out of that as a seller, but as an architect, if you are trying to exploit issues of experience of a space, then I think the game is a little bigger than what it is otherwise.

**Nisha Mathew-Ghosh:** I think that somehow because of the media one has access to there is a large amount of self-consciousness on the part of the architect, which leads to a lot of contrived work. But now, today especially, there's so much nice-looking work which is not deep at all.

**Rajmohan Shetty:** What they have done is that they have cultivated an audience of clients who think that is the way architecture should be done - these pretty things that are pretty much picked up from all sorts of sources and collaged together.

**Prem Chandavarkar:** So that eventually creates a direction where architects are just designing for other architects. So I think what we need to do as a profession is to sit back and think - about what value design provides and remember that design is actually a propositional activity and that each project has certain propositions about the way we live.

**K. Jaisim:** Contemporary architecture is something that has to be timeless, that has to have a continuity, will change, so that your buildings look new even five, ten, twenty years from now. The material may deteriorate, but the spaces can't deteriorate.

**K.S. Ananthkrishna:** Specifically what I find is, that today the most important kind of buildings that are getting a lot of attention are the ones built for the IT companies, and that to my mind is basically an architecture of cladding.

**Arunjot Singh Bhalla:** If I look at Bangalore I feel a little more optimistic. Now, what's the reaction? The reaction is too much glass, too much aluminium is happening. But if one tells oneself that you are here not to force, your role is to be a moderator, your role is to, as an architect, enable the client to make the right decisions. You cannot neglect the fact that it's the client's money, not yours. You are the tailor but you didn't buy the cloth here.

**Nagaraj Vastarey:** You lose the sense of direction, sense of time and space, so whether it's night outside or whether it's day outside, you won't just get to know. So what's the big deal? All they require is just a shell.

**K. Jaisim:** It's bright sunlight outside and it's closed, it's air-conditioned, and plus it has a million Watts glowing inside. Why? Where did we get it wrong??

**Prem Chandavarkar:** A large part of the profession has tended to look at superficial, quick solutions, to look at aluminium composite panels, to look at structural glazing, to look at those as quick-fix solutions by which one creates an international image. But if we do that we will just wind up making Bangalore like another Singapore. So I think, we need to get out of our obsession with technology because technology often provides these quick-fix solutions

**Edgar Demello:** Building services have become rather sophisticated, and they have become that because there is a very strong requirement from, well I'll start by saying, multi-national agencies who bring all their specs from Texas and Michigan and wherever else so you can't really fool around with that and so there is a wrapping paper around these building services.

**Akthar Nagaria:** So many times, I am sure you have gone through it too, guys who have already built their house say, "Sir can you design our elevation, this is what we want."

**Edgar Demello:** And I think in the common mind, I think, architecture is really still about front elevation.

**Anil Dube:** Well we've always been known for aping the west, and I think if you see today, Alucobond® and structural glazing has come to play a big role in the aesthetics of buildings, irrespective of the fact that there's so much of sun, or glare, or heat and the load on air-conditioning.

**Kavya Thimmaiah:** Where you make a little box, trap in all the heat and then you increase your A/C load, and you try to maintain that ambient temperature. Its ridiculous. You are creating a problem and then trying to solve it.

**Edgar Demello:** There are people who I know who have taken architects to court because of their inability to address very fundamental notions of climate.

**Nagaraj Vastarey:** Today you have to profess an architecture of inclusions.

**Manoj Laddad:** We have gone beyond that stage where sharing of a knowledge base is going to help you make better decisions.

**Ravindra Kumar:** I think a very collaborative approach amongst architect is becoming highly important and I think, clients have to drive that sometimes.

## 10. MANIFESTOS

**K. Jaisim:** I always say the three fundamentals [that] can lead to phenomenal architecture- one must have liberty, one must have freedom, and one must have choice.

**Arunjot Singh Bhalla:** Not in-your-face architecture. Good light. Simplicity. I still like Correa's Gandhi Ashram more than his subsequent works. Funny as it may sound, lack of dramatism, breaks off from the cliché of that "WOW" effect. Easy on the nerves, and one more, less building more environment.

**Sathya Prakash Varanashi:** Design decisions are not linked with how we construct, it should be linked with how we want to live.

**Ranjit Naik:** Whatever you do has to be relevant - to the context.

**Satish Naik:** And that gives the satisfaction

**Ranjit Naik:** It should be relevant to the client, it should be relevant to the project, it should be relevant to [the] time also.

**Satish Naik:** And it also should be comfortable for the fabricator.

**Prem Chandavarkar:** Architecture is something that is inhabited day after day, so we have to think about how design provides value over time also. So I would like to use the term the aesthetics of absorption. You tend to be obsessed with the aesthetic of expression, the first impact, but we need to think of aesthetics of absorption, about how the space is inhabited, how memories are created when we inhabit the space and therefore how value accrues over time.

**V. Narasimhan:** So every project we do, hopefully, will become now a benchmark, worthy of study by other architects as a type study at least, if not as a "how is it done"; What design intervention have been made to increase the quality, comfort, intangibles, serviceability, long time maintainability, lower energy costs. It can set a benchmark right?

**Anup Naik:** Elements of Sustainability. The electrical cycle is closed, the water cycle is closed, the sewage cycle is closed; so once you are actually harnessing all of this, I think, you can make affordable buildings, high quality affordable buildings. I think that's not a problem.

**Kiran Venkatesh:** We have been working for the last few years with this notion of Section, a notion of an interiorized project in which the body reacts to the volumetric quality of the space inside, so there's very little partitioning of spaces, there's very little of interior volumes which are bifurcated, it's more a sort of internal connection. It's like a huge cave which has these areas which are functionally demarcated either in sections or by some other device of level difference etc.

**Sanjay Mohe:** We really don't believe in a wrapper. We actually believe in the contents. So, we start designing from the inside out rather than from the outside in. So, the moment you start looking at it from the inside out, probably the aesthetics of the overall form is resultant of the inner needs.

**Nagaraj Vastarey:** As an architect, I need to celebrate space first. Space making becomes extremely important whether from within or from outside.

**Soumitro Ghosh:** I just went and saw the Mill Owner's building in Ahmedabad. After years it still blows you. There are some buildings which move you immensely - I don't know whether we are seeing it as architects as good design. There is a certain experience that other buildings don't give you. Something just is beyond comprehension which is happening - brilliant, and they don't look as if they are some kind of traditional architecture, they don't look like they are so much in the future, but there is extreme groundedness in terms of the materials, the feel, the light and everything.

**Nisha Mathew-Ghosh:** ...And there is something more.

**Rajmohan Shetty:** I still believe in Corbusier's observation that the plan is the generator of space because it allows you

to ponder and reflect on what it is to occupy space and move through it.

**Sanjay Mohe:** As an architect, you are looking at it as a totality, you are not looking at a façade or you are not looking at a functional thing. You don't just stop at resolving functional aspects. You try to look at how the light comes in, how the air flows through, how you harvest water, how you make use of earth, and nature, how can the building breathe by itself and eventually it has to satisfy the aspirations of the client, it has to look at technology, it has to respond to climate. So there are several things which you look at from several different points of view at the same time and try to create a happy place.

#### Collaborators:

Anjali Kondur Menon, My daughter | K.S. Ananthakrishna, RV School of Architecture | Hareesh Asnani, Space Matrix | Arun Balan, The Bodhi Tree | Arunjot Singh Bhalla, RSP Architects | Prem Chandavarkar, Chandavarkar & Thacker | Edgar Demello, Edgar Demello Associates | Anil Dube, Anil Dube Architect | Tony Kunnel George, Atelier d'Arts & Architecture | Nisha Mathew-Ghosh, Mathew & Ghosh Architects | Soumitro Ghosh, Mathew & Ghosh Architects | K. Jaisim, Jaisim Fountainhead | Ravindra Kumar, Pragrup | Manoj Ladhak, Architecture Paradigm | Sanjay Mohe, Mindspace | Akthar Nagaria, Pro-Design | Anup Naik, In Antis | V. Narasimhan, Venkataramanan Associates | Janardhan Reddy, Janardhan Reddy & Associates | J. Sandeep, Architecture Paradigm | Rajmohan Shetty, Rajmohan Shetty Architects | Kavya Thimmaiah, Thimmaiah & Prabhakar | H.C. Thimmaiah, Thimmaiah & Prabhakar | Sathya Prakash Varanashi, Sathya Consultants | Nagaraj Vastarey, Pragrup Amoorhsiti | P.K. Venkataramanan, Venkataramanan Associates | Kiran Venkatesh, In Form Architects | Sudheendra Yalavigi, RV School of Architecture | Tharunya Balan | Satish Naik | Ranjit Naik

#### Abbreviations:

**BATF:** Bangalore Agenda Task Force | **BMP:** Bangalore Mahanagara Palike | **CBD:** Central Business District | **CDP:** Comprehensive Development Plan | **COA:** Council of Architecture | **FAR:** Floor Area Ratio | **FSI:** Floor Space Index | **IIA:** Indian Institute of Architects | **PAA:** Practicing Architects Association | **(S):** Student

Transcribed by Meel Panchal & Sucharita Hazra



**Ar Bijoy Ramachandran** founded Hundredhands in 2003 with his partner Sunitha Kondur, and currently serves as the Design Chair for the post-graduate program at BMS College of Architecture in Bengaluru. Ramachandran has a Master's degree in Architecture and Urbanism from the Massachusetts Institute of Technology and a Bachelor's degree from BMS College of Architecture; he has also attended the Glenn Murcutt masterclass in Sydney. In addition to practicing architecture, he has also produced two documentary films: one on the celebrated Indian architect Sri B.V. Doshi and also 'Architecture and the City: A Bangalore Perspective', on the topic of design practice in Bangalore.

# FROM HEALTHCARE INFRASTRUCTURE TO HOLISTIC HEALING

Prof. (Dr.) R Chandrashekhar

The healthcare sector in India is growing at a rapid pace and contributing immensely to the growth of the quality of services. The sector is expected to grow several-fold in the next decade. While this augurs well for the country, there is an imminent need to introduce green concepts and techniques in this sector, which can aid growth in a sustainable manner.

What is 'Medical Architecture' and how is it different from 'architecture'? This is a question that is often asked whenever we hear this term. In Medical Architecture, one must have a comprehensive approach to infrastructure, medical equipment and manpower.

## Design Concepts and their Role - Green, Smart and Patient-centric

A hospital design, besides being patient-centric should

also be staff-centric. If the staff are stressed, it ultimately affects the patients' recovery. Many studies have proved that by virtue of efficient functional planning, the reduced travel distance of the doctor and nurses within the hospital increases their efficiency, as their daily routine with clinical activities involves long walks within the hospital.

Introducing green concepts in healthcare facilities can help address national issues like infections, epidemics, handling of bio-medical waste, water efficiency, energy efficiency, reduction in fossil fuel use for commuting, consumer waste and general conservation of natural resources. Most importantly, these concepts can enhance the patients' health, recovery and well-being.

A **green building** is one which uses less water optimizes energy efficiency, conserves natural resources, generates



CII- Sohrabji Godrej Green Business Centre First Platinum rated bldg.



India to achieve 'Net Zero' emissions by 2070

less waste and provides healthier spaces for occupants, as compared to conventional buildings. A **green hospital** additionally provides a healing environment for faster recovery and reduces hospital-acquired infections (HAI).

A **green hospital** has **intangible benefits** in the form of faster recovery of patients by 15% using **evidence-based design** principles utilising healing architectural aspects like natural daylight, green open spaces, healing gardens, colour psychology, connectivity to the outdoor environment and reduced average length of stay (ALS) of patients by 41% and emphasises infection control strategies with indoor air quality (IAQ). Tangible benefits like reduction in energy savings up to 30-40 %, with reference to the Energy Consumption Building Code and water savings up to 20-30 % with reference to the Uniform Plumbing Code, and thus eventually reduction in operation and maintenance costs.

The Indian Green Building Council, with the support of all the stakeholders associated with the healthcare industry, has launched the **IGBC Green Healthcare Facilities Rating System** to facilitate the **adoption of green measures in hospitals** (refer to [www.igbc.in](http://www.igbc.in)). The rating system is a holistic framework which enables a hospital to measure the current green performance and guides them to improve further on a continual basis.

**Smart Hospital** facilities having key feature of inter-operable system – people systems and processes- are connected and work seamlessly to ensure effective sharing of data and support integration of patient rooms, patient monitoring, smart devices, smart infrastructure, services management, patient management, OPD management and smart diagnostics and laboratories and smart operating theatres. These operate through **eHospital**, a digital platform connecting all hospital services in a single platform serving the purpose of smart hospitals.

Through the use of the Internet of things (**IoT**) and artificial intelligence (**AI**), a smart hospital can implement application systems based on the digital environment and people can obtain relevant service information accurately and fast. It also provides beneficial strategies for better education and training simulation among healthcare professionals.

Current technology enables doctors and patients to connect remotely and share information thru **tele-medicine**. Electronic medical record (**EMR**) with digital records requires minimum space and allows for easy restoration of documents. Radio frequency identification is a method of remotely storing and retrieving data using a device called Radio-Frequency Identification (**RFID**). **Crowd management** in a big hospital is a mix of many systems that are required to be coordinated side by side to reduce an undesired waiting period of the people employed in the system.

During COVID we learnt that a tele-consultation can reduce unnecessary crowds of OPD patients. There is also a need to build a call centre facility which can provide assistance in getting emergency facilities such as an ambulance or other life-saving facilities. This call centre will be the first point of contact for the patient which will control the visit of the patient as per the service slots available, ultimately reducing the patient visits to the facility.

Specific methods planned for new age crowd management in a healthcare set-up involves the following systems that are supported and incorporated in Hospital Information Management System (HIMS) software:

**SMART** hospitals have a comprehensive approach to infrastructure, modernisation, integration of digital and physical assets and resources across the environment for near-real-time data access and analysis. The vast amounts of data generated through this interconnectivity are used in intelligent ways to improve the quality of core processes of personalized and safe patient care and efficient high-performance operations. This increases operational efficiencies and optimises resource utilisation for better experiences and outcomes. The SMART hospital system which provide facilities are :

- Specific
- Measurable
- Achievable
- Realistic
- Time-Bound



Fig. 3: Launching of IGBC Healthcare Facilities Rating System in Green Building Congress 2016 in Mumbai



HIMS (Hospital Information Management System)



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Covid has taught us the importance of **environmental comfort** which can be through improved indoor air **quality (IAQ)** with a well-designed ventilation system and air filters to prevent airborne infection and nosocomial infection. Selection of anti-microbial material and specifications and scrupulous handwashing can substantially lower infection rates in hospitals.

The various technological method in use to reduce the risk of airborne infection, are :

- **Pressurization**- negative pressure in an isolation room with respect to surroundings or positive pressure in a procedure room with respect to surroundings.
- **Dilution**- where there is a high ventilation rate, air changes per hour (ACPH), controls particles by removal through ventilation.
- **Filtration**- the use of various kinds of air filters, such as pre-filter, MERV, HEPA filters, etc.
- **Purification**- you may trap all the pathogens by filtration but the filter can't destroy them. Hence the filter bank becomes a colony of pathogens. So it is necessary to destroy them by exposing them to UV radiation or ionization or various other methods available.



Crowd Management.

Noise is one of the important factors which affects the patients' well-being and stress levels. It was proved that in hospitals with lower noise levels, patients are more satisfied with their care, slept better, at lower blood pressure, and are less likely to be re-hospitalized. Similarly, the staff also have better job satisfaction and improved sleep quality. Hence It is also important to use a sound-absorbent ceiling and flooring to reduce noise which will lower the stress levels of patients and staff alike.

Tactile surfaces are the most vulnerable to spread of infection, that is, door handles, grab bars, bed rails, IV fluid stands, etc. **Antimicrobial copper** is the most effective touch surface material, killing greater than 99% of bacteria within two hours of exposure. Copper and copper alloys have intrinsic antimicrobial properties with well-documented efficacy against a wide range of pathogens.

**Adaptable flexibility** means spaces can be designed to adapt to multiple uses and planned to serve a range of possibilities. They should also have **convertible flexibility**, with low space, time and cost. Space can be converted into other uses. That's how during the pandemic, the hospitals which followed these principles could convert COVID wards into critical care.

#### INITIATIVES THAT ARE MOVING FORWARD

##### PM Ayushman Bharat Health Infrastructure Mission (PM ABHIM)

The COVID 19 pandemic opened our eyes by exposing our healthcare infrastructure's need for beds, ICUs and testing facilities, food and drug regulations, oxygen supply and ventilators. At the same time high cost of care, persistent health inequalities, reduced access to essential services to people in remote areas and a shortage of trained human resources. With weak health systems, it is difficult to face the challenges of managing COVID and non-COVID essential health services.

To address the externalities, public health action, including health promotion and prevention, India's largest pan-India health infrastructure scheme **PM Ayushman Bharat Health Infrastructure Mission (PM ABHIM)** was launched in October 2021 with an intention to bring about a paradigm shift in India's healthcare infrastructure and make it more resilient addition to the National Health Mission (NHM) which caters to needs of both the urban and rural populations.



The objective of PM ABHIM is basically to strengthen grassroots public health institutions and public health governance capacities to face the current and future pandemics with comprehensive diagnostics and critical care treatment with an IT-enabled disease surveillance system by establishing a network of surveillance laboratories at block, district, regional and national levels.

Though these guidelines define the deliverables and ways and means to achieve the same, are recommendatory and a first step towards the goal of universal healthcare.

A way forward to 'One Nation and One Health ID card' is through the *National Digital Health Mission (NDHM)* with the introduction of a digital health ID card.

The journey, moving from designing for healthcare infrastructure to designing for holistic healthcare, will succeed when all the initiatives work together with precision and dedication. While the rapid growth of technology will speed up the journey, it will not succeed without an active mindset of development that focuses on the best outcomes for the patients and the environment.



##### Prof. (Dr.) R. Chandrashekhar

Chairman, IGBC Green Healthcare Facilities & Advisor – HLL Lifecare Ltd and Former Chief Architect, Ministry of Health, Govt of India 33 years of experience in Healthcare Planning & Designing various Hospitals, Medical college, Healthcare Infrastructure, Speciality & Multispeciality hospitals, Project Management & advising Ministry of Health Govt. of India in Technical & policy Issues. Member of Technical committee of PMSSY (Pradhan Mantri Swasthya Suraksha Yojna) in setting up Six AIIMS Like institution in the country & 26 Existing Medical Colleges to be upgraded to same level in Phase I & II and 39 Medical college up gradation in Phase III. Setting up NIPS & RIPS (National & Regional Institute of Paramedics) in various states of INDIA. Setting up of State of Art Metro Blood Bank in Four Metros. Redevelopment of LHMC & Associate Hospitals and Safdarjung Hospital in New Delhi.  
chandrashekhar\_54@yahoo.co.in

# THE GLENEAGLES CHENGDU HOSPITAL, CHINA

Ar. Brinda Sengupta

## Fact File

- Area ▶ 51,500 square meters of gross floor area, 350 beds, Brownfield project
- Design Scope ▶ Medical planning and interiors for a 50,000 sqm, 350-bed hospital
- Programme ▶ Departments of Internal Medicine, Surgery, Obstetrics and Gynecology, Pediatrics, Ophthalmology, Otolaryngology, Stomatology, TCM, Dermatology, Psychology, Pain Treatment, Child Health Care, Women's Health Care, Emergency Medicine, Laboratory Services and Medical Imaging Centre, etc.
- Completion ▶ 2019



Figure 1: A community anchor welcoming patients with a hospitality like environment

We at HKS believe that the future state of healthcare should cater to our entire spectrum of needs. Health must be embedded in how we live, work, play, and beyond the hospital or clinic. Healthcare buildings need to be viewed in the overall urban context, plugging into the extensive urban infrastructure and giving back to their immediate environment. After the COVID 19 pandemic, the integration of design and health has become even more apparent both within and outside the hospital.

The Gleneagles Chengdu Hospital is the first general hospital established by Parkway Pantai in Mainland China, and the first comprehensive medical institution of Sino-foreign joint venture approved by Sichuan Development and Reform Commission.

Completed in 2019, the project is sought to provide easily accessible health care for the region's 150 million residents. Renovating a shopping mall structure to design a hospital was not an easy task and posed several challenges. However, the team successfully overcame the challenges and maximised the project's potential.

### **Hospital as an anchor for the community**

Its central location and proximity to rapid transportation radically improve the convenience for patients travelling from other cities across the province, increasing the likelihood of residents taking control of their health and well-being.

We held extensive meetings with investors and government officials on infection control, and facilitated workshops with community leaders, listening to their concerns, enabling us to provide them with the best healthcare services.

We wanted the hospital to go beyond being a healthcare provider to a catalyst for the community. We invited local artists to display their work around the hospital, bridging locals with hospital patients and staff.

### **Healing gardens within the hospital**

HKS understands the importance of biophilia in helping patients recover faster. However, for a brownfield project, this was difficult. With a careful understanding of the existing structure, the team carved out courtyards, green spaces and healing gardens. Patient rooms were also able to be fitted with balconies for visual access to nature.

### **Sustainable design**

Gleneagles Chengdu Hospital was fitted out in what used to be a shopping mall when sold to Parkway Pantai. Instead of demolition and building a new piece of architecture, HKS worked within the available means and made use of the existing shopping mall and planned it as the new, first comprehensive medical institution and first general hospital in China by Parkway Pantai, providing residents with easily accessible healthcare. Energy consumption has been cut as the building has been extensively fitted with full glass windows which are shaded yet allow an abundance of

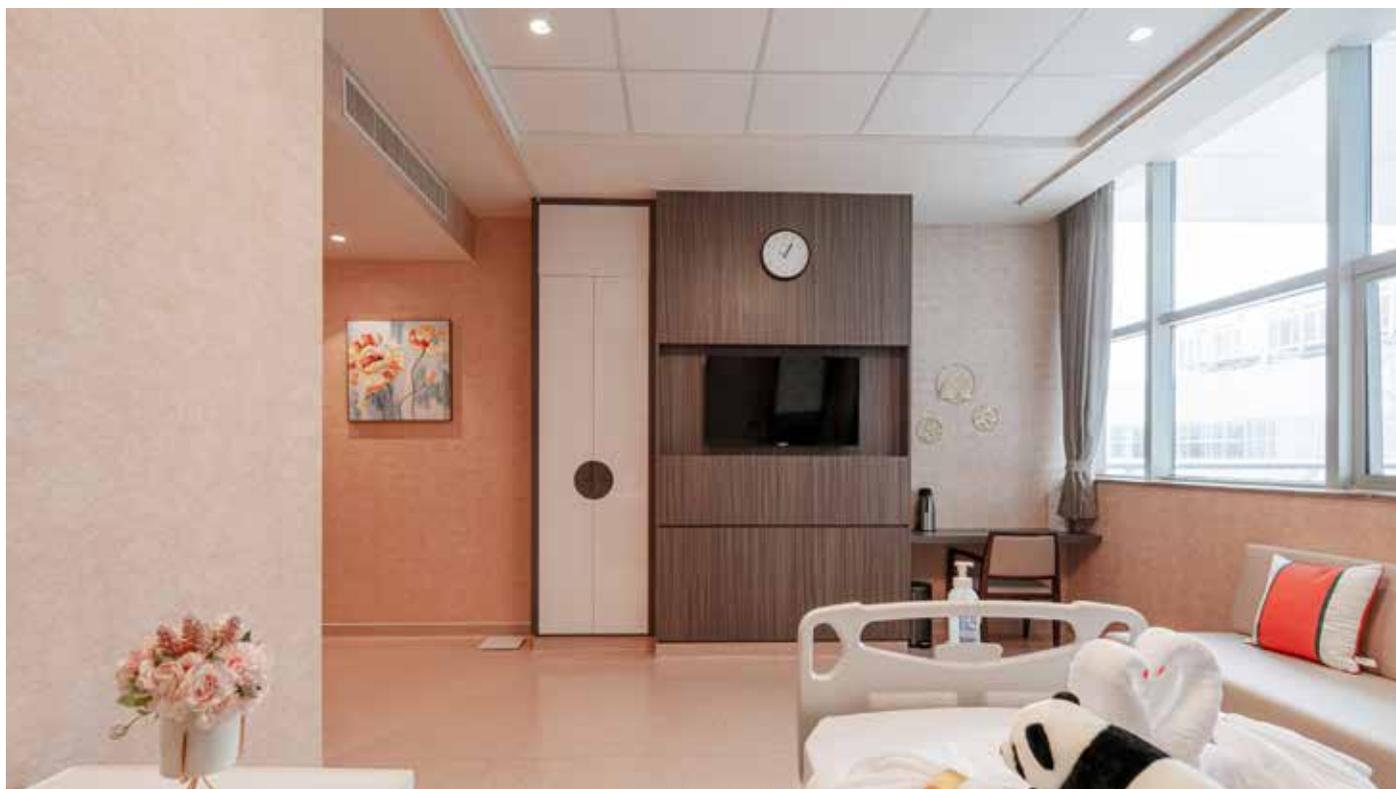


Figure 2: Artwork to elevate patient comfort and promote local artists



Figure 3: Healing gardens and courtyards for patient and staff comfort and well being



Figure 4: Natural daylight for patient comfort and energy savings.



Figure 5: Natural and locally sourced materials such as marble and wood veneers

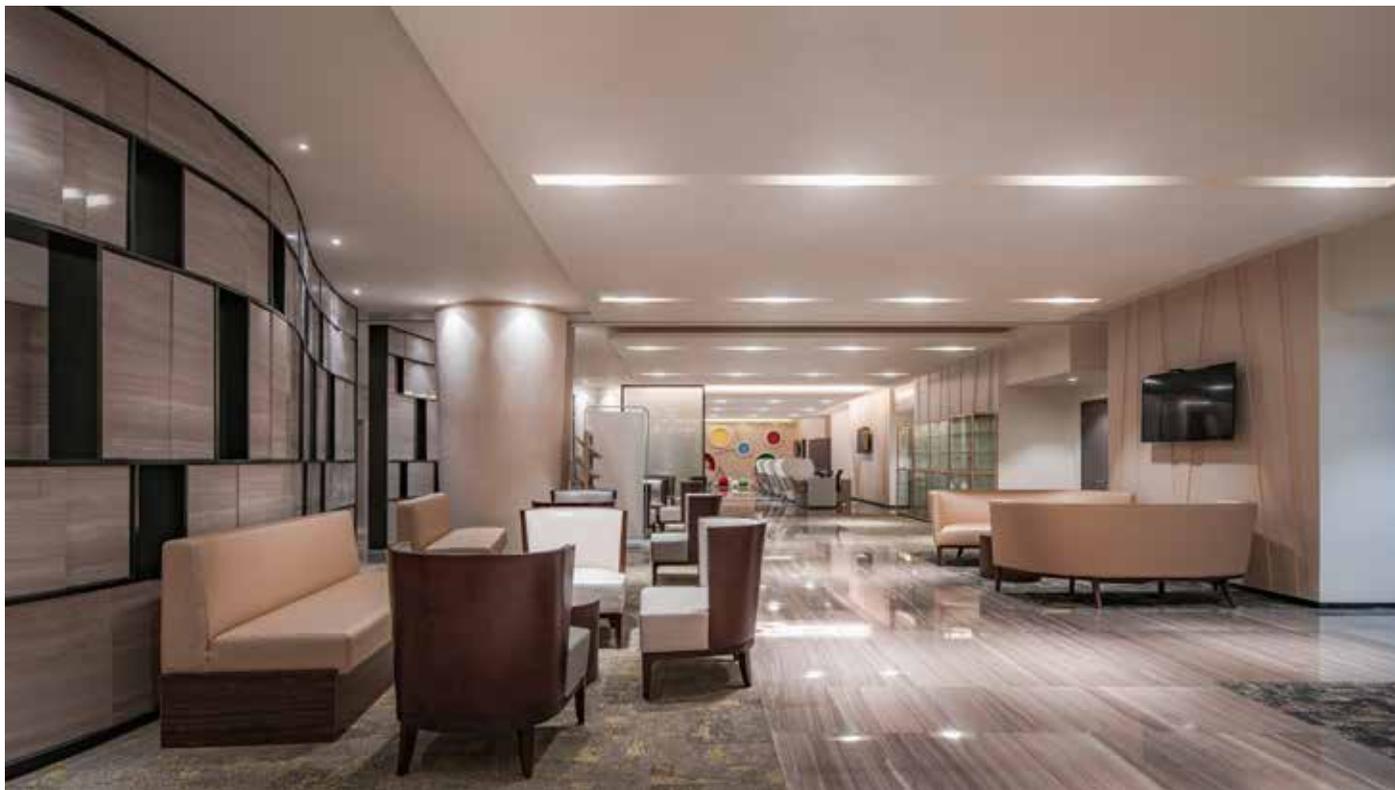


Figure 6: Waiting area for Outpatient clinics can be segregated into different clusters or combined as a common waiting area for flexibility

daylight filtering into the hospital, contributing to lesser electricity costs and benefits for patients. Natural daylight is an environmental factor that has a great impact on the health and well-being of people within a space. Products that make up the interiors are sourced locally to keep freight/shipping transportation CO2 emission to a minimum.

#### **Flexibility and future readiness.**

Change is inevitable in a healthcare facility and is caused by a variety of drivers. Health facilities are seeing a new set of consumer expectations in the delivery of care. Rapid advancements in diagnostic tools and technology demand an ever-changing amount of space and infrastructure. Healthcare systems are looking to the built environment as a tool for organizational change and a well-designed environment can facilitate collaboration, education, research and care delivery. A modular design approach ensures easy modification as needed.

The designed product ensured that changes can be thoroughly and smoothly implemented and that the lasting benefits of up to fifty years are achieved. Any work done to Gleneagles Chengdu Hospital will not affect the future structurally, aesthetically or organization. Thus, the design prepares them for future pandemics and upgrades.

The health of the environment is closely intertwined with the health of human beings. Infection control cannot be merely looked at in isolation. Resilience is what we all need

to strive for in the design of designing our homes, clinics, hospitals, and extended habitats to cope with natural disasters, pandemics, and other emergencies.

We hope we will be able to demonstrate the integration of sustainability, healthcare and wellness in our future projects and build on our learnings from the Gleneagles Chengdu Hospital.



**Ar Brinda Sengupta** is an architect and an urban designer with over 14 years of international work experience. With a Masters of Urban Design, from University of California, Berkeley and a B.Arch. from TVB School of Habitat Studies, New Delhi, India, she aspires to see the integration of public health and design to create healthy and vibrant buildings and communities. She is currently Vice President at HKS Singapore Pte Ltd., a firm with over 80 years of experience designing healthcare facilities. Brinda enjoys working on projects in India, the Middle East and Singapore which give her a diverse perspective on design. Her current projects include the Phase 2 expansion of King's College Hospital, Dubai and SSMC Mayo Hospital renovation in Abu Dhabi. [bsengupta@hksinc.com](mailto:bsengupta@hksinc.com)

# MEDICAL COLLEGE AND HOSPITAL

## RAJASTHAN UNIVERSITY OF HEALTH SCIENCES, JAIPUR

By Design Architects

Hospital Attrium



**Fact File**

Project	► Medical college with 100 intake and 500-bedded hospital for Rajasthan University of Health Sciences at Pratap Nagar, Jaipur.
Client	► Rajasthan University of Health Sciences, Jaipur.
Execution Agency	► Rajasthan State Road Development & Construction Corp. Ltd.
Cost of the Project	► 324 crores INR
Date of Start	► August 2014
Date of Completion	► August 2018.
Total land area	► 1,21,000.00 sqm (13,01,960.00 sft)
Total ground coverage	► 30,341.5 sqm (25.07 %)
Total parking	► 885 cars & 885 two-wheelers
Total constructed area	► 1,15,863.60 sqm

**INTRODUCTION:**

The medical college and 500-bedded hospital for Rajasthan University of Health Sciences at Pratap Nagar are located in the southern part of Jaipur. They have become the hub for healthcare facilities in the Pink City and the state. While conceptualising the campus, the focus was to develop spaces to feel comfortable, pleasant, and energetic to stay in for students, staff, patients, attendants and visitors. These aspects are achieved by adequately amalgamating the typical desert behaviour of Rajasthan and nurturing green areas with the planning of unified building elements. In phase -1 the hospital has been constructed for 500 beds with future expansion for 1000 more beds.

**PROGRAM:**

The seed of the programmatic layout lay in providing an environment that fully meets the aspirations of academics, professional excellence and holistic healthcare. Considering the climate and immediate surroundings, constructing an

unprecedented campus with an upbeat visual and spatial vocabulary, yet respecting the heritage-based city fabric of Jaipur was achieved with the help of appropriate materials and grand forms, giving the campus a unique blended environment.

While offering the best and most modern environment for executing healthcare activities, the campus is designed to meet international trends and standards. The campus was designed and constructed as per the latest norms, local building bye-laws, design concepts, and environmental concerns. It has a definite character and a predominant treatment style throughout its buildings and other elements while accommodating physically disabled requirements with horizontal and vertical movement, utilities, toilets and other facilities as per BIS standards and accessibility guidelines.

Situated in the hot climate of Jaipur, the internal heat load-dominated blocks, due to high occupancy, are designed with a rectangular mass and thinner floor areas to provide adequate natural ventilation, lowering cooling costs and keeping the air circulation. The ramp wells with apertures and atriums favour the effects of the stack ventilation technique, which provides internal air movement inside the building through the circular intakes supplied on the facade.

**RESEARCH:**

The process for research and data collection for the hospital, academic and residential blocks was supported by rounds of meetings with client departments, interactions, international journals and creative conceptualizing. The synergy of the hospital block with its supporting programs in a straightforward manner was the priority in the planning of the space and corresponding adjacencies. Using international projects as a precedent helped us to realize the significance of specific areas uncommon in the Indian healthcare contexts for academic and hospital development plans. Such an example is an attached attendant rest area adjacent to IPD. wards. The segregation of clean and dirty areas dictates the hospital's internal layout for multiple floors.



Hospital external view



Hospital Front &amp; side Elevation

The site was studied with respect to nine parameters and divided into three segments using observations, analysis, and conclusions. JDA bye-laws, NBC guidelines, norms of the Medical Council of India, NABH, ISCCM guidelines and accreditation rules laid down the driving rules for developing the project.

#### **MASTER PLANNING:**

Conceptualizing the master plan, considering contours and requirements, the total campus was divided in four major divisions: (a) Academic (b) Hospital © Residential (d) Services.

To minimize the inter-dependability for each category, separate entries have been proposed on the campus. The zoning has been designed in such a way that these components will have proper segregation of private and public areas and will enjoy complete independence at all times without any adverse effect on the functioning of

these components in a combined manner. 15 m wide entry roads for the campus, 12 m and 9 m wide internal roads with sufficient pedestrian walkways all around the roadsides help to reduce carbon footprints further and save energy. Providing more footpaths covered with green creepers enhances the aesthetics of the campus.

At terminations of drainage network as per contour plan and other services, undulating forms of dunes have been created, which are various green mounds of five feet in height that help to reduce the visibility of parking, sewage treatment plants, electrical substations and rainwater harvesting pits and increase the visibility of green areas, which adds to the healing atmosphere of the campus.

#### **ARCHITECTURAL DECISION:**

Architecture and a designed environment are of the utmost in promoting a certain level of independence, which the young professional must carry forward after graduation. While planning the hospital block for this campus, there was a specific focus on the psychological condition of patients: the hospital was designed in such a way that it is more comfortable and the relaxing spaces will lead to better recovery and reduce mental stress levels.

“Part of the best care might be keeping people calm, giving them space to be alone- things that might seem frivolous but are really important.” says Annmarie Adams, a professor at McGill University who studies the history of hospital architecture. Such subliminal effects of a well-designed environment help to promote systematic thinking in the minds by sowing seeds for a healthy nation.

#### **HOSPITAL PROGRAM**

The hospital has a basement over which 11 storeys of programme exist in the form of functional clusters. The zones have been organized according to the hospital's type, functions, performance, and requirements. OPD, emergency, investigation, radiology, IPD, ICU, operation theatres, cottages, stores, services and other supporting rooms, are arranged in the layout to correlate their tasks, processes, and proximity to the scheme of the hospital as a whole. Similar and dissimilar grouping principles in the hospital's planning helped to set various building utilities according to their inter-relationships.



Hospital Front Elevation



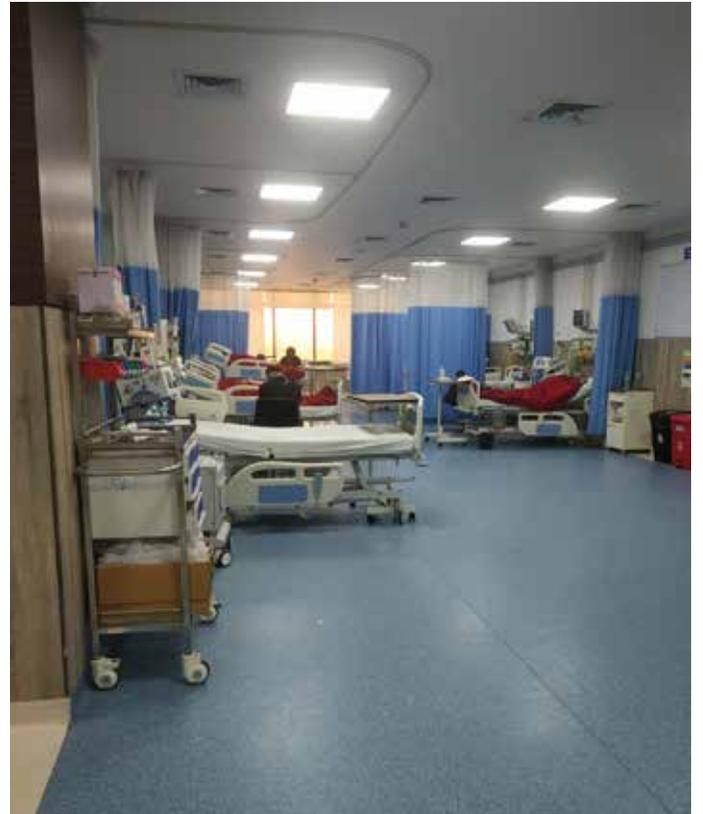
FIRST FLOOR PLAN

500 Bedded Ruhs Hospital 1st floor plan

### MASTER PLAN



Ruhs Master Plan



**Top:** Hospital Waiting Area  
**Bottom:** ICU CORRIDOR

**Top:** Hospital Lobby first floor  
**Bottom:** ICU

The basement has services such as pharmacy, stores, record room, Central Sterile Services Department (CSSD), kitchen, laundry, manifold room, electrical room and also the radiology department such as X-ray, sonography, MRI, CT scan, etc. with thickened walls to prevent the leakage of harmful rays beyond the building envelope.

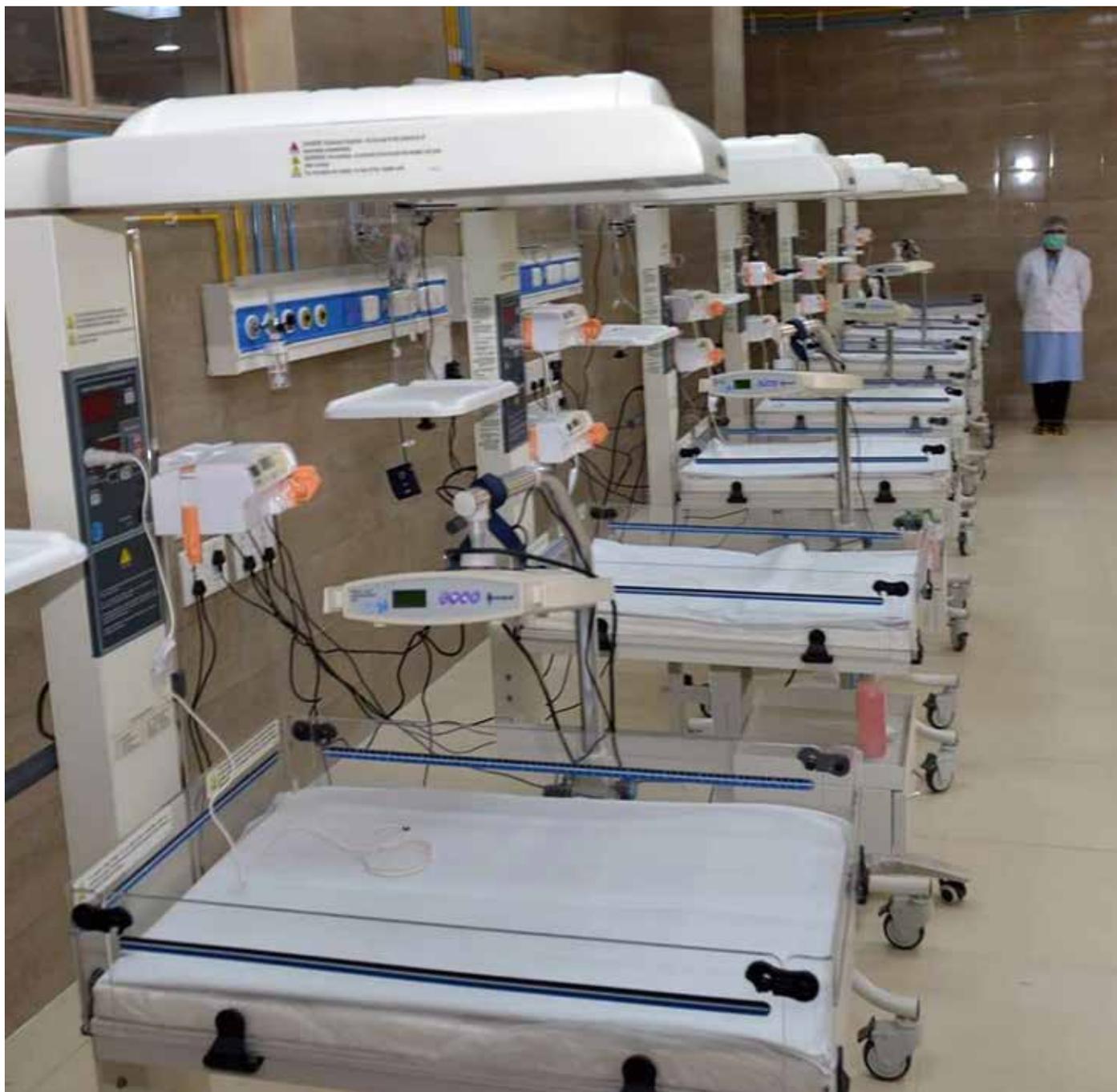
The CSSD is equipped with ultra-modern, microprocessor-controlled autoclaves, washing bays, ultrasonic cleaners and dryers.

State-of-art central waiting plaza and OPD areas accommodate patients and attendants waiting in queues,

computerized central registration, audio-video displays of the patients' turns, medical awareness, digital display of signage and facilities, public announcement system and CCTV monitoring.

24-hour emergency services with separate entrances and parking to disallow the intermixing of incoming patient inflow both at the external and internal spaces of the hospital block.

Administration services with public interacting offices are on the ground floor with a separate entry to avoid unnecessary visitors inside the admin area. There are sensor



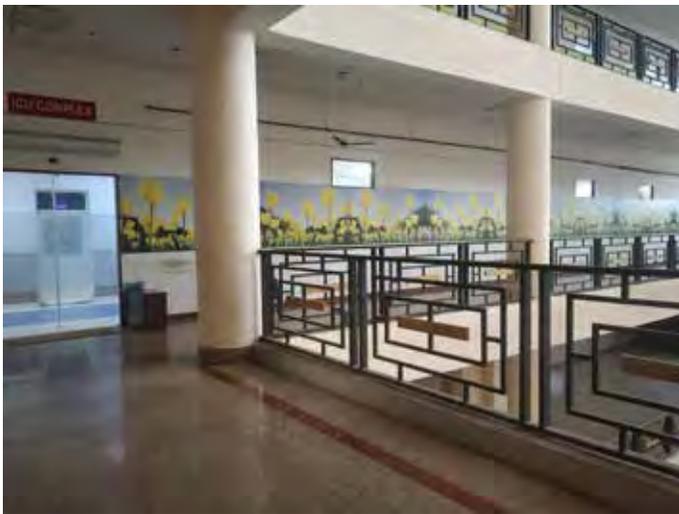
NICU

and timer-based systems for energy and time-saving. All non-interacting offices are on the basement floor like records, processing, stores, etc.

The ground floor is divided into four zones to facilitate transient and static traffic to create minimal travel times for patients and staff: OPD wing, emergency, central laboratories and the administrative department.

The outpatient department in any hospital is considered to be the shop window of the hospital. There are various problems faced by the patients in an outpatient department like overcrowding, delay in consultation, lack of proper

guidance, etc. that lead to patient dissatisfaction. Nowadays, patients are looking for hassle-free and quick services in this fast-moving world. This is only possible with the optimum utilization of resources through multitasking in a single window system in the OPD for better services. All these problems have been taken care of while designing the OPD wing. Thanks to the central and state governments, the fundamental right of free medical checkups and the distribution of free medicines to the required patients are implemented. Separate drug distribution counters have been proposed with the OPD block. Few OPDs are also stacked above, on the first floor.



**Top:** OPD Waiting First Floor  
**Bottom:** Second Floor ICU

**Top:** OPD Waiting Ground Floor  
**Bottom:** TRAUMA

The Emergency Department has been segregated into red yellow and green zones, counselling rooms for distressed attendants. OTs and ICUs in the emergency as per NMC and ISCCMM guidelines and patient load supported with large waiting areas with adequate facility areas have been planned to strengthen the Emergency. Behind the Emergency Dept. space for future expansion of the hospital has been proposed. Thus Emergency has been planned in such a way expansion of Emergency and IPD tower can be done without disturbing the present status.

The central laboratories designed on the ground floor for efficient processing from the sample collection areas host biochemistry, pathology, microbiology, haematology, histology, and cytology labs with sample collection and computerized reports delivered directly to concerned OPDs and to the relevant departments.

Administratively, the success of a hospital is a combination of Infrastructure and the skill of the staff. For that, to develop a programme to recognize medical practices as patient-centred hospitals, which focus on improved access, enhanced communication, better tracking and care management, electronic recordkeeping and prescribing, and performance measure reporting. Developing patient-

friendly and impartial services with quality management is the essence of a successful hospital.

The Intensive Care is a dedicated unit for critically ill patients who require invasive life support, high levels of medical and nursing care and complex treatment. The intensive care unit provides a concentration of clinical expertise and technological and therapeutic resources which are coordinated to care for critically ill patients.

Thus while conceptualizing the ICUs, we visited different types and levels of ICUs to understand prevailing practices, aspirations and challenges. Several face-to-face meetings of the expert committee members in big and small groups with extensive discussions, presentations, brainstorming and development of an initial consensus draft. All ICUs are equipped with reception, 24x7 laboratory, attendants waiting and restrooms, Procedure room and separate cubicles and single patient bedrooms including isolation rooms have minimum dimensions of 3.9 x 3.9 metres.

The intensive care on the second floor has 58 cubicles with modern and rich specifications, antistatic flooring, automatic doors, computerized monitoring, bacteria-proof wall cladding, and similar specifications required per the



Hospital Main Entrance

medical norms. The ICUs are divided as per the various levels of critical nature of patients. The ICUs are well connected with OTs and the Emergency area.

Ten modular OTs and labour rooms are accommodated with an access control system on the third floor with services like change rooms, staff rooms, stores, anaesthetists, preoperative ward, postoperative ward and waiting areas to economize the most expensive facility of the hospital. A rest/waiting area with lockers for attendants is provided with wards to avoid unnecessary circulation in the hospital.

The In-patient Department has minimum traffic disturbance with sixteen wards (30-beds each) on eight floors (2nd to 9th floors) with a total capacity of 500 beds with separate entries. On the 10th floor, there are ten single-bedded private rooms and nine double-bedded private rooms.

Timers and sensor-based lighting are used to curb unnecessary waste of energy. The central gas supply line system has been proposed in the basement and connected with the main server. Solar heated water supply is used for hot water supply on the campus. All vertical floors are connected by staircases, freight elevators, ramps and dumping chutes.

To summarize the massive integrated project, the design and location of spaces within the campus correspond to circulation within the campus for a specific time limit and interconnectivity of frequently associated departments. With the use of well-ventilated rooms and wide corridors, the external views of the buildings are visible from the inside of the block, creating a sense of connectedness with the bigger

whole. The project also provides flexibility in terms of space planning, promoting the possibility of expansion at any time. It becomes possible to satisfy needs when the occasion arises with minor adjustments. Such an example occurred during the COVID 19 surge when 1200 beds were accommodated in this hospital due to the spatial properties of the project. The economy is a significant factor in building planning to fit the proposed scheme within the limited resources and funds. An architect and team of engineers must know in advance from the concept planning stage what the limitations are. As an architectural challenge, while considering the economy, the required impression of the project was enhanced with the given constraints.



**Ar. Ritu Singh** is the Proprietor of "DESIGN ARCHITECTS" started in 2001. She has designed many prestigious Projects in Rajasthan and other states during the last two decades. She was awarded for excellent performance in architectural services by Rajasthan Urban Improvement Development Project (RUIDP). She was also awarded for excellent performance in architectural services on the 75th Independence Day by the Rajasthan Government. She is the representative for Govt. of Rajasthan in the Council of Architecture (COA).  
designarchitectsindia@yahoo.com

# MEDANTA SN SUPER SPECIALTY HOSPITAL, SRI GANGANAGAR

Ar. Shamit Manchanda



Exterior View

**Fact File**

Name of the project	▶ Medanta SN Super Specialty Hospital, Sri Ganganagar
Client	▶ S N Super Specialty Hospital Pvt. Ltd.
Architects	▶ Manchanda Associates, New Delhi
Design team	▶ R.C. Manchanda, Shamit Manchanda, Lalit Pandey

*Consultants:*

Structure	▶ Charu Engineering Consultants
MEP	▶ V Consulting
Civil Project Mangers	▶ Mr. Ved Pal, Mr. Ajeet Singh
Built-up area	▶ 1,65,000 sft (approx.)
Cost of project	▶ 72 Crore INR
Year of completion	▶ 2018

**PROJECT DESCRIPTION****CONTEXT**

The demand for quality healthcare in Tier 2 towns has been rising in the last few years. Foreseeing the advantage of being the first movers, the management of Sihag Hospital in Sri Ganganagar, envisioned the idea of setting up a 200-bedded super-speciality hospital. Located on the outskirts of Sri Ganganagar, on the Suratgarh-Hanumangarh Bypass Road on a 3-acre plot of land, the brief for the architects was to set up an ultra-modern facility with the possibility of expansion to take it to 300 beds, while keeping in mind budgetary constraints.

**EFFICIENT PLANNING**

Natural light and ventilation are essential elements for designing any building, especially hospitals. A lot of hospitals are being planned today with central air-conditioning. But that does not mean sacrificing these crucial elements. The hospital was planned in an H-shaped pattern ensuring natural light and natural ventilation for almost all areas. The H-shape helped in creating distinct zones for segregating independent departments while keeping the vertical circulation central. This ensured easy and unobstructed movement of patients, doctors and visitors, which is of prime importance in the functioning of any hospital. The H-shape also enabled the provision for an additional block for future expansion. A ramp has been provided to connect all levels for the convenience of physically handicapped persons as well as for the evacuation of patients in case of fire.

**SPATIAL INTER-RELATIONSHIPS**

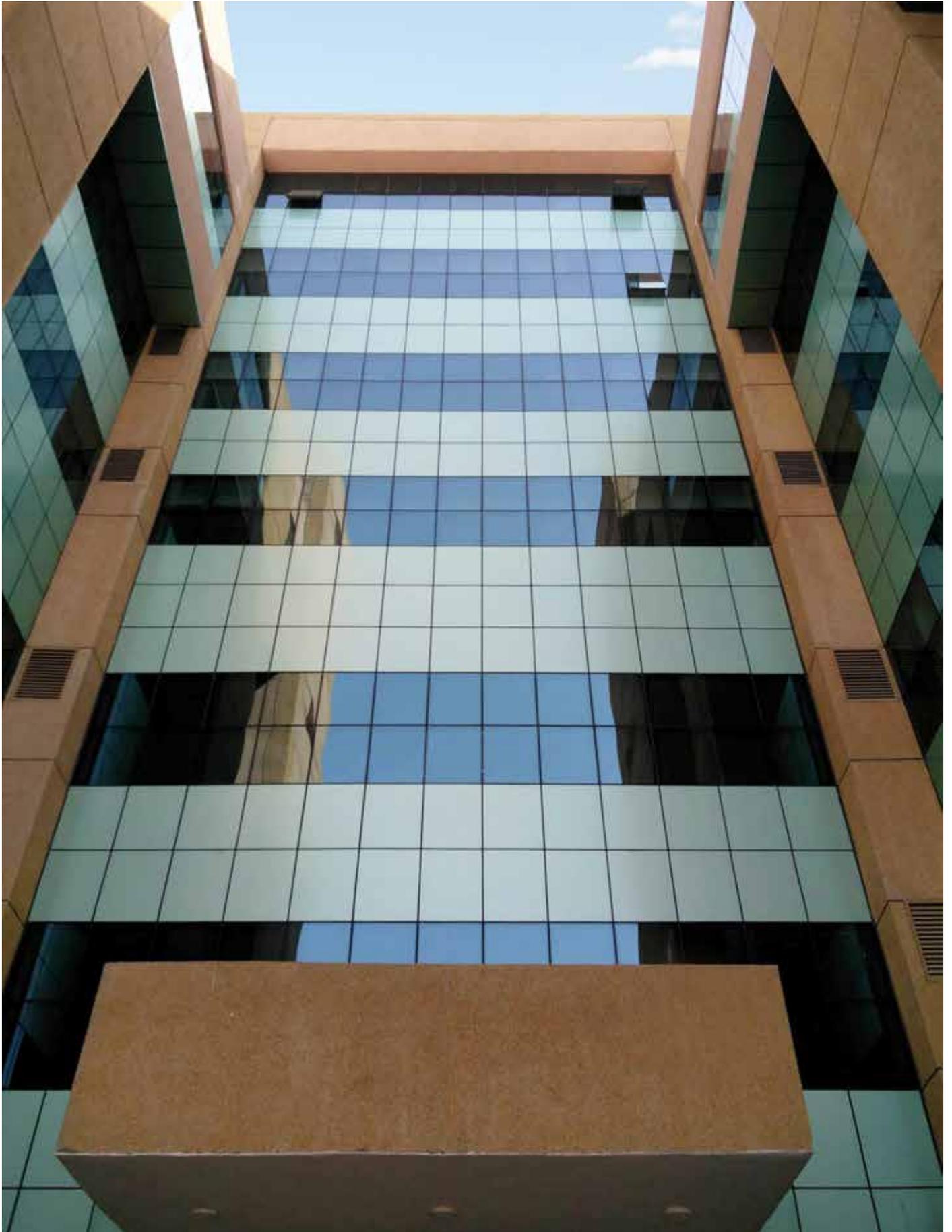
The spatial inter-relationship of various functions within a floor and between floors becomes paramount for the

efficient functioning of a hospital. The major public zones were restricted to the ground and first floors comprising the OPD, Emergency and Radiology on the ground floor and part OPD, Dialysis Centre and ICU in a separate wing on the first floor. The second floor houses the Pathology Department and Administration in one wing and wards in the other. The third floor is entirely dedicated to operation theatres and allied services like CSSD and blood bank. The fourth floor comprises the Pediatric, Gynaecology and Obstetrics Departments along with a Birthing Centre and a Neonatal ICU. The fourth and fifth floors are totally dedicated to the private wards.

**MODULAR & FLEXIBLE PLANNING: COMMON STRUCTURAL GRID**

The planning of the building has been based on a 6.6 x 6.6-metre grid with 3 metres of internal corridor space. These dimensions are within the recommended norms for hospital buildings and meet most of the requirements essential for various functions. It can accommodate an operation theatre, a six-bedded general ward in one unit, two single-bedded private wards with attached toilets or two reasonably sized rooms for doctors, nurses/staff change rooms, etc.

The floor-to-floor height has been kept as 3.6 m with 4.2 m clear height for the OT floor to allow for additional space for numerous services. All floors have beam-free corridors to facilitate the running of services above the false ceilings. While designing the services for this hospital one thing was clear – the systems have to be robust and easily maintainable – keeping in mind the lack of availability of trained manpower in the area. Any breakdown would require a company service engineer to come from another city.



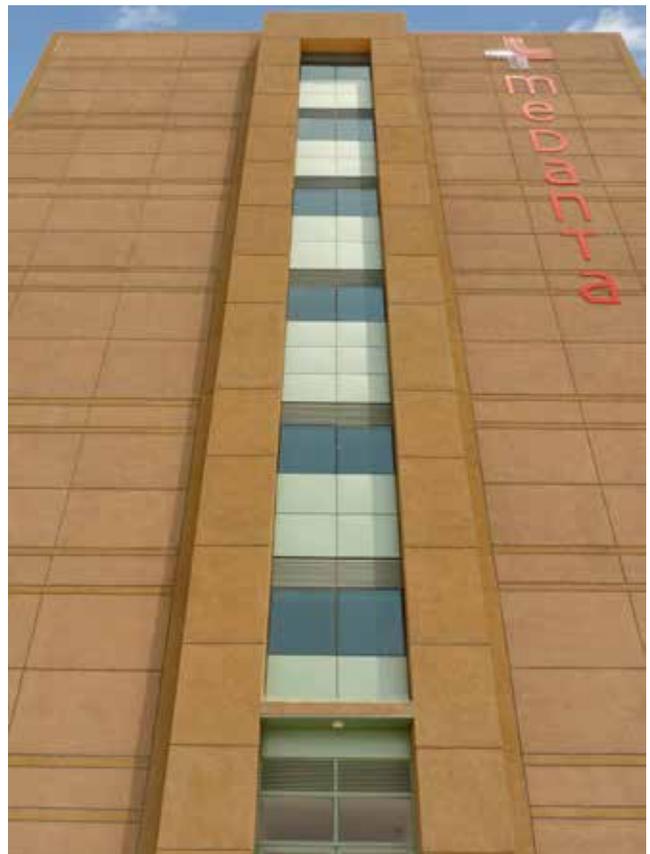
Worm's eye view, right before entering the Emergency Department. Both wings of the hospital mutually shade the building.



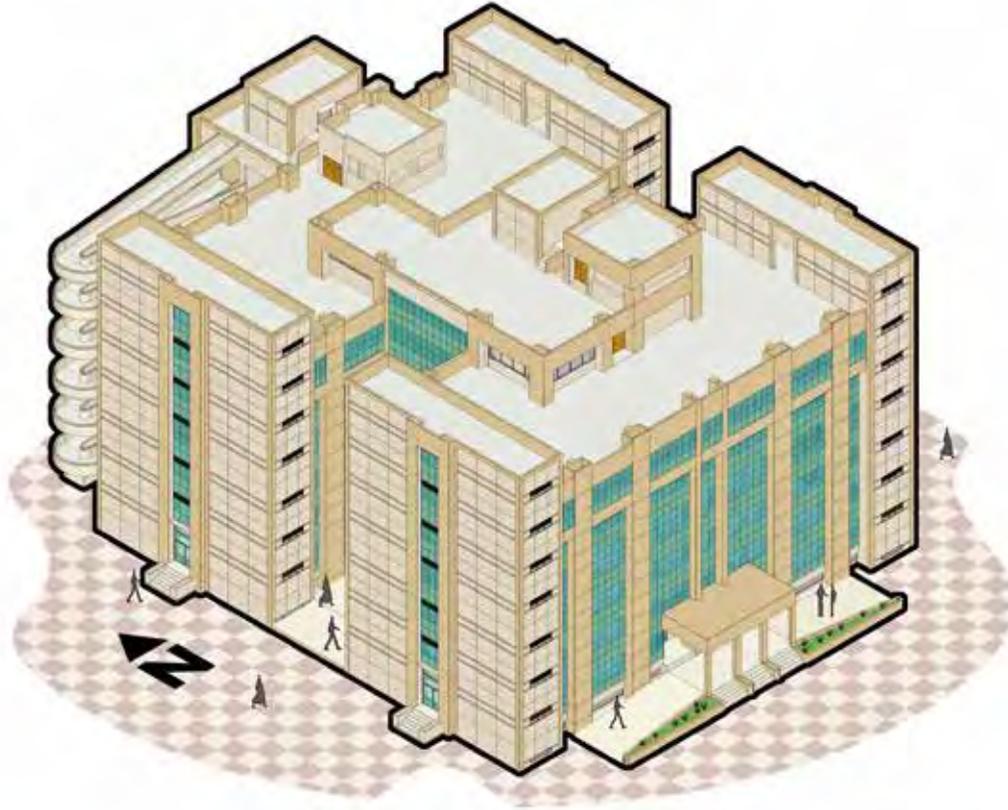
View of the Hospital from the Parking



View of one of the wings



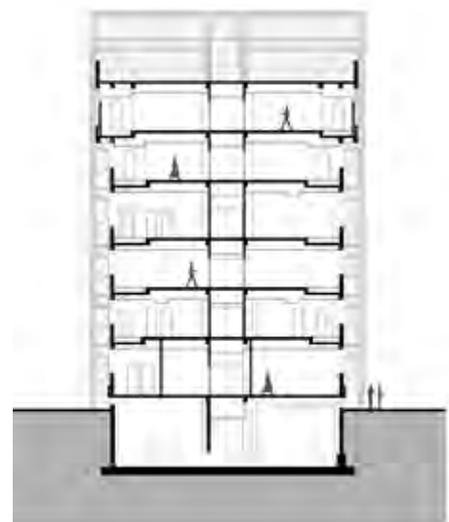
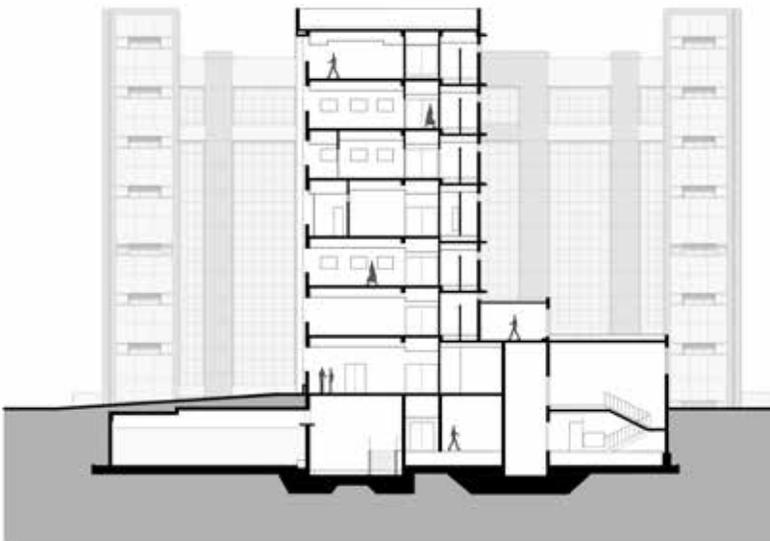
Worm's eye view



3D View



Elevation



Section



A double-height Emergency Reception makes for a less claustrophobic entry to the Hospital



View of the Dialysis Room



Emergency Triage Area



Operation theatre



View of the Emergency Entry of the Hospital

### **SUSTAINABILITY MEASURES**

Though the project did not undergo any green rating system, systems have been adopted to make the building green, sustainable and energy efficient. The orientation of the buildings is such that glazing is maximized on the north and south faces while effectively blocking the hot sun on the eastern and western faces. The H-shape ensures natural light and ventilation to almost the entire building while still offering mutual shade to cut down the heat.

### **ENERGY EFFICIENCY SYSTEMS**

- Use of solar panels both for heating water and power generation
- Use of energy-efficient insulated glass to minimize heat gain while still maintaining large glazing for increasing day-lighting within buildings
- Waste-water recycling and reuse for flushing, HVAC make-up and horticulture from STP
- Use of variable frequency drives and high-efficiency screw type chillers

### **BROAD SPECIFICATIONS**

Hospital walls, floor finishes and other such elements require two very important basic premises: they should be low on maintenance and should prevent breed infection. To achieve this, we used the following:

- Seamless floors in clinical and critical areas by using anti-bacterial vinyl flooring with coved corners.
- Large-sized ceramic tiles to minimize joints
- Vitrified tiles for floors in hospital areas
- Kota and granite for service areas and staircases
- Modular OTs with laminar flow and state-of-the-art equipment and facilities with anti-bacterial coated walls and floorings.

- Sensor-operated stainless steel scrubs and hermetically sealed doors.
- Doors consist of laminated shutters fixed in aluminium frames with stainless steel fittings and fixtures.
- Windows and structural glazing in aluminium with insulated and energy-efficient double-glazed units to reduce heat gain

### **ELEVATIONAL TREATMENT**

The façade of the building is interspersed with transparent and opaque elements composed of large glass panels and solid shafts. The two-tone grit finish created using Dhoolpur and Jaisalmer stone not only provides a permanent finish but also gives the hospital a sharp look while creating an array of clean lines throughout the elevation.



**Ar. Shamit Manchanda** is a 1989 Graduate in Architecture from the School of Planning & Architecture, New Delhi. He is Partner and Chief Healthcare Architect in the firm Manchanda Associates which specializes in Healthcare Architecture. He is the Former Chairman, Northern Chapter of The Indian Institute of Architects. He has also served as member on the Central Vista Committee from 2015 to 2019 and Governing Council of School of Planning and Architecture, New Delhi from 2009 until 2014. [shamit@manchanda.co.in](mailto:shamit@manchanda.co.in)

# ARRIS ATELIER

Ar. Ankur Yadav, Ar. Anuj Khandelwal, Ar. Artika Aggarwal & Ar. Varun Seth

## **Philosophy**

Early 2020, before the world as we knew it changed, four friends, all graduates from the School of Planning and Architecture, Delhi, got together and decided to pool their strengths and talents together to make good design accessible. Thus, Arris Atelier was born. The studio, since its inception, has sought to be genre and style agnostic, in a bid to always put the user, space and context first.

The firm capitalizes on the varied nature of offices and institutes the partners have worked with in the past, ranging from niche boutique firms to developers and MNCs and academic bodies, to develop a design philosophy that builds on research, social responsibility and public impact. With our varied academic backgrounds, we are also able to apply our services in the realms of project management, urban design, graphic design and interiors, while working on projects across categories of residential, institutional, commercial, retail, healthcare and hospitality.

The principals are consistently engaged with academic bodies, and also serve as visiting faculty at SPA, Delhi,

focusing on creating strong interfaces between academic design and industry application. This collaboration also keeps us abreast of the latest developments in the design space, making sure our design solutions are well-informed, inclusive, wellness-focused and holistic. Our work spans across all categories of design and construction projects, without being limited to a house style. Every solution is uniquely designed keeping the client in mind. The focus is to maximize function while creating visual interest and ease of use.

## **Designing For Wellness**

Varun and Artika both come from medical families. Varun took this exposure forward into research during college, and then in practice. For Artika, this led to her taking an active role in the healthcare practice at her previous place of employment at HKS India, where she got the opportunity to work on hospitals across India, Southeast Asia and the Middle east. Building on these experiences has been instrumental in helping the firm develop a strong healthcare-focused practice, with a mind to create spaces that prioritize wellness for everyone.

### **Wellness for people**

Designing a few individual and multi-specialty clinics led us to our first hospital client, Mata Chanan Devi Hospital, where we were tasked with conceptualizing, detailing and guiding the renovation of an Intensive Care Unit for the 210-bedded hospital in Delhi. Since this was located next to another functional ICU, our first challenge was to plan the execution of the project in a manner so as to minimize operational disturbances and maximize infection control. Our design explored ways of improving the department through principles of careful layout planning, infection control and promoting a healing environment. Ease of use, flexibility and creating a humane environment were key concepts applied to the space, while being mindful of the complexity of services, including the medical lines necessary to keep the space functioning effectively, optimizing parameters like temperature, humidity, isolation of air, task lighting etc. We focused, at all times, to create an environment conducive to healing, by maximising daylight, working with a soothing colour palette, designing for barrier-free movement, and capitalising on views outside. Ease of operation for the nursing staff, ease of maintenance and sanitisation of spaces, functional inter-relationships, seamless finishes, and ergonomically designed furniture form the other key design determinants for the project.

### **Wellness for animals**

Our idea of healthcare was challenged when we were tasked with designing for a completely different and rather specific

target group- small animals. We've been working to deliver veterinary and pet care facilities for AALDA VET India Pvt. Ltd. across NCR, and have been learning at each and every step. The design process for these veterinary spaces begins with research to understand how animals respond to spaces and use that as a cue in spatial planning and concept development. The client is a Japanese concern, which presents a unique opportunity for us to bring Japanese cultural aesthetic sensibility and space planning programmatic into the design, while also making sure these ideas are translated for the Indian context of the sites.

Space planning of Japanese veterinary clinics was closely studied, stakeholders from the Indian veterinary profession were rigorously consulted, anthropometrics were studied from first principles and after several iterations, the layout was finalized. For the small animals, envisioned to be the primary user of the space, our colour palettes developed around light neutrals. Sharp geometric lines, accented by a varied material palette helped develop the rest of the interior design concept, something we also continued into the facade. The idea of ergonomics was also reformed to suit different movement needs of animals and their attendants, and different service requirements of pet care. State-of-the-art MEP systems added to the ease of operations for the facilities. A dash of playful graphics was added as the garnishing on the platter. Our interventions can be seen in their facilities across NCR.



The ICU unit and the nursing station for the Mata Chanan Devi Hospital



Reception for AALDA VET Veterinary hospital



Treatment space for AALDA VET Veterinary hospital



**Previous Page (Clockwise from Left):**

- ▶ View of AALDA VET hospital façade at dusk
- ▶ Proposed lobby for SGRC
- ▶ 3D visualisation of the SGRC façade highlighting the solar frame
- ▶ Corridor design and wayfinding strategies for Sarthak Global Resource Centre



SGRC campus under construction

**Wellness for everyone**

Taking these ideas of wellness learned from projects of varied ideologies and scales forward, we've been working with Sarthak Education Trust, a non-profit organization working to educate and skill people with disabilities, to build their Global Resource Centre in Gurugram. While accessibility has been a universal concept in our design thinking, in the case of this project, we've had to deep-dive into what makes spaces truly accessible for people with all levels of physical mobility, visual and auditory acuity, age groups, and a variety of other challenges.

Our focus has been on universal accessibility at every scale—micro or macro. We began by orienting the building wings to optimize circulation, designing classrooms to be visually and acoustically sensitive and incorporating appropriate ergonomics into every nook and corner of the building. Passive design principles have been incorporated by laying the floorplate in accordance with climatic orientation principles. The site-level treatments have been designed around making the building easy to identify, and access.

Our interior design scheme has been focused on creating optimum visual contrast between surfaces, making the space easy to navigate. Natural wayfinding through lighting design

and corridor design techniques makes the building intuitive to use. Tactile flooring has been integrated into the material palette to add to the ease of access concept. The classrooms and therapy spaces have been designed to be flexible and adaptable to multiple functions, and to the future needs of the building and its occupants.

We are also taking the opportunity that the building presents as a high visibility structure to promote sustainable and accessible design strategies such as the identity building solar frame that creates the opportunity for roof shading while offsetting our energy impact. The facade itself incorporates a media facade section to allow the building to be an information disseminator and change bringer at every level.

The approach to sensitively working on our design philosophy of promoting wellness is now going forward into our project domains other than healthcare also. Our approach is evolving into a strive for creating unique solutions to challenges posed by different projects with an underlying endeavour to optimize spaces to achieve intended function while being pleasing, soothing, and uplifting at the same time. A good example of this approach is seen through spaces designed for children.



3D visuals of GFS showing the façade scheme



3D visuals of GFS showing the façade scheme

### **Holistic wellness for children**

After being commissioned for the expansion and renovation of Green Fields School (GFS), we have been collaborating with the school's decision makers to develop a vision of delivering quality education in a state-of-the-art facility which provides a variety of spatial experiences. With the school being Anuj's alma mater, we have an inside perspective that helps us start informing the design brief.

Creating a design which revolves around the students and caters to their needs and habits, we are focused on creating spaces for learning, tinkering and growing. Not limiting the design thinking to academics, but holistic development of the young minds was the driver behind designing built as well as unbuilt spaces. With these ideas in mind, we are planning the expansion in a way that the building works as a learning aid to students. With flexibility in classroom layouts

to the provision of open-air classrooms, we are creating a variety of spaces that would make school a more inviting and comfortable space for budding minds.

Our intervention seeks to make the building more passively resilient, with the integration of facade design strategies that promote natural cooling and ventilation, while also creating a built form that integrates easily at the human scale. We created opportunities that allow students to take ownership of their space, by including them in the final look of the building by means of facade panes meant to host student work and be modified through the year to represent different school activities.

The expansion is to be planned in an existing functional facility. Project scheduling around the academic calendar, making sure the construction zone is adequately secured and minimising interference in the existing functioning have all been drivers in developing the project schematics.

The wheel of philosophical evolution completed a turn when we were developing interiors for a 3-BHK apartment and were challenged by a 5-year-old playful kid in the design of his bedroom. Ankur, with his strong background in residences, took the lead with this project. Designing this bedroom became fresh learning for us in terms of ergonomics, child-friendly environments, colour palettes, visual balance, balancing play and function, flexibility and adaptability, access to daylight and views and a variety of other construction-related issues. The result was a space which complements the colourful world of a child, yet is sensitive to the functionalities of a young human growing up.



Playful, graphic bedroom designed for a 5 year old



Playful, graphic bedroom designed for a 5 year old

All images courtesy: **Arris Atelier**

### Planning the road ahead

The first steps of our journey have been memorable, and at the same time eye-opening. With the vast body of knowledge and the evolution of thought that lies beyond, we at Arris look at the design process as a means of spreading happiness, wellness, and good memories in spaces that we build and enhance. While the path to be tread is full of surprises, following the directions laid out in ancient wisdom rooted in science, creating synergy with nature, adapting to the challenges of modern life, and creating happy and healthy spaces for all are the four wheels which we envisage to drive our wagon ahead into giving back to the society as well as the beautiful profession that is architecture.



**Ar. Ankur Yadav** has experience working with real estate developers and retail organisations. He has a keen eye for detail and is passionate about furniture design. His design is about unravelling different modernities and trying to acknowledge how we live in the world presently.



**Ar. Anuj Khandelwal** has experience of working with boutique firms and training young architects at the Sushant School of Art and Architecture. He believes in user-centric space design where needs and habits of the user drive the design, and his consistent involvement at site during the projects ensures the qualitative strength of our work.



**Ar. Artika Aggarwal** is also an urban designer and has made her work and research revolve around the idea of placemaking and making more with less. She has an interest in human-centric design and investigating how people move through space. She also is a visiting faculty at SPA, New Delhi.



**Ar. Varun Seth**, also a project manager, believes in creating spaces that are simple and calm. Varun creates high performing spaces around human interaction, nature and system and achieving desired function with maximum efficiency. He has worked with developers, boutique firms, research and is also a visiting faculty at SPA, New Delhi

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# EVOLVING JIIA AS A JOURNAL WITH IDEAS FOR DEVELOPING ARCHITECTURE APPROPRIATE FOR INDIA

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Ar. Akhtar Chauhan

I have been active in the Indian Institute of Architects (IIA) since 1984, when I made a presentation in the first technical session of the IIA National Convention held at the Taj Mahal Hotel, Mumbai. I had come to know about the IIA convention only a few days ago. I decided to write a technical paper on the *Role of Architecture in Urban and Rural Growth. Designing for Architecture with a Development Perspective*. I had to work overnight to finish the paper and then I rushed to the convention venue just in time. I was happy to meet Prof. Balkrishna Doshi, who was the Chair of the first technical session. When I told Prof. Doshi that I had a paper to present, he was surprised. As it happened, a listed speaker was absent and I got the chance to present my thoughts! I read the paper which focused on several critical issues. The paper attempted to shape a framework for architects' role in the coming decades in India with a developmental perspective. I began with the introduction: "Today, we are proud to be the third largest technical power in the world in terms of human resources. However, we have yet to overcome

the problems of backwardness, poverty, unemployment and inequality. An architect in his multiple roles as a master craftsman, artist, builder, scientist, technologist, writer, communicator, designer, coordinator, manager and not in the least as an active citizen in the democratic process, has very important and significant roles to play in shaping the environment as an agent of change in urban and rural areas, through designing, planning and managing, in the process of growth and development." I then presented a detailed action plan for the architects, as a synthesis, as follows:

### **Synthesis: Challenges and Responsibilities**

Identification of roles shall have to be taken up at personal, group and institutional levels with specific goals and objectives based on the awareness of the issues and problems involved in the process of development.

The tasks were grouped under various stages of the development process as:

- A) Identifying the issues and people, setting up the relevant goals and objectives for development action.
- B) Research and studies in the developmental process in the context of change in environmental scenarios, mapping of resources and framing methodology for planning, designing and managing the process.
- C) Restructuring and extension of institutional infrastructure.
- D) Effecting changes in legal framework and instruments for effective policies and programme implementation.
- E) Application of findings and conclusions in practice, field testing, monitoring, evaluation and feedback for further improvement.

#### **A. Identifying the issues and people: Setting up goals and objectives**

1. With the progress of the scientific and technological revolution, it is now possible and inevitable that architecture no longer remains a sophisticated art for the privileged elite, but becomes the art and science of shaping the environment for the entire people. No longer are our 'clients' a few aristocrats but the entire 'folk' with their culture, traditions and communities are!
2. In the Indian context our 'target' groups shall include the tribes, landless labourers, backward classes, economically weaker sections, farmers, artisans, pavement dwellers, slum dwellers, chawl dwellers, middle-class houses and apartment residents in addition to the existing clients. That makes a total of 1000 million by 2000 CE for 1500 architects!
3. Reformulation of housing goals and objectives for the plans at the centre, state and district levels to address the total housing demand in a 15-year perspective plan.
4. The priority for socially backward and economically weaker sections, backward regions and areas in planning and actual implementation.
5. Active participation of people in making plans, designs and programmes. Their effective involvement in implementation through an innovative process of management. The rich heritage of the freedom movement needs to be carried forward for a movement for social and economic independence.

#### **B. Research and studies in the development process**

1. The unprecedented challenge of development poses the question of in-depth knowledge and studies. This is not to deny the work of pioneering visionaries and institutions, but to stress the need for a creative approach to the problems of research and studies as a pre-requisite for planning and designing. Their scope should include the study of climate, local materials, traditions, culture and behavioural patterns of people and communities at various levels.
2. Setting up of cells, centres and institutes of research in rural, urban and regional development. Incorporating environmental studies and projects into the syllabus of primary and secondary schools. Setting up of special centres of studies and research in environmental fields, such as a network of Indian Institute of Architecture, Design and Planning (IIADP).
3. The education and training of students, workers, supervisors and contractors through a network of polytechnics at various levels.
4. Organising students and youth in the tasks of

development and environment, by forming a Special Corps and/or integrating existing voluntary corps like NCC and NSS.

5. Extensive and intensive use of various communication media for spreading the message of development, including the results of the latest research, study, programmes and projects.

#### **C. Applications, Monitoring and Evaluation**

1. Applying the studies and research in practice. Making the choice of socio-technical systems a specific issue.
2. Field testing of new models, patterns, designs and programmes.
3. Updating the systems of monitoring and evaluation to guide and control development; setting up mechanisms for better quality control and efficient implementation.
4. Encouraging and inviting feedback from people, that is, actual users, workers, supervisors, officers, designers, planners and managers for further improvement and proper maintenance.
5. Production and distribution of socio-technical literature, concerning research, studies and applications, in the form of posters, wallpapers, newspapers, magazines and journals.
6. Priority for low-cost, appropriate and socially relevant architecture.
7. Provision of social and cultural infrastructure such as facilities for health care, learning, welfare and development for the communities.

#### **D. Restructuring and Extension of Institutional Infrastructure**

1. Restructuring of existing infrastructure such as technical and vocational training schools. Architecture and planning colleges and professional bodies like the Indian Institute of Architects, etc.
2. Extension of institutional infrastructure for development, including organisations such as Housing and Urban Development Corporation of India (HUDCO), urban development authorities, development banks, Housing and Development Finance Corporation Ltd. (HDFC), etc.
3. Enlarging the network of legal-aid centres with facilities for coordinated management of statutory approvals.
4. Establishment of a new network of Vikas Kendra, that is, a Centre for Development at local levels to guide and assist in development projects.
5. Formulation of action programmes to develop these institutions from local and community levels to the state and national levels, provision of adequate resources, equipment and facilities for them. Integration and interaction among the institutions for development programmes. Formulation of inter-disciplinary and inter-institutional programmes in education, research and applications.

#### **E. Changes in Legal and Planning Instruments**

1. Restructuring education, science and technology policies and programmes to generate a new thrust for development.
2. To make people aware of their rights and duties; to mobilise them for effective participation and direct involvement in the programmes for development.
3. To restructure the administrative system to make it efficient and socially relevant. Further development of multi-level planning process by strengthening planning and design organisations at various levels, particularly at district and taluka levels.

4. To reform existing laws and to enact new relevant laws to make them effective instruments of social change.
5. To make national planning and budgeting more relevant to people's goals and objectives. To give higher priority to housing, human settlements, environmental and development programmes, and to provide adequate financial resources for the same.
6. To enlarge the scope of fundamental rights to include the Right to Work and Shelter.

To carry out the above-mentioned programmes in areas related to the role of architects in the process of development, we shall have to adopt a time-bound programme for ourselves as a professional institution and in personal fields as individuals. It is high time that we all take initiative to give a new momentum of our own.

### **Need for an Action Programme**

We have a Himalayan challenge before us to meet the needs of our people and the aspirations of our nation. Are we prepared? Are our institutions adequately organized to meet the challenge? Does the Indian Institute of Architects have a plan of action to contribute its own share of responsibility? Do we as architects have any role to play in this gigantic responsibility? Architects as creative and constructive individuals as well as a professional community have to take up the challenges and responsibilities of shaping the quality of life in human settlements and the structuring of the living environment in the Man-Architecture-Environment system.

*Finally, it is a question of individuals' choice of a way of life. As architects in India, we have the unique opportunity of playing a meaningful role in the shaping of the environment. If we want to avoid the problems of unbalanced industrialization and urbanization such as pollution, concentration and alienation, if we want to live in a spirit of joy and happiness, there is no better way than to play the role of a creative participant in the process of development, as individuals, groups and a professional community.*

*The architecture of new India shall then express our culture, creativity and commitment more distinctly.*

AKHTAR CHAUHAN (1984)

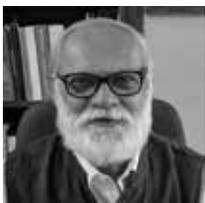
IIA NATIONAL CONVENTION, BOMBAY.

Many decades have passed since then. Yet, these ideas are as relevant as then. We can surely debate, discuss and refine the

action programme to create a more humane, sustainable and democratic republic!

I did not expect that I would be drawn into the activities of the Indian Institute of Architects so suddenly and completely! It was a pleasant surprise when I was made a member of the Professional Services Board and then the IIA Board of Education. Soon I was made the Hon. Editor of the Journal of the Indian Institute of Architects (JIIA). It had a budget of Rs. 10,000 per issue and a very unfriendly agreement with the publisher where they had complete control of the Journal. It took us a couple of years to overcome the difficulties. Thanks to the members of the Editorial Board and the IIA Council we succeeded in getting control of the Journal through negotiations and finally getting a new printer. In the process, I had to travel every day to IIA Head Office from Malad, six days a week for all the seven years I was the Hon. Editor, JIIA!

As I was made an ex-officio member of the IIA Council, I got the opportunity to give ideas and suggestions for improvement and transformation of the Journal of the IIA. I proposed the institution of the annual JIIA Project Awards. There was some opposition as we did not have adequate financial resources then. We proposed a small budget of Rs. 15,000 per annum! The office bearers wanted us to show corpus funds for the same. I lost my cool and asked them if they have a corpus fund for administrative expenses to the tune of lakhs of rupees! Finally, Hon. Treasurer Prof. Datta Malik donated Rs.10,000/- towards the awards budget and we got the final approval thanks to President Rusi Khambatta, Vice President Madhav Deobhakta, Jt. Hon. Sec. Shireesh Deshpande and Arun Ogale. We constituted JIIA Project Awards in six categories including Residential, Commercial, Institutional, Public, Interiors, Unbuilt projects and Research projects. We invited the entries and appointed a panel of jurors. We hosted the first JIIA Awards function at the Sea Rock Hotel, Bombay! It was a great success!!! Year after year JIIA Awards became known throughout India. Young architects, senior architects and Great Masters all participated in the process to make it a prestigious awards programme! I am so happy and thrilled that it has evolved over the years with greater participation and diversity!!!! My heartiest congratulations to Team JIIA !!!



**Ar. Akhtar Chauhan, F.I.I.A.** is an architect, planner and educator based in Mumbai. He was the Hon. Editor of JIIA; Chairman of IIA Publication Board; Secretary, IIA Professional Services Board; Member, IIA Board of Education; Secretary, IIA International Affairs Board; Jt. Hon. Secretary, IIA National Council (1990-92) and an Elected Council Member of the Council of Architecture (1989-93).  
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# SETTING UP HEALTHCARE INFRASTRUCTURE

Prof. Dr. Anil Dewan & Ar. Sandal Kapoor

The setting up of healthcare facilities is a complex task and require a good understanding of the need of all stakeholders. Various factors can affect the planning and design such as demand, budget, site, type of facility mix, technical feasibility, economic viability, etc. The location of the site determines the approach to the facility and the floor area availability. Demographic survey data and socio-economic profile of the region have to be analysed to understand the health profile of the region, thereby working out the demand and type of facility mix required, and of what speciality discipline is required, whether the area can absorb more single rooms, suite rooms or we should have more general ward beds, etc.

To start the design process, we must work out the tentative budget for planning and designing, building construction, equipment budget, operation and maintenance budget.

The total built-up area per bed can be worked out (750 - 1250 sft) and the tentative cost of construction comes out to be INR 3500 – 4500 per sft of the built-up area, depending on the interior finishes.

## UNDERSTANDING HOSPITAL DESIGN

Hospital components can be grouped based on functions:

- Group-1: Outpatient Department
- Group-2: Emergency Department
- Group-3: Diagnostics
- Group-4: Treatment Unit including Critical care areas
- Group-5: Nursing Unit
- Group-6: Support Functions

It is important to understand the relationship matrix of various departments. The floor-wise distribution and connectivity between departments are to be worked out by

creating a 'stack diagram' of the hospital, which shows the distribution of facilities on various floors.

The out-patient department (OPD), which mainly works during the day, needs to be properly vertically zoned (stacking one above the other) so as to not affect the functioning of other departments.

The emergency department needs to work 24x7. Therefore, it should have its own entry/exit and the diagnosis department should be near the emergency department as well as the OPD and in-patient department (IPD).

The operation theatre (OT) complex should have direct connectivity to the emergency department as well as to the ICU, ICCU and other speciality departments.

The in-patient department zone needs to be segregated from the heavy traffic zone (OPD, emergency etc) and should preferably have a separate entry/exit.

The CSSD needs to be planned vertically below the OTs; services like laundry and the dietary department should be directly connected to the IPD.

These were the various functional requirements of hospitals. The following architectural aspects also need to be considered while designing:

## FUNCTIONAL ZONING:

*Separate all departments yet keep them close to each other; separate types of traffic yet save steps to everybody. That is all there is to hospital planning.*

EMERSON GOBLE.

The basic principle on which the zoning of hospitals is based is segregation of traffic or controlled movement.

Patients, staff, visitors and materials should be able to move throughout the hospital in accordance with certain criteria that require segregation of soiled traffic from clean traffic.

Another basic principle is functional proximities and relationships between various departments which, in turn, relate to patient and staff movements.

#### **EVIDENCE BASED DESIGN:**

In simple words, it is the concept of basing design decisions on the best knowledge available. It is an approach to assist designers to make decisions based on available knowledge about the impact of those solutions upon people, cost and management. Evidence may challenge old standards and promote innovation. Also, the approach can stimulate learning by creating a routine of collecting evidence to investigate whether the right decisions were made and expected results were achieved. However, more collaboration between researchers and policy-makers is needed to understand better the contribution of evidence-based design for practice.

#### **FLEXIBILITY AND EXPANDABILITY / SPATIAL PLANNING:**

Because the only certainty in health care is change. Gressel & Hilands, 2008.

With rapidly changing needs and advancing technology, the design of the building should allow for future expansion, which can be achieved by the modular approach.

Flexibility should be considered at the micro-level (adjustability within departments) as well as the macro-level (expandability in the context of the entire hospital).

#### **HOLISTIC AND COMPREHENSIVE APPROACH:**

The architectural design of hospitals is totally centred on their complex functional requirements. These include diagnostics and treatment, emergency treatment and surgery, hospitality functions, such as food service and housekeeping and fundamental inpatient care or bed-related functions. Every department should receive its due consideration as a whole.

#### **HEALING CHARACTER:**

Both architects and designers, like it or not, must always care for the 'psychological implications' of their design decisions. David Canter, 1972

Hospital architecture must contribute positively to the healing process. It must have a humanizing character, that is, a designed environment and spatial distribution in which the needs of the patient (sense of acceptance, respect for privacy, space and sensory comfort, ease of orientation) are fulfilled and stress is actively destroyed.

Certain factors can enhance the healing character of the building – including the distribution and composition of space, building typology, visual connect to the external environment, prayer spaces, materials, finishes and colours used, and elements of visual reference (art, installations etc.).

#### **INFECTION CONTROL IN HOSPITALS:**

The sickness factor of a hospital, generated due to the spreading of infection within the hospital, needs to be dealt with. Sterile zones (ICU, acute care wards, OT, delivery rooms, isolation wards) need to be segregated from the general traffic. Air changes including fresh air allowance should be ensured as per recommended norms.

#### **PATH FINDING IN HOSPITALS:**

Hospitals are known to have a large flow of visitors. Thus, it is necessary to have controlled movement throughout the campus. Proper signages should be used for directional, instructional, promotional or informative purposes. The use of illuminated as well as non-illuminated signages need to be considered. Directional guides also add to the patient-friendly environment of the hospital.

#### **VALUE-ADDED SERVICES:**

Those services offered in a hospital which add value to the hospital experience or offer additional benefits which culminate in a wholesome and satisfying experience for the patients and their attendants and other visitors are called value-added services (VAS). These services provide an enriching experience to patients and help retain existing clientele. Besides providing additional revenue, VAS increase the overall value proposition for the hospital visitor to make it more attractive to him as a customer. A few examples of VAS could be ATM/banking services, florists, gift shops, book shops, fruit shops, postal /courier services, communication facilities, cyber cafés, multi-level parking and round-the-clock pharmacies.

#### **SUSTAINABLE DEVELOPMENT:**

Sustainable development can be described as an approach that meets the needs of the present without compromising the ability of future generations to meet their own needs. A few aspects to be considered are:

- *S.W.O.T Analysis:* The need to identify strengths, weaknesses, opportunities and threats related to the site in order to come up with the best possible solution.
- *Conserving Existing Ecology:* In order to reduce the ecological footprint of the building
- *Passive Solar Design:* Building orientation and volumetrics to facilitate mutual shading helps in reducing the mechanical load of the building.
- *Wind Direction:* It can be channelled effectively for better ventilation and improved air quality.
- *Rain Water Harvesting:* It helps to replenish the groundwater table, thereby minimising the environmental impact of the building.
- *Soft and Hard Paving:* Reducing hard paved areas not only helps in the prevention of heat islands but also increases soft paved areas, thereby helping in recharging groundwater.
- *Use of Renewable Sources of Energy:* Alternate sources of energy should be focussed upon.
- *Maximizing the Use of Locally Available Materials:* In order to minimise the environmental impact and also helps in reducing overall project cost.
- *Building Envelope:* Better insulation not only reduces mechanical loading of the building but also improves indoor air quality.
- *Waste Management:* The STP and WTP should be planned in order to achieve zero discharge.

Apart from the above-mentioned aspects, it is important to analyse every design decision from the viewpoint of every stakeholder. It is thus, important, to consider factors regarding functioning and continuous quality improvement of the building, at the design stage.

### ACCREDITATION PROCESS:

Accreditation is a process in which an entity, separate and distinct from the health care organisation, assesses the health care organisation to determine if it meets a set of requirements designed to improve the quality of care. Accreditation is beneficial for the health care organisation as well as the users, usually patients and their attendants. It helps to improve the quality of care provided and also ensures users get optimum health care services.

National Accreditation Board for Hospitals (NABH) standard outline can be classified as:

#### a) Patient Centred Standards:

- Access, Assessment & Continuity of care (AAC)
- Care of Patients (COP)
- Management of Medication (MOM)
- Patient Right and Education (PRE)
- Hospital Infection Control (HIC)

#### b) Organisation Centred Standards:

- Continuous Quality Improvement (CQI)
- Responsibility of Management (ROM)
- Facility Management and Safety (FMS)
- Human Resource Management (HRM)
- Information Management System (IMS)

All of the above mentioned standards should be taken into account while taking design decisions in order to come up with better patient-friendly, evidence-based design.

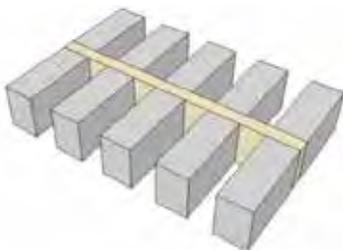
### BUILDING TYPOLOGIES:

Health care facilities have evolved through the ages, and so have their design and building typologies:

#### 1) Linked Pavilion or Finger Plan

This is the oldest typology and is still commonly used. The pavilions would often have clinical spaces on lower levels with wards above. This typology enhances flexibility and segregation of traffic. However, a large area is needed for circulation.

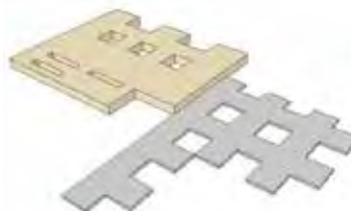
Example: Woolwich Hospital and St Thomas's Hospital, London.



#### 2) Low-Rise Multi- Courtyard or Checkerboard

This typology can offer a human scale in contrast to the institutional character that tends to overwhelm most hospital designs. This typology also enhances flexibility and segregation of traffic. However, it tends to apply to larger, non-urban sites.

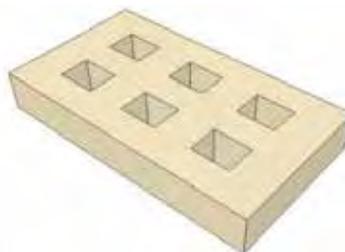
Example: Wexham Park Hospital; Venice Hospital (unrealized design by Le Corbusier); Homerton Hospital, London.



#### 3) Monoblock

Small atria/ light wells can take many forms and the lower floors may have fewer, with deep planning for non-patient areas. Circulation is efficient in this typology but the need for artificial lighting increases.

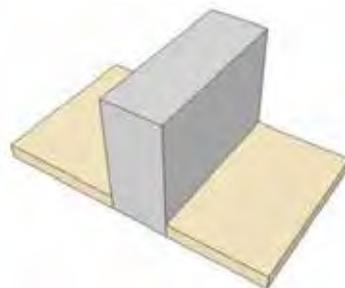
Example: Greenwich Hospital, London (demolished); Boston City Hospital; McMaster University Hospital, Ontario.



#### 4) Podium and Tower

The wards are generally in the tower with clinical and technical areas on the slab. This typology is effective in urban sites. However, upper floors might have problems regarding travelling distance.

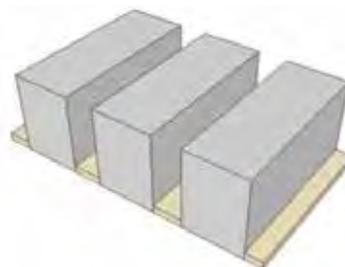
Example: Bridgeport Hospital, Connecticut; Prince of Wales Hospital, Sydney; Royal Free Hospital, London.



#### 5) Podium with Two or More Towers

Similar to above mentioned typology, here too the wards are generally in the tower with clinical and technical areas on the slab.

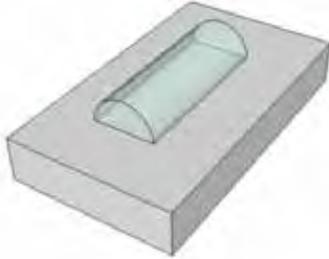
Example: Queen Elizabeth Birmingham Hospital, England.



### 6) Atrium / Galleria

The clinical and technical areas are generally in the lower levels with wards on the upper levels. Day light can penetrate working floors from both sides but the cellular character of the hospital building makes this a less obvious solution.

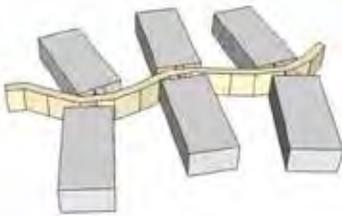
Example: New Children's Hospital, Sydney; Chelsea and Westminster Hospital, London; Hospital for Sick Children, Toronto.



### 7) Street

The pavilions often have clinical spaces on lower levels with wards above. This typology enhances flexibility and segregation of traffic as well as the legibility that the street itself offers to patients. However, a large area is needed for circulation.

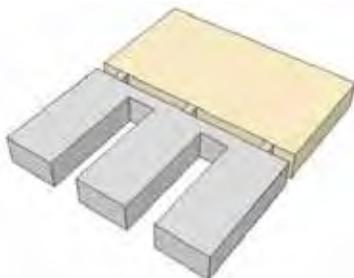
Example: Wythenshawe Hospital, Manchester; Northwick Park Hospital, London; Westmead Hospital, Sydney.



### 8) Unbundled

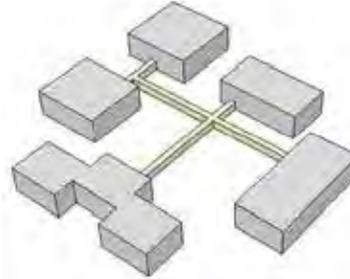
This shows a pattern of segregation of the diagnostics and treatment functions on the one hand, and on the other, the nursing functions along a shared circulation. Circulation is efficient in this typology but the need for artificial lighting increases.

Example: Norfolk and Norwich Hospital, Norwich, U.K.



### 9) Campus

Individual buildings are located around the site with or without an enclosed circulation network. This typology enhances flexibility and segregation of traffic. However, a large area is needed for circulation. The organic development of the campus over the years leads to this typology.



### CONCLUSION:

The architecture of healthcare facilities must facilitate the adoption of new technologies besides contributing to the efficiency and transparency of processes. It must provide seamless integration of clinical requirements with building planning and designing issues. The built-to-open relationship of the buildings must depict the inclination toward nature thereby, creating a friendly and healthy environment.

### Bibliography & references:

1. Gupta, Shakti K.; Chandrasekhar, R. (2007). *Modern Trends in Planning and Designing of Hospitals*.
2. Prasad, Sunand. (2008). *Changing Hospital Architecture*.
3. Canter, David. (1972). Royal Hospital for Sick Children: A Psychological Analysis. *The Architects' Journal*.
4. Gressel, Steve; Hiland, Kelly. (2008). *New Hospital Designs Focus on Reducing Cost, Improving Health and Flexibility*.
5. *Journal of Health Services and Policy*, Sage Publications. Retrieved from: [hsr.sagepub.com](http://hsr.sagepub.com)
6. *NABH Standards*, Quality Council of India



**Prof. Dr. Anil Dewan** is the Head of Department, Architecture at School of Planning and Architecture, New Delhi. Expert in Healthcare Planning and Designing with Doctorate in the topic- **Methodology for preparation of standards/ guidelines for the design of new hospitals in India** Beside teaching experience of more than 30 years, he is also involved as advisory expert to many institutions and organizations including World Bank, BIS, for setting up standards/ Norms for planning and designing of healthcare infrastructure.

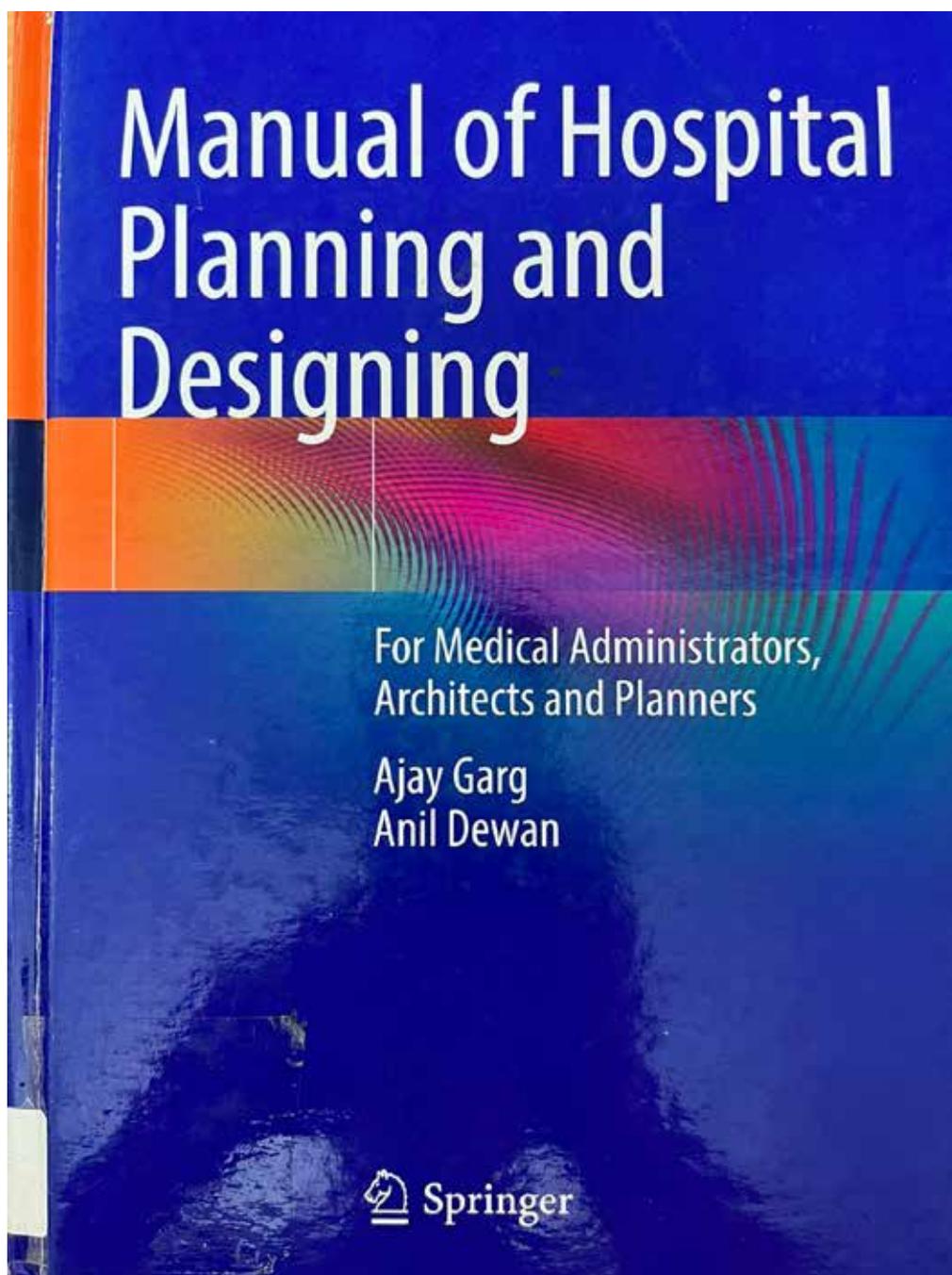
Also, co-authored a book titled- "**Manual of Hospital Planning and Designing**" published by Springer.  
[a.dewan@spa.ac.in](mailto:a.dewan@spa.ac.in)



**Ar. Sandal Kapoor** Graduated from School of Planning and Architecture, New Delhi. Having experience of more than 10 years in planning and designing Healthcare Facilities. Running Architectural practice namely **Sandal Kapoor Associates** in Delhi. His selected works includes many hospitals such as, Kriti Renova Cancer Hospital at Prayagraj UP, Oncocare Cancer Hospital at Moradabad, Shanti Vilas Hospital at Prayagraj, Kailash Omega Oncology Centre at Dehradun, RHL Renova Oncology Centre at Jaipur, Medical Specialty and Diagnostic Centre at Kathmandu, Nepal.

# HOSPITAL DESIGN MADE EASY

Ajay Garg, Prof. Dr. Anil Dewan



**Fact File**

Title: Manual of Hospital Planning and Designing  
 Authors: Ajay Garg, Anil Dewan  
 Publishers: Springer Nature Singapore Pie Ltd  
 Cover: Hard Bound  
 Pages: 532

*“The very first requirement in a hospital is that it should do the sick no harm”*

- FLORENCE NIGHTINGALE

There is no denying the fact that in the recent decades, the healthcare segment in the Indian context has been addressed, both by the government and the private sector, with the aim to improve the quality of hospital planning with a professional and analytical approach. Efforts are on to gradually fade away hospitals/health-care facilities with a drab architecture and interiors that are antiseptic in appearance and planning that is rather disoriented to the functionality. Infrastructure has never been given that due priority. A lot more is desired. To give a further impetus and strength to this very important and earlier neglected typology in planning, experts and professionals in this field Ajay Garg and architect Dr Anil Dewan have recently documented with meticulous detail, the “Manual of Hospital Planning and Designing” – a ready reference book that is a humungous wealth of knowledge about all that gets encapsulated in the conceiving and making of a hospital - planning and designing/construction/clinical/operational requirements/departments and their roles/required equipment/administrative and managerial controls/fire safety – you name it and there would be information here with specifics. This manual is no doubt going to be very informative for not only the students/researchers, but also the practising architects, hospital developers and managements, doctors, allied professionals and even the layman interested in the design process.

We often lament that there are very few professionally dealt and purposefully written books on design/planning/architecture that have been authored by Indians. It is very heartening to observe that after a long time-span, this very comprehensively outlined book of international standards is now available in India for reference – and yes, authored by Indian minds. As it is, there are very few books put together on this subject. This manual fills the void of reference literature in this field. The intricacies in the design and operations of small/large scaled healthcare facilities have been very deftly explained in a simple and straight forward language.

The authors explain their motivation to pen down this impressive compilation to be the sad state of affairs in hospitals in the country because of design ignorance and indifference to detail. Backed by a robust experience in hospital administration and design, the authors further state, “The book has been written to pursue design and planning methodologies to build smart hospitals that would act as models for the future. A well planned and designed hospital contributes a lot to reduce errors, enhances the patient satisfaction experience and increases staff efficiency. Our goals will be achieved if this manual inspires the hospital owners and managements to build healthcare facilities that

have the modern-day desired levels of functionality/smooth circulation/pleasant environs.”

Many a times one comes across in the market, manuals that tend to meander away from the subject. But not this one. From the beginning to the end, the focus is retained in the well-illustrated content to provide the reader the hidden secrets towards a hospital design that is utilitarian, effective and practical. The text dwells on the nuances of the subject without delving into distracting architectural forays. It should definitely provide all that is required to bring true Thomas Frist’s quote, “Take care of the patient and everything else will follow.” Heartening it is to see separate chapters on Green hospitals and inputs required to make them sustainable.

The Singapore based publishers Springer have taken that one step extra to make this well refined hard-bound documentation a must for all libraries and for one and all associated to the healthcare sector – whether a hospital consultant, government expert, medical practitioner or an administrator/developer. A well curated resource book it is.

*Architect/editor/academician Suneet Paul with over forty years of experience in the profession, is the former Editor-in-Chief of Architecture+Design*



**Ajay Garg** has been in the field of health care planning, designing and administration from last three decade. He has worked for about 28 years with various hospitals like Narinder Mohan Hospital & Heart Centre, Ghaziabad; Jeevan Rekha Hospital, Kashipur; Teerthanker Mahaveer Medical College, Moradabad etc. He has also completed various hospital projects like Krishna Hospital (Kashipur), Narayan Hospital (Rudrapur), Le-Crest Hospital (Vasundra, Ghaziabad), TSM Medical College & Hospital (Lucknow) as a hospital consultant.  
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**Prof. Dr. Anil Dewan** is the Head of Department, Architecture at School of Planning and Architecture, New Delhi. Expert in Healthcare Planning and Designing with Doctorate in the topic-**Methodology for preparation of standards/guidelines for the design of new hospitals in India** Beside teaching experience of more than 30 years, he is also involved as advisory expert to many institutions and organizations including World Bank, BIS, for setting up standards/Norms for planning and designing of healthcare infrastructure.

Also, co-authored a book titled- **“Manual of Hospital Planning and Designing”** published by Springer.  
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# DOHNAVUR FELLOWSHIP, DOHNAVUR, TAMILNADU.

(ESTABLISHED IN 1901)

**Ar. Vaishnavi**

The Campus of Dohnavur is of English Gothic style. The Buildings in the Campus is enveloped in Travancore Style (walls and Roofs) with traces of Japanese elements,(edge detailing).The detailing of the architectural features are in combination of wood ,metal and bricks.



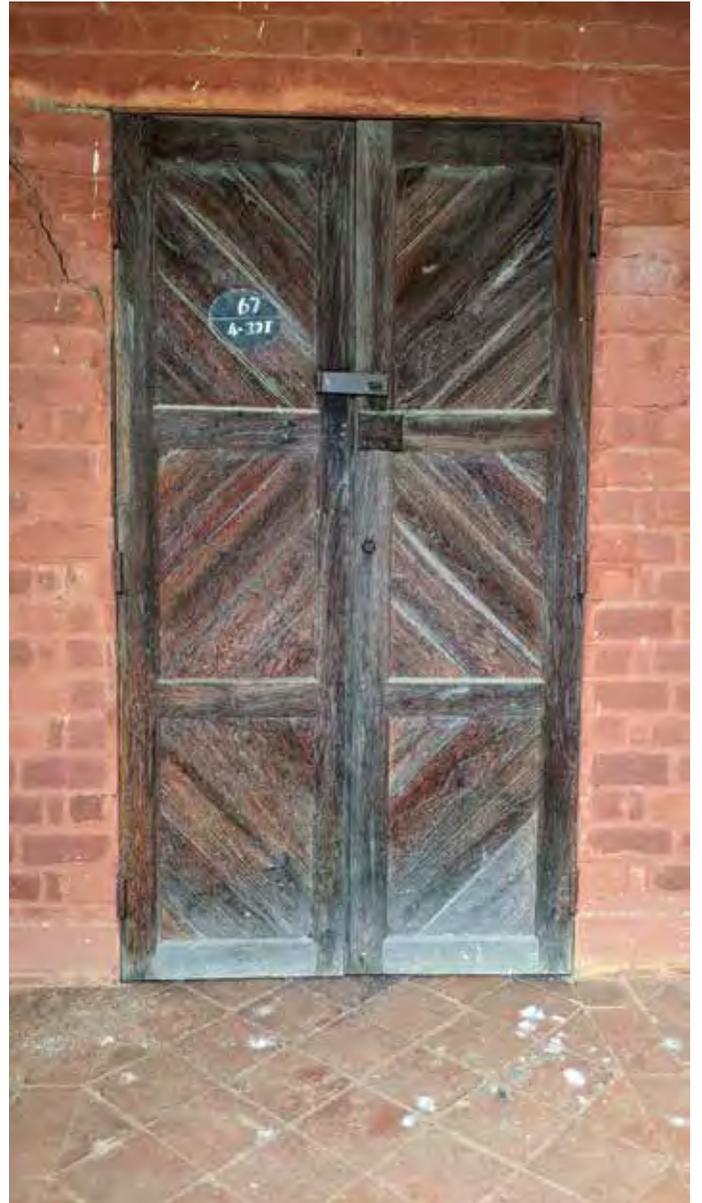
Chape Front



Chapel Side



CLOCK TOWER



DOOR DETAIL



CLEAR STOREY



ENTRANCE GATEWAY



HANDRAIL DETAIL



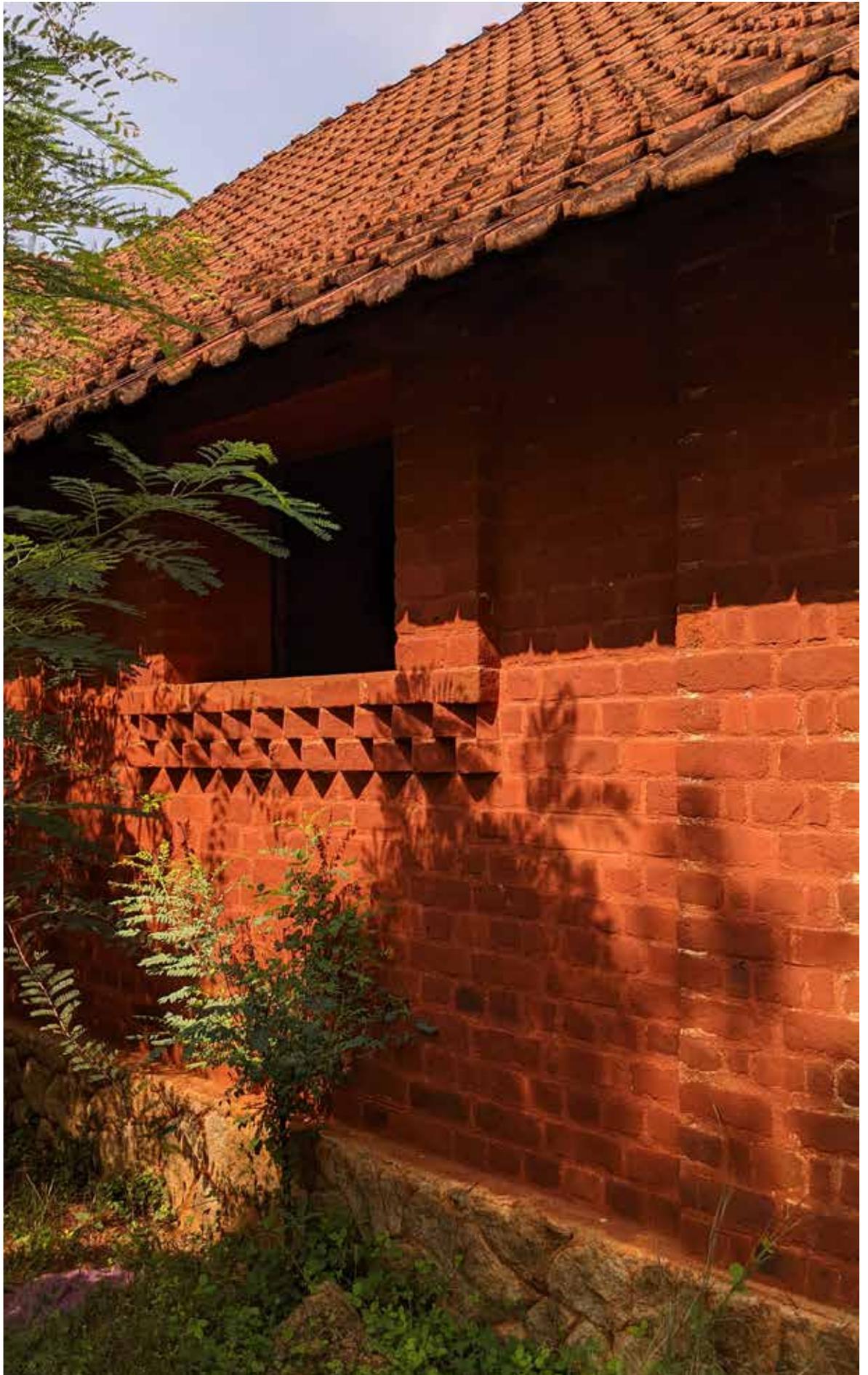
ENTRANCE



JALLI DETAIL



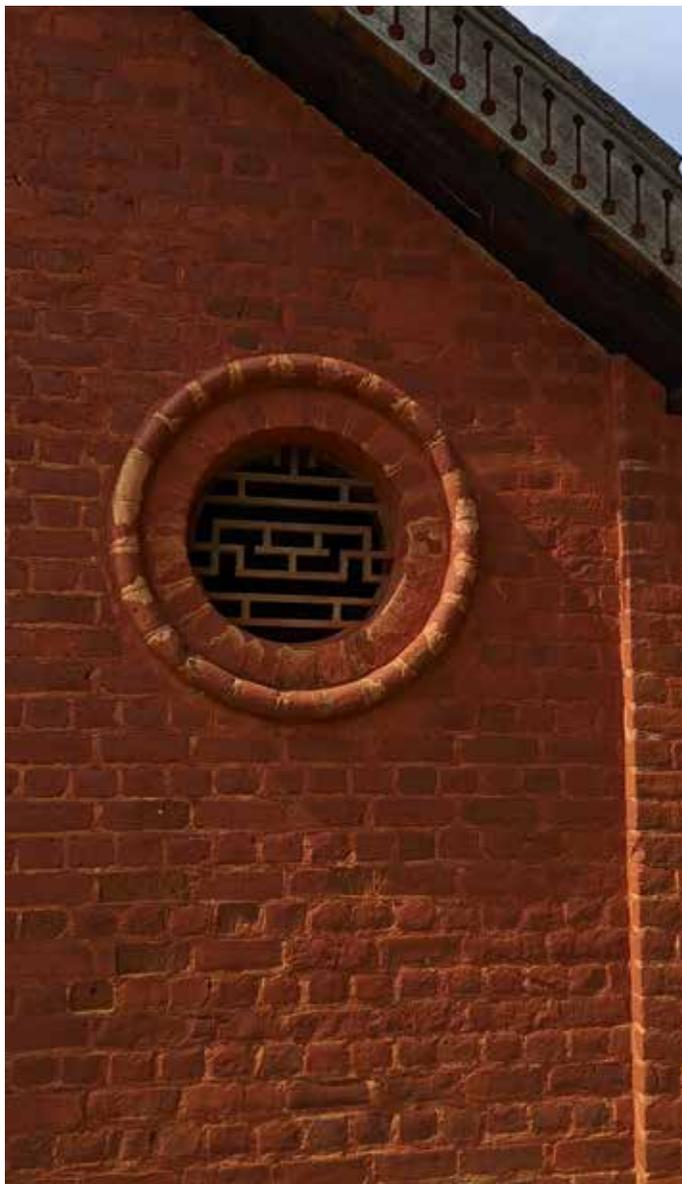
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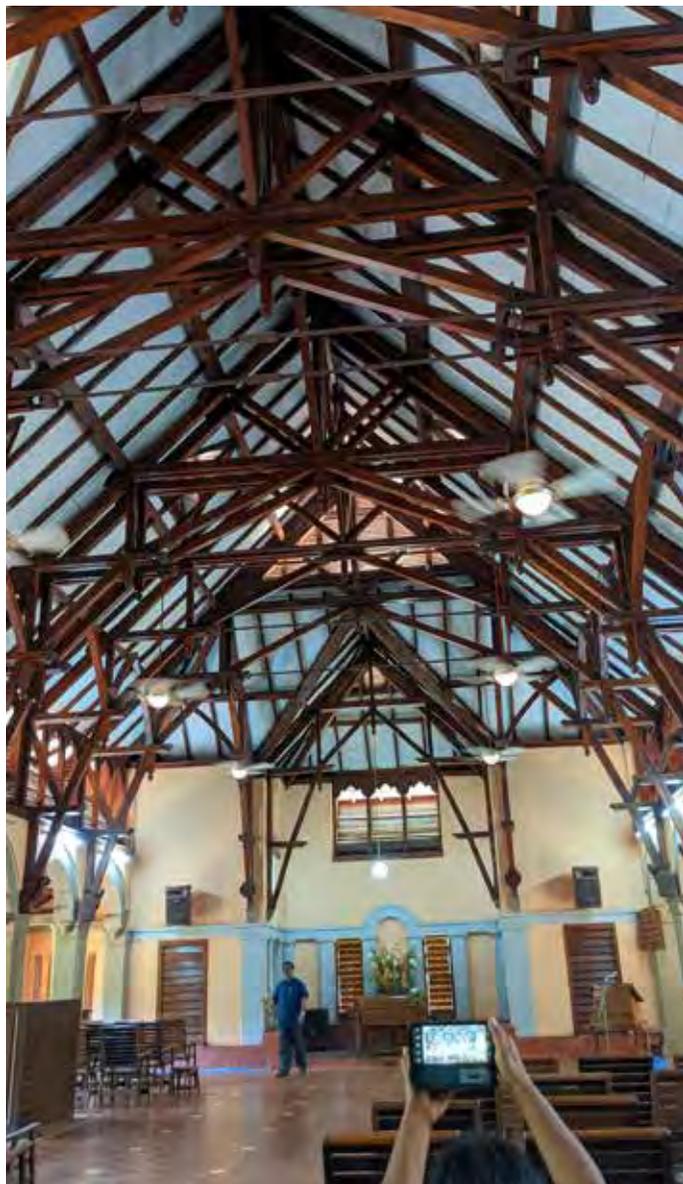
JALLI DETAIL



OPENING DETAILS



OPENING



WOODEN STRUCTURAL SYSTEM



**Ar. Vaishnavi** is a graduate from University of Madras. She is a Co-founder of Transform architects, Thrissur, Kerala. She has been working in the field of Architecture, Interiors and landscape design since 2002. Her Passion towards travel and learning Architecture made her visit places. She believes that Architecture, interiors and landscape should respond to each other. [mailtransform@gmail.com](mailto:mailtransform@gmail.com)

# DAULATABAD FORT

Ar. Rajkumar Vaswani

A peek into the past is like a pause. It makes you think deeply to uplift hidden and suppressed emotions. Such pauses, fueled with learnings, help us discover our own abilities and to strengthen our visions.

One such short sketching journey of the majestic Daulatabad Fort unwinds the mannerisms of the spaces structured along with the built form for various emotions and feelings experienced by changing scales, volumes and spatial configurations.

Daulatabad Fort was built with the prime objective of safeguarding the people living in the fort. This fort, reminiscent of power and valour, was actually conceived as a big hideout with very close-knit spaces and squeezed volumes, sudden turns, deep black holes and puzzling meandering paths all knitted together by a meandering path along the contours of the land connecting the public and private squares.

The majestic black stoned fort punctured with jharokhas, small-sized windows peeking into the jungles, series of arched doorways framing the views, lead one from one emotion to another with the changes in scale and perspective.

The natural element stone is in focus in exquisite details.



A masjid, public hall, the tall minar is visualised as an emotion buster with its red stone construction and ornamented architectural detailing soars high into the sky like our contemporary iconic structures. Whilst passing through the minar one experiences podiums on which this grand vertical element sits. Functionally these podiums act as storehouses for weapons and artillery. A very interesting way of connecting functions with emotions and a grand statement. Moving on this path filled with twists and turns we approach yet another set of doorways from where the private spaces for the rulers begin. These spaces were further close-knit and scaled-down and the path becomes narrower and more labyrinthine. Crossing the moat, which separates the public and private domain, we are welcomed with a place of worship, a circular structure, used for security purposes and a diagonally aligned structure which cuts off the views to the private spaces totally. The real steepness starts from here and if any enemy manages to successfully cross this grand puzzle path, he stands in front of his own death. It would have been tough for any military enemy to cross this path alive filled with soldiers sitting on top of this puzzle to gun them down through the mouse-sized holes, and as they pass the spaces which get further cramped, there is the poisonous gas awaiting them ...

Human scale is dignified in the solid curves and strong parapet.

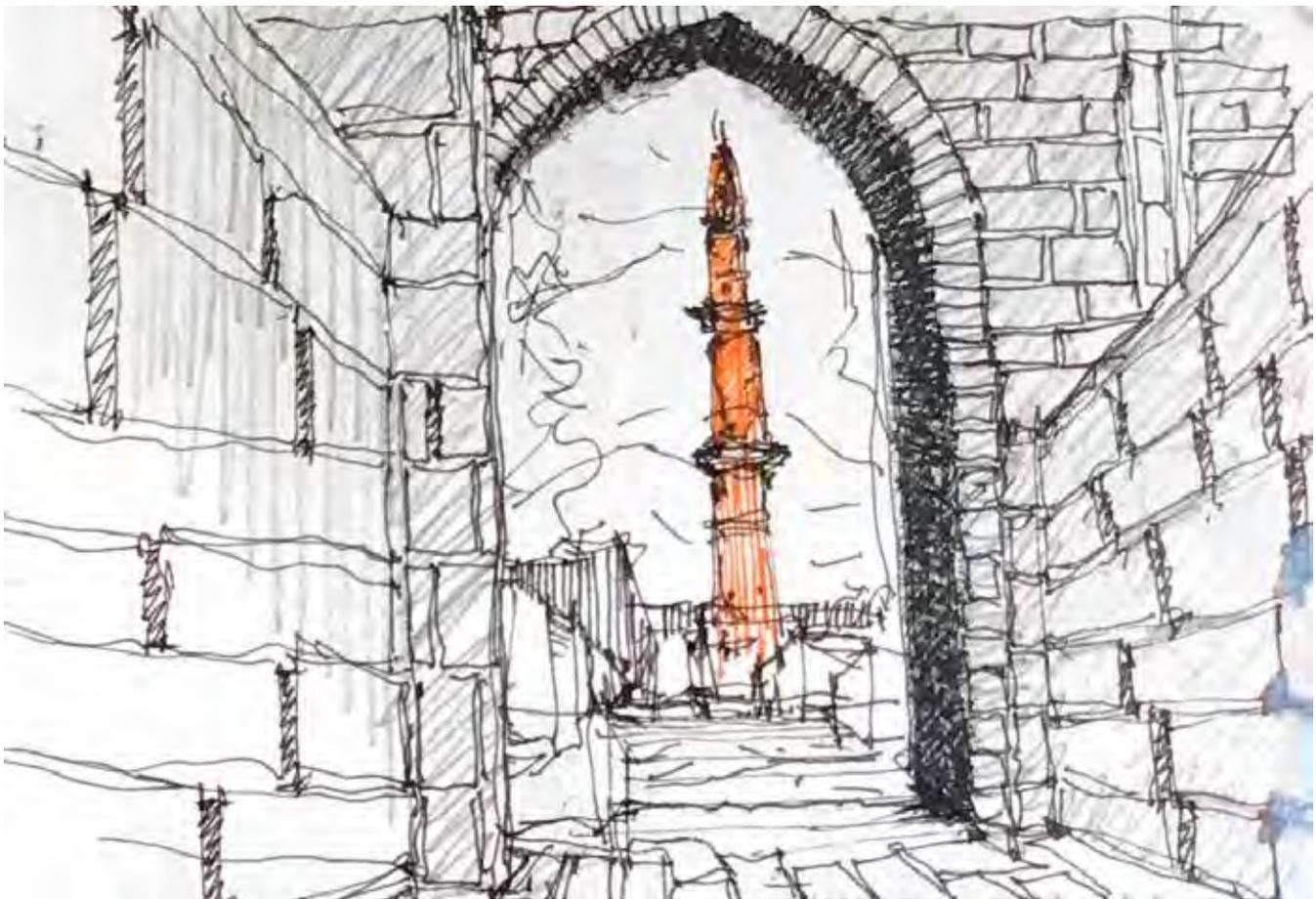




The part of grandeur is always a shared space with the Minar.



The strong skyline adds beauty to the silver sky.



A place for all the eyes to witness the evil eye.



The presence of Minar is knitting all the spaces yet allowing a differentiation.



A place for all the eyes to witness the evil eye.



**Ar. Rajkumar Vaswani** has done B Arch from SPSMBH's College of architecture Kolhapur (1995) and M Arch in urban design from SPA New Delhi (1997). Since then practicing and has designed townships, apartments, institutional buildings, hotels and commercial set ups. He has been socially active in securing the environment through its plantation drive. He is a keen teacher when it comes to getting the right work done for it's desired and designed projects while accommodating at least one sustainable material in every project. Sketching before drafting is his style of seeking the best and unique for the project He is part of various design workshops in Architectural Collages, a speaker and, a jury of recognized panel discussions.  
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# A TRAVEL BACK IN TIME

## A CUBAN SOJOURN

Ar. Chitra Nair

El Capitolio



Cuba, that little island in the Caribbean, romanticised beyond measure, the land famed for the ‘Revolution’, Fidel Castro, Che Guevara, Ernest Hemingway, cigars, music, symbol of defiance against the mighty Capitalists....These were the images etched in our minds when we thought of travelling to Cuba and yet we knew that those images were as jaded as the famous ‘Revolution’.

We were a small group of architects and traveller friends on a curated tour, to Mexico and Cuba, by World Architecture Travel (WAT). After completing a sumptuous and overwhelming

Mexican tour, we flew down to Havana, for our Cuban Sojourn without an inkling as to what to expect, though nothing could have prepared us for the experience awaiting us.

We landed at the Jose Marti Aeropuerto Internacional, Havana on 25th May, 2018, to a cloudy, rain-washed opening scene. The airport, built in 1930 and renovated many times over the years, reminds us of a brutalist, modernistic structure, woefully in need of maintenance. The ‘red’ trimmings visible from the sky, had been carried forward into the interior and exterior colour palette of mainly grey and red.



Street Art

The transit to our Hotel Sevilla in the city, took more than 2 hours or so it seemed, for a distance of just 15kms as we were being transported back in time to another world, warped in the 1930's or 40's. Everything seemed to have slowed down around us. Vintage cars in colourful hues rambled across the streets along with a few horse driven carriages.

As we entered our 5 star Hotel Lobby, came our first culture shock. There were no computers at the Reception, no typewriters either, just a huge Ledger Book to write down our names and Room numbers with a classic fountain pen. We were each welcomed with a neatly handwritten Welcome note and a glass of the local Cuban rum and delectable snacks. Yes, it took quite a long while to finally settle us in our rooms. Welcome to CUBA!

Old Havana or 'Habana Vieja' reflected Cuba's historical turbulence through its magnificent yet crumbling edifices in carved stone and masonry. Founded in the early 16th century by the Spanish explorers, Havana was strategically located to become an important Port-of-call for ships traversing to and from the New World. As the city prospered, it grew around its five main plazas, beautifully laid out with cobbled pavers and intricate detailing. From these Plazas we witness the conflating yet rich ensemble of facades in Baroque to Art deco, to Neo classical, to Art Nouveau styles, stretching themselves to their seams, all over the city.

The city, today, is a UNESCO Heritage site and its architectural richness is linked to its historical influences. Many great men



Havana City Scope



Home of Hemingway

have contributed to its history, Jose Marti, the Nationalist Poet, also known as the 'Apostle of Cuban Independence' being one among them, His statues and memorials are found all over the city.

Cuba gained its independence from the colonial rule of Spain in 1898, through the Cuban Wars of Independence and the direct support of the United States military, which occupied Cuba and directly controlled it until 1902. Though the Republic of Cuba was formally installed in 1902, and the United States relinquished direct control, it continued to influence the Cuban Govt, through the dictatorship of Fulgencio Batista until the Cuban Revolution led by Fidel Castro overthrew the regime in 1959. These major events have left their indelible mark on the city and its way of life.

Hotel Sevilla, where we stayed, was an iconic edifice of over 150 rooms, with great historical significance, built in 1908 as a classic example of Moorish architecture and detailing, a tower was later added in 1929. It had hosted the rich and famous, artists and writers, politicians and the mafia. Notorious mafia dons like Al Capone and Batista gambled their high stakes within these walls. It also stood witness to some of the most significant events in Cuban history when the Cuban revolution led by Fidel Castro in 1959 took over the State.

Ideally located adjacent to the famous Paseo del Prado, Hotel Sevilla, made it convenient to explore the city on foot. The Paseo del Prado, a tree-lined grand boulevard with terrazzo walkways, marble benches and brass lions, creates a surreal



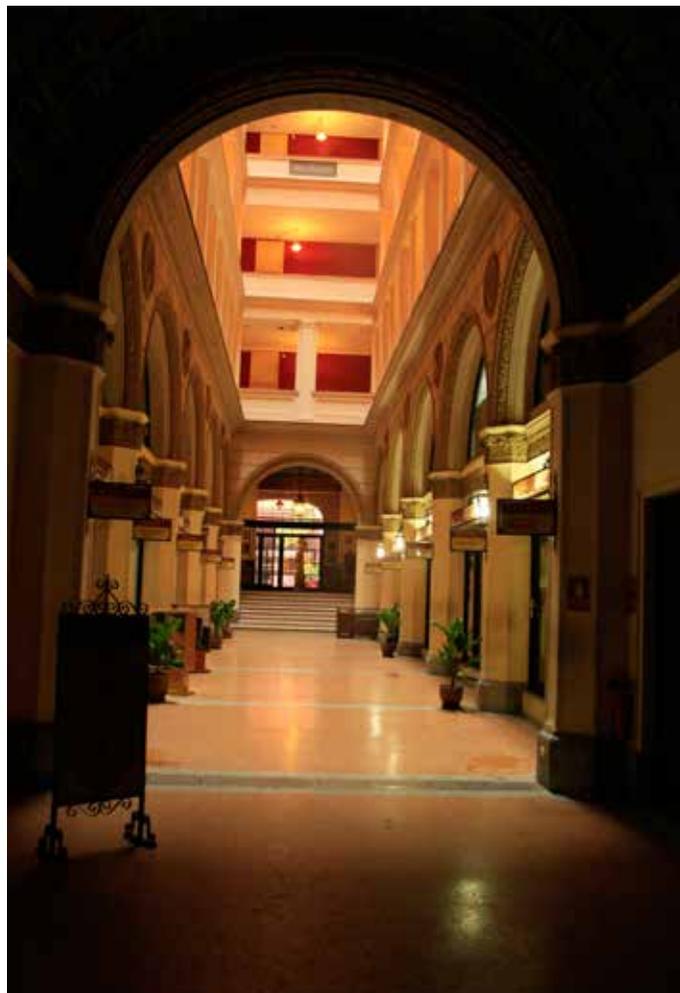
Hotel Seville

journey into a bygone era. People, young and old, can be seen waltzing to music on the sidewalks on weekends and holidays. We were amused to find small scattered groups of people gathered at the points where free Wifi was available. The internet was State controlled and very expensive. Cuba worked with two currencies, the Cuban Peso (CUP) for tourists and the CUC for the Cubans. It was a complex system introduced to enhance the Cuban economy

As we start to explore the city, the next day, along with our esteemed Guide, Professor and HoD of History, University of Havana, we are regaled with stories from Cuban history and the revolution. We understand that Building ordinances in the 19th and 20th centuries have helped preserve the integrity of the architectural richness honouring its Caribbean, Spanish, French and British roots.

We begin with the **El Capitolio** (National Capital Building). Inaugurated in 1929, now restored, this magnificent piece of architecture is awe inspiring with its massive flight of stairs and brass sculptures, the tallest building in the city, it resembles the US Capitol building but was in fact, inspired by the Pantheon of Paris. A blend of Neo-classical and Art Nouveau styles, it was the seat of the Government until 1959. While walking to the El Capitolio, we meander through the innumerable heritage buildings, along the streets and around the plazas, enjoying the beautiful imagery of colourful graffiti combined with the intricate detailing of the baroque style. Many of the buildings have been restored and converted to hotels, shops and offices, some have been distinctly altered to combine modernistic detailing. Since the State controls most of the buildings, financial constraints are evident in the upkeep of some of these beautiful examples of Cuban heritage.

The Museo Nacional de Bellas Artes (National Museum of Fine Arts), designed and built in the 1920's is a fascinating treasure trove for art aficionados. Spread over two buildings with grand staircases and stained glass roofed atriums, original collections and Masterpieces from the European Masters, the likes of, Rembrandt, Van Gogh, Paul Gauguin, Monet, Manet and many more, are displayed along with ancient Art from Egyptian to Roman ages. The Palacio de Bellas Artes is Cuban art from the 17th century to the present day. An exhaustive yet rewarding experience albeit with a tinge of regret at noting the lack of maintenance. Yet, it's heartening to note that they now have a refurbished website for those interested.



Hotel Seville



Jose Marti Airport



Jose Marti Memorial



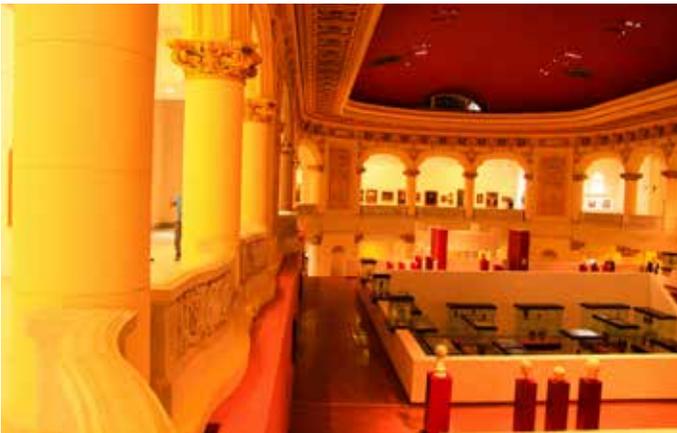
PLaza Havana



Mural of Pre History



Street Art



National Museum of fine arts



The City Over Paseo Del Pardo

Facing the Parque Central, one found the magnificent Gran Teatro de La Habana, designed by Belgian architect Paul Belau and built in 1915 with sculptures by the master sculptor Giuseppe Moretti, it happens to be one of the world's largest opera houses. Sadly, we missed witnessing a famous ballet as the tickets were sold out.

Next on the itinerary, was a visit to the Fortaleza de San Carlos atop the La Cabana hill overlooking the Bay of Havana. A Spanish fort built in 1770, was turned into a military prison during the notorious regime of Batista. Here we find the massive statue of The Christ of Havana, facing the Bay, seemingly like a protector, it's the work of Jilma Madera in 1953. Next to the statue is the Museo de Comandancia del Che, the office of Che Guevara with many of his personal belongings preserved there.

The Plaza de la Revolución, formerly the Plaza Civica before the revolution, is the largest plaza in the city and also has the Jose Marti Memorial, a 109m gray and white marble tower overlooking it. Dedicated to Modernistic government buildings with iconic images of Che Guevara and Fidel Castro on their facades, surround the Plaza.

Another major edifice, we were fortunate to visit, is the historic Hotel Nacional de Cuba built in 1930, it's a World Heritage Site and a National monument, which continues to be a fully functional 5-star rated hotel overlooking the Gulf of Mexico, with 457 rooms and exquisite, sprawling lawns. The hotel has hosted the greatest public figures of the world and the famous Hollywood stars.

We also visited the Universidad de La Habana, The monumental structure built in stone dates back to 1728 and continues to function with 25 specialities including Law and Medicine. It is considered to be one the best medical schools in the world.

We also took a short trip to visit the famous Cuban home of Ernest Hemingway. The lovely little cottage, Finca Vigia, is preserved as it was, after his death in 1961, with his collection of books and memorabilia, the two famous boats that inspired his Nobel prize winning book, 'The Old Man and the Sea. A surreal experience for all Hemingway fans.

Evenings were invariably spent discovering the famous cocktail bars around, Sloppy Joes and the famous El Floridita, the historic haunt of Ernest Hemingway for his favourite daiquiri. The walls are covered with old pictures and posters of famous Hollywood stars and movies. We are teleported to another era, entertained with live music and delicious Cuban food, the heady experience forever etched in our memories.

We bid a temporary goodbye to Havana on 28th May, driving towards Trinidad, considered to be one the most beautiful little towns in Cuba nestled between scenic mountains and the sea. We were comfortably expecting to travel the distance of 300km in about 4hours. The preceding couple of days had been rainy, yet on the day, the weather was cloudy but fine. The wide, cemented roads were near empty. We were pleasantly surprised to see Mango orchards on either side of the highway. We stopped to collect water bottles on route, at a small wayside café. The owner was staring at a small television, listening intently. Noticing that we were tourists, he asked us where we were headed. We were shocked to learn from him that the latest news on TV showed that Trinidad had been flooded by a heavy cloud burst and most bridges leading to it had been washed away. We were stumped, our hotel accommodations that had been arranged would have to be cancelled. But more importantly, we had to deroute to a new destination. In any other country, we would have known before our departure, but then, we were in Cuba... Telephones hardly work, television is controlled, almost nil internet, limited fuel stations! The Café owner, the van driver and our guide, discussed possible alternatives and before we lost more time, we headed to Vinales, a quaint little town, in the Province of Pinar del Rio. Good fortune and the helpful Cuban people saved our day.

We reached the hilly town by evening and settled comfortably into a few lovely homestays. The weather was chilly and the little town seemed to be from a film set of a Hollywood western. We almost expected gun slinging cowboys walking out of the many little bars on the only promenade in town. Almost all the little cottages in town had opened up a couple of rooms as homestays. It was a wonderful experience to share a home with the local people. We learned from the home owners that all food and clothing was rationed by the State as everything was available only in limited quantities. Was in for a pleasant surprise to see the 12 year old grand-daughter of our host, binge watching dubbed Hindi serials with pirated CD's. She was quite unhappy that the lead romantic pair hugged but never kissed! Within the restrictions and constraints everyone was happy and healthy. Education and medicine were free though unemployment

was high. I almost envied their simple and contented way of life. We were surely and truly in a Time warp into the past.

The next morning we visited a tobacco farm, making the famous Cuban Cigars. We were greeted by an extremely handsome Cuban farmer wearing his Stetson hat, living in a small house on the farm. He cultivated tobacco and dried the leaves in a large shed near his house. He was happy to show us, but for a small price, the way the tobacco leaves are dried, treated and rolled before being cut to perfect cigars. The farmer also grew corn and vegetables, had a barn for cows and oxen used for ploughing. There were pigs and chicken too. The whole setting looked like a scene out of a movie, probably the reason why the Valley is a UNESCO World Heritage Centre.

The next day, we visited the famous 'Mogote' hills, natural karst rock formations originally formed 160 million years ago. The gigantic work 'Mural of Prehistory' on the mountainside designed by Leovigildo Gonzalez Morillo took 18 artists 4years to complete.

We were at the end of our Cuban Sojourn, what an eye opener our journey has been. So many heartwarming stories left untold.

Cubans are a jolly people. They enjoy their rums, mojitos and daiquiris with a feisty love for music and dance. Art is a way of life for them. The multi-culturist social fabric brought about by centuries of trade between the old and new worlds, though mainly Hispanic in their roots, also has an amalgamation of West African descent, through years of slave trade, the Native American of Coabana and other settlers. The Communist Revolution brought a huge change in the island nation, giving hope to the people by giving them access to education, medicine and respectable livelihood but most significantly, Liberty. But the isolation caused by trade embargoes and sanctions forced on Cuba by the USA has ruined the once thriving economy into an impoverished shadow of its past. Yet, the beauty and richness of the land and people is unmissable. We can hope that the recent changes in Cuba, will open up their economy to better quality of life for the wonderful Cubans.

I am reminded of the famous words of Che Guevara, **'Hasta la Victoria Siempre!' (Ever onward to Victory!)**

Photo courtesy: **Ar.Jayakrishnan K B, Santhosh Kumar**



**Ar. Chitra Nair** Principal and Partner, JCJR Partnership. Established the firm along with Ar.Jayakrishnan.K.B in 1999. Principal and Managing Partner of JCJR Homes established in 2008 Former Jt.Secretary, IIA Kerala Chapter Recipient of the Commendation Award for Best Interiors IIA Kerala Chapter's 'Excellence in Architecture' Award in 2014. Former Jt.Hon Secretary of the Indian Institute of Architects, Kerala Chapter,

Has been actively involved in the activities of the Indian Institute of Architecture since 1994, starting off as Editor of Trivandrum centre Newsletter and co-ordinator of their Magazine 'Open Hand'. Chitra Nair served as the Hon.secretary, Trivandrum Centre for the term 2002-2004 for which she received appreciation for meritorious service to the architectural fraternity from the Indian Institute of Architects, National Council. chitranairvm@gmail.com

# VERTICAL DESIGN STUDIO: A PEDAGOGICAL BREAKTHROUGH

Prof. Shhilpi Sinha

The profession of architecture is one of the most ancient ones and began with the human understanding of habitat and habitable spaces. The history of architecture can be traced to the early man to period which lead to the beginning of early civilizations. As it progressed the profession was appropriated to be attuned to the era it belonged.

In countries of the ancient East, it was among the most prestigious and was open only to the nobility. In ancient Egypt an architect was educated in the school for scribes but usually learned the craft from his family, for architectural skills and methods were handed down from generation to generation. In ancient Greece (fifth to second centuries B.C.) architects were trained in small private schools under the guidance of experienced masters.

Architectural education not only included knowledge of building materials, the construction trade, and constructional elements, but also of geometry, astronomy, history, philosophy, and so on.

In the current times, the profession of Architecture can be understood as an experimental, open profession. With instructional manuals that may or may not be followed, the students are initiated and made to observe, learn, and apply their understanding to the various projects that they do.

There have been numerous ways to make the students of architecture aware about the issues and to improve their understanding of built environment. Books, research papers, write-ups, context studies, case studies, user space analysis,

primary surveys, secondary surveys etc. All of these have been traditionally followed in the architectural education systems across the globe and continue to be the tools adapted by the instructors.

One aspect that has always been overlooked is peer learning. Peer Learning is a learning technique that promotes collaboration and teamwork to gain knowledge. Indeed, it is the learners who, from a concept and different information, must answer a problem without the intervention of a teacher. Each learner is both a recipient and donor of knowledge.

Vertical Studio is one such format in Architectural Education that aides the peer learning and inculcates confidence amongst students of architecture.

The "Vertical Studio" is specifically designed for graduate students pursuing a first professional degree in architecture. The design studios conducted in a vertical format are usually taught in a manner which combines students of differing years of design and drawing experience. Problems are set to maximize opportunities for learning, skill acquisition, and idea dissemination at all levels, from beginning to intermediate, allowing students to progress at their own rate.

The motivation behind "Vertical Studio Teaching" is not only to train Architecture students to solve complex design problems, but also to expose them to teamwork, whereby each group members are interdependent on each other's performance. The primary purpose of the teams is to define their collective as well as individual project scopes and design goals.

The idea behind the Vertical Studio concept, is to provide students with an understanding about different levels of design complexities. It also exposes the students to interdependent social learning. Social learning theory focuses on the learning that occurs within a social context. It considers that people learn from one another, including such concepts as observational learning, imitation, and adaptation and interpretation. It concerns teamwork, problem solving and design thinking. Skills develop best when they are integral to design activity. The vertical studio format helps the students by providing them with:

- i. A growing ability to organize their own time and effort, and when required, that of others and work in a group as a team.
- ii. Developing skills in externalizing their ideas, verbally and visually, for the purpose of self-critique as well as to communicate with/to others



The student learning takes shape through

- i. Investigation of the needs and requirements
- ii. Understanding the problem statements
- iii. Exploring Concepts related to problem solving
- iv. Generating Alternative solutions to the problem
- v. Determining Resources
- vi. Making decisions
- vii. Taking actions



A Parametric vertical Studio in process at Sharda School of Design, Architecture and Planning

The differences between the outcome of Linear Design Studio and Vertical Design Studio can be understood in very simple terms.

Linear Design Studios are very rigid, but the process is very streamlined.

- The studios are conducted very laterally.
- Peer learning is limited to ones' batchmates.
- Skills are limited to ones that are taught in that particular year.
- Zero collaborative learning from Seniors/ Juniors.
- Affinity and Associational value with the institution is missing.
- Lacks simulation of Real-life Industry Experience.
- Individual output.

Vertical Design Studios are based on the fact that every student has a skill that can contribute to the project.

- The existing skill sets are enhanced through mentoring.
- Peer to peer interaction in a vertical group which consists of Seniors as well juniors.
- Wholesome learning experience comprising a high of brain storming
- interactions at all stages simulating a real-life scenario.
- It equips them with an ability to work as a team member as well as a team leader fostering mentorship .
- Enriching experience with augmented skills sets.
- Communication plays a key role in the studio.
- Problems are set in order to maximize opportunities for learning, skill acquisition, and idea dissemination at all levels, from beginning to intermediate, allowing the students to progress at their own rate.



Aurora: Vertical Design Competition at Sharda University School of Architecture and Planning



The learnings and advantages of vertical studio format are very many.

- There is a better clarification of tasks
  - Everyone has an accountability towards the outcome
  - The studio involves intensive analysis at every stage
  - Diverse and creative solutions emerge out of various skillsets
  - More work is accomplished in shorter time
  - Increased interactions amongst peer groups
  - New work strategies
  - Shared responsibilities
  - Development of soft skills along-with presentation techniques.
  - Students feel more comfortable and open when interacting with a peer
- It considers that people learn from one another including concepts such as observational learning, imitation, adaptation, and interpretation.
- Helps develop students' skills in externalizing their ideas verbally and visually for the purpose of self-critique as well as to communicate with/to others.



### Communication is the key

Vertical Studio deliberately brings the thinking to the surface, to make problem solving visible. The mentor's thinking is made visible to the team and vice versa. It also breaks the hierarchy in the peer group and provides the students a growing ability to organize their own time and effort, and when required, that of others.

Inferring from above, pedagogically, vertical design studio can open new avenues for the students of Architecture with varied skill sets wherein there is a massive involvement of high emotional quotient and understanding of peers.



**Prof. Shhilpi Sinha** is an eminent academician and urban designer. Having graduated from TVB School of Habitat Studies (1995) and Post graduated from School of Planning and Architecture (1998), she not only guides and mentors her team of academicians to ensure that students are exposed to the best of the teaching methodologies, but also ensures that they develop out of the box thinking and contribute to the larger good of the society. She encourages an open learning environment where students are initiated into hands-on and experiential learning. At the same time, she is a firm believer in using knowledge for the betterment of living conditions and creating a legacy to make an impact on the ecosystem. [shhilpimehra@gmail.com](mailto:shhilpimehra@gmail.com)



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**IIA SPORTS AND CULTURAL COMMITTEE**  
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**IIA TAMILNADU CHAPTER**  
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**29<sup>TH</sup> SEP 2022 - 2<sup>ND</sup> OCT 2022**

We are thrilled to invite you to celebrate the union of Architects through this Occasion

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 IIA Tamilnadu

**Organising Team**

Ar. Mohamed Hayas  
 09894081639

Ar. Maheshwaran  
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# NEWSLETTER JULY

## 21<sup>st</sup> ARCASIA ASIAN FORUM OF ARCHITECTS (ARCASIA), MONGOLIA. PROGRAM

Time UTC+8	Day 1 Sep 4, 2022 (Sunday)	Day 2 Sep 5, 2022 (Monday)	Day 3 Sep 6, 2022 (Tuesday)	Day 4 Sep 7, 2022 (Wednesday)	Day 5 Sep 8, 2022 (Thursday)	Day 6 Sep 9, 2022 (Friday)
09:00	Booked Hotels	Best Western Premier Hotel (Soyombo & Suld Halls)	Transfer to the Exhibition Site	Visit Chojjin Lama Temple Museum & City / Shopping Tour	The Government Palace	Departure of Delegates
09:10	Arrival of Delegates	Office Bearer's Meeting /Hybrid/			"Misheel" Expo Center	
09:40			Committee Meetings (ACAE, ACPP, ACYA, ACGSA, ACSR) /Hybrid/	Opening of ARCASIA Awards for Architecture 2022 Exhibition		Welcoming Addresses by Prime Minister, Presidents of ARCASIA and UIA /Hybrid/
10:00	Lunch	Keynote Speech by the Minister of Construction and Urban Development /Hybrid/			Forum 1 /Hybrid/	
10:30			Meetings and Forum sessions will be held in the Best Western Premier Hotel	Keynote Speech and Q&A /Hybrid/	Photo Session	
11:15	Committee Meetings (ACAE, ACPP, ACYA, ACGSA, ACSR) /Hybrid/	ARCASIA Council Meeting /Hybrid/			ARCASIA Council Meeting /Hybrid/	Keynote Speech and Q&A /Hybrid/
12:00			ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/		
13:00	ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/			ARCASIA Council Meeting /Hybrid/	Keynote Speech and Q&A /Hybrid/
13:40			ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/		
14:20	ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/			ARCASIA Council Meeting /Hybrid/	Forum 3 /Hybrid/
15:00			ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/		
15:30	ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/			ARCASIA Council Meeting /Hybrid/	Forum 5 /Hybrid/
16:10			ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/		
17:00	ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/			ARCASIA Council Meeting /Hybrid/	Forum 5 /Hybrid/
18:00			ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/		
19:00	ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/			ARCASIA Council Meeting /Hybrid/	Forum 5 /Hybrid/
21:00			ARCASIA Council Meeting /Hybrid/	ARCASIA Council Meeting /Hybrid/		
	Wellcome Reception	AAA 2022 Presentation Ceremony and Reception /Hybrid/			Mini Naadam	Friendship Night /Hybrid/

Not open to the public      Open to the public



21<sup>st</sup> ASIAN FORUM OF ARCHITECTS

**THE FUTURE OF SUSTAINABLE URBAN DEVELOPMENT**

Ulaanbaatar, Mongolia  
**2022.09.04-09**

**From virtual world to Mongolian Ger**

"Zoom meetings have no space - it is flat and 2D. For the last (almost) three years, in meetings of ARCASIA, we have already grown tired of seeing each other in the computer screen. Meeting each other in person, in the vast slopes of Ulaanbaatar will be an enormous boost for our collective work spirit. This year, Forum-21 will focus on Sustainable Urban Development. And working online-only year after year is not sustainable at all!

Mongolia may be too far... plane tickets may be a bit expensive... but please do try to visit. It will be more than worth it, not only personally, but also communally. Let's hold our hands together again in Mongolia."

**Dr. ABU SAYEED M. AHMED**  
President, ARCASIA

### COA NEWS

The following members were elected to the Executive Committee of Council of Architecture, on 16th July, at New Delhi. The 5 Members were elected unopposed.



**Ar. Nand Lal Chandel**



**Ar. Punit Sethi**



**Ar. Lalichan Zacharias**



**Ar. P. Vaitianadin**



**Ar. Ramesh Kumar**

Ar. Nand Lal Chandel, Ar. Punit Sethi and Ar. Lalichan Zacharias are IIA National Council Members. Congratulation to all EC members of COA



“Hand book of Specifications for Buildings – For students of Architecture and young professional Architects” – Volume- 1 was recently released by its publishers- Priyadarshini Institute of Architecture and Design Studies (PIADS), Nagpur; authored by Prof. Ramesh Bhambhani and late Prof Kanahaiyalal Mokha both senior Professors for long time associated with PIADS.

Prof Ramesh Bhambhani is TRUSTEE of THE INDIAN INSTITUTE OF ARCHITECTS and also Fellow of Institute of Town Planners - India and Life member Indian Concrete Institute.

Prof Ramesh Bhambhani and Late Prof Kanahaiyalal Mokha are well known names both in the field of Academics and Profession.

Specifications for Buildings; its utility, role, importance in execution of almost every building project however big or small; without doubt and indisputably is very crucial.

However though unfortunate and sad; proper and enough study and reference material on this subject is not available; which can be used and relied upon especially by beginners – such as students, young professionals and even new faculty who have little or practically no exposure to the knowledge and the complexities of ‘Specifications’ and have not in true sense understood the nuances, the complexities of this subject especially in relation to its interpretation and applicability.

This book as per the words of authors is especially addressed and crafted to enable the students of Architecture, young faculty teaching this subject as well as for young Professional Architects to get a thorough understanding of this subject – a subject which is one of the ‘Core’ subject – a subject both in learning and practicing Architecture.

In the words of Ar. Sapna – Chief Architect, Punjab and Vice- President, Council of Architecture India who has written foreword for this book she states:-

It is indeed heartening to see an endeavor coming to life in the form of a valuable book of, “Building Specifications – primarily designed to give students of Architecture and young graduates an opportunity to acquire expertise about this subject. The book is undeniably a praise worthy efforts by the two learned and accomplished authors. This book is much needed qualitatively as well as quantitative treatise on Building Specifications with a focus on channelizing the learning process towards becoming acquainted on real world application.

The principal forte of this book undoubtedly is its characteristic feature of systematic sequence of knowledge unwrapping. Prof Ramesh Bhambhani and Prof Mokha have taken substantial and pain taking efforts to ensure that every

learner will find it uncomplicated to gather the required subject information. The interrelationship between all the contents of building specifications have been meticulously researched and established by the author. This gives this book a qualitative flavor of assisting the readers to efficiently and effectively relate the relevance of every topic to its respective project circumstances. The purpose of book as a tome of applied knowledge has been efficiently achieved.

I am extremely happy that such a book for Building Specifications has been meticulously written with the spectrum of stake holders and their specific needs taken into consideration. It indeed is a pleasure to see this book become a reality and expect it to become an indispensable companion of anyone who wishes to know more and better about Building Specifications.

## IIA-Maharashtra Chapter

### Brihan Mumbai Centre Report *Launch of the Manual on Architectural Practice (MAP)*

The Council of Architecture in association with the IIA -Brihan Mumbai Centre had launched the Manual on Architectural Practice (MAP) compiled and authored by Ar. Sandeep Shikre, Ar. Salil Ranadive, Ar. Prashant Sutaria and others. The gala launch, held at Jade Gardens, Worli on 25 June 2022, was attended by over 200 architects from Mumbai, Maharashtra and pan-India. Among these were the COA President- Ar. Habeeb Khan, COA Vice President- Ar. Sapna, IIA President – Ar. C.R. Raju, IIA Vice President- Ar. Vilas Avachat, IIA National Secretary- Ar. Satish Mane, IIA representative to COA (western region)- Ar. Abhijeet Shirodkar, along with the Maharashtra Chapter’s Committee members- Chairman- Ar. Sandeep Bawdekar, Secretary- Ar. Satishraj Jagdale, Treasurer- Ar. Sandeep Prabhu and the Chairmen of various centres of Maharashtra. Eminent architects, Ar. Hafeez Contractor, Ar. Prem Nath, Ar. Ramesh Edwankar, Ar. Ratan Batliboi, Ar. Rahul Kadri, Ar. Uday Gadkari, Ar. Prakash Deshmukh, Ar. Akhtar Chauhan, Ar. Anil Nagrath and Ar. Chandrashekhar Kanetkar were also present. the event was also graced by most of the Principals and Heads of colleges of architecture in Mumbai Metropolitan Region. The Chief Guests for the occasion was Ar. Madhav Deobhakta, Ar. Brinda Somaiya and Ar. C.R. Raju.

The Manual was launched at the hands of Ar. Madhav Deobhakta. It will also be launched in 15 cities across the country. It comprises 5 volumes which has guidelines for: (1) *Architectural Practice* (2) *Engagement of Architects and Code for Competitions* (3) *Architectural Contracts* (4) *Architectural Services and Fees* (5) *Management of Firms*.



MAP Launch

The Manual will be available at online at : [https://www.coa.gov.in/architectural\\_manual\\_practise\\_show.php?similar=1&pub\\_cat\\_id=5&pub\\_id=49&lang=1](https://www.coa.gov.in/architectural_manual_practise_show.php?similar=1&pub_cat_id=5&pub_id=49&lang=1) at a concessional price of Rs. 1000 upto 31st July 2022. Thereafter the price will be increased.

### **Maharashtra Chapter Meeting**

On Sunday 26 June 2022, IIA Brihanmumbai Centre hosted the Maharashtra Chapter meeting at the Juhu Emerald Hotel at Juhu at 11:00 am. The host Centre welcomed the Chapter Chairman, Ar. Sandeep Bawdekar, Secretary Ar. Satishraj Jagdale, Treasurer Ar. Sandeep Prabhu, IIA representative to CoA (western region) Ar. Abhijeet Shirodkar, Chairman of various Centres and other committee members of the Chapter. The meeting commenced with a presentation by Accelerated Cleaning Systems (ACS), experts in the technology and solutions related to waste-water treatment, rejuvenation and treatment of water bodies, pool disinfection, health and hygiene, which are all green solutions.

Thereafter, the meeting was called to order to discuss various matters:

- Treasurer Ar. Sandeep Prabhu informed about the revalidation of GST will be resolved soon.
- Rs. 3 Lakhs were pledged towards the writ petition to be filed by Aurangabad Centre.
- The Centres and architects who had recently won the awards at the NatCon and IIAPL-2021 were felicitated
- Support for the teams attending the IIAPL to be held at Pondicherry in September 2022

The meeting ended with a vote of thanks by Ar. Satishraj Jagdale and lunch thereafter.



Maharashtra Chapter meeting

### **IIA-Assam Chapter**

#### **ART COMPETITION on the occasion of WORLD ENVIRONMENT DAY organized by IIA Assam Chapter on June 5th, 2022**

On the occasion of World Environment Day 2022, IIA Assam Chapter organized an Art Competition on 5th June 2022 among children of different age groups up to 8th standard at Srimanta Sankardev Kalakshetra in Guwahati. The themes for the art competition were, a. Clean and Green Earth, and b. Only One earth. We received an overwhelming response from students and guardians for the art competition, where a total of 180 students took part in the event. After analyzing

all the exceptionally impressive drawings by the students, the judges declared the results of the competition and announced the names of the winners, who were presented certificates and cash awards by the Chairman Ar. H. K. Rajkhowa on the same day. The chapter also distributed certificates of participation to all the students.



Children participating in the Art Competition on World Environment Day

#### **ARCHITECTS MEET on the occasion of WORLD ENVIRONMENT DAY organized by IIA Assam Chapter on June 5th, 2022**

An Architects Meet was organized by IIA Assam Chapter at Vivanta by Taj, Guwahati on the occasion of World Environment Day 2022 which was sponsored by White Nest Pvt. Ltd. The meet saw a wonderful gathering of architects from around the state and several discussions were held on the responsibility of architects individually as well as a community towards safeguarding the environment.

#### **ARCHITECTS MEET organized by IIA Assam Chapter on June 25th, 2022**

An Architects Meet was organized by IIA Assam Chapter at The Lily Hotel on June 25th 2022 which was organized by Prince Piping Systems. The event began with lighting of the auspicious lamp, which was followed by the Chairman's Address by Ar. Hiranya Kumar Rajkhowa. Ar. Bikram Aditya Nath delivered a presentation on Pop-Up Gallery - Origami Structure, while Ar. Abhinabh Rajkhowa presented on Urban Revitalization of Jalukbari Junction, Guwahati. The latest issue of CONCORD, the chapter's quarterly journal was also released during the event, the theme for the issue being Research and Academic Work. The event ended with a Vote-of-Thanks by Ar. Pankaj Phukan.



Members of IIA Assam Chapter during the Art Competition

## IIA-Punjab Chapter

**Informed Design for a Post-Covid world an endeavour by IIA**  
Organizer's name – Lovely School of Architecture and Planning and IIA Jalandhar and IIA Punjab  
Total number of participants attended the event: 110  
**Online**

Acquainting students, and faculty about the power of Architecture to create healing and healthy spaces by deliberation on Designing for a Post-Covid world. Ar Harbinder Singh Birdi, Designation and Organization: Partner, Head of Infrastructure and Transport, Hawkins Brown Architects spoke on spatial organisation the event by IIA Jalandhar center, Punjab chapter brought forces on factors like, contexts, climatology, location, topography, vegetation, approachability, connectivity user profile group, their tangible and intangible aspiration etc. This wonderful session was attended by 106 students and 04 faculty of Architecture. Making the concept of highly immunised spaces a reality, an in-depth analysis of design features post-covid analysis of the transformative spaces achieved in essential. Participants were enlightened to understand the elements of design to incorporate in buildings that mitigate the effect of the pandemic through design.

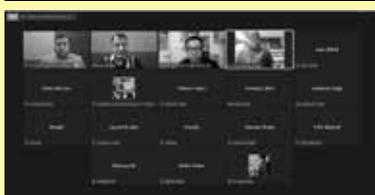
### "IIA Punjab Chapter chairman and LSCL Director Ar. Sanjay Goel shot off letter to Punjab CM Bhagwant Mann"

Seek time for meeting to discuss issues related to Local Government and town planning in the state.

IIA Punjab Chapter chairman and Ludhiana Smart City Ltd. Director, Ar. Sanjay Goel has shot off a letter to Punjab Chief Minister Bhagwant Mann seeking time for meeting to discuss issues related to Local Government and Town Planning in state. The letter read as under:

"This is to request you to kindly give time to interact with delegation of executive members of Indian Institute of Architects Punjab Chapter (IIAPC) regarding many development and architecture related issues of Local Govt., an important portfolio with yourself. The crucial point discussed were as follows;

1. Highlighting the role of Local Government is of utmost importance to provide best amenities and generate revenue
2. Punjab has 14 architecture degree colleges and thousands of qualified architects registered with Council of Architecture working all over state even in small towns. Their role in Smart City development is vital and should be recognized.



3. Best planning and good infrastructure design are as important as agricultural lineage of Punjab. Inevitably, it shall pave way for a brighter future of the state.
4. Ludhiana, Jalandhar and Amritsar all three upcoming smart cities in the state must be best developed along with other cities and towns on priority without any political interference unlike previous governments. Few cities, towns and villages must be an example for others to follow.
5. Even our villages must be more livable and smarter in coming times as we have to control migration of masses from villages to towns and from towns to cities, so that population load on cities is controlled for better quality of life.

Formally requesting the chair for discussion of these issues, Ar. Sanjay Goel has raised a vital concern for the state of Punjab and highlighted the importance of the profession. Admittingly he has pioneered for a great cause.

## IIA-Himachal Pradesh Chapter

### IIA, HP Chapter participated in NATCON 22 organised at Hyderabad by IIA Telangana Chapter w.e.f 14-16 MAY, 2022

Chairman IIA HP Chapter, Ar. Nand Lal Chandel, Vice Chairman, Ar. Vijay Thakur, Member IIA HP Chapter, Correspondent IIA HP Chapter, Dr. Satish Kumar Katwal participated in in NATCON 22 organised at Hyderabad by IIA Telangana Chapter w.e.f 14-16 May, 2022. Dr Satish Kumar Katwal and Ar VP Jaswal member IIA HP Chapter Were conferred with Merit Certificate for recognising their Contribution to the Architecture Profession.

### IIA, HP Chapter participated in Rajasthan Architecture Festival 22 organised at Jaipur by IIA RAJATHAN Chapter w.e.f 20-22 MAY, 2022.

Chairman IIA HP Chapter, Ar. Nand Lal Chandel, Vice Chairman, Ar. Manuj Shardiya, Ar. Ajay Sharma, Ar Neeraj Raghuvanshi, Ar L. N. Mastana, Executive Member, IIA HP Chapter, Ar. Vijay Thakur, Member IIA HP Chapter, Correspondent IIA HP Chapter, Dr. Satish Kumar Katwal participated in in Rajasthan Architecture Festival 22 organised at Jaipur by IIA RAJATHAN Chapter w.e.f 20-22 MAY, 2022. All participated in Heritage Walks organised to city of Jaipur and Amer Fort on 21-22 May, 2022 respectively.

### IIA, HP Chapter collaborated with School of Architecture in Celebrating Environmental Day on 5th June, 2022 at School of Architecture, RGGEC Kangra at Nagrota Bagwan

To highlight the importance of the environment, School of Architecture, RGGEC Kangra and Indian Institute of Architects Himachal Pradesh Chapter jointly is organising an environmental awareness drive for one weeks during 4-10th June, 22 is being organised.

To make it a wider publicity, it was decided by Ar. Nand Lal Chandel, Chairman IIA HP Chapter, Prof. PP Sharma, Director/Principal RGGEC Kangra and Dr. Satish Kumar Katwal, Head School of Architecture to invite other institutions. Accordingly, Prof.

PP Sharma sent a request invitation to Chairman IIA with a request to bring all executive members along with other IIA Members associated with IIA HP Chapter. Among other invitees were: Principal WRS Govt. Degree College Dehri, Principal Govt Degree College Lanz, Principal Govt Polytechnic Sundernagar, Principal Dr B R Ambedkar Govt Polytechnic Ambota, Principal Govt Polytechnic for Rehan , Principal Govt ITI Jawali, Principal Govt ITI Dhameta.

The environmental awareness drive for one week was inaugurated on 4th June 2022 by Prof. PP Sharma, Director/Principal RGGEC Kangra as Chief Guest. Dr Satish Katwal Head School of Architecture welcomed Prof. PP Sharma for sparing his valuable time and motivating students of architecture. Amongst other persons who remained present during the inaugural include: Ar Karan Sharma, Ar Rohit Thakur, Ar Harshoday Bhardwaj, Ar Geetika Kaundal, Ar Kalpna Thakur all Assistant Professors Architecture at School of Architecture RGGEC Kangra, and Ar Anil Pundeer, Assistant Professor Mechanical Engineering at RGGEC Kangra.

The Environment Day 2022 was celebrated on 5th June 2022 at School of architecture, Rajiv Gandhi Govt Engineering College, Kangra at Nagrota.

**IIA, HP Chapter Sponsored the International Yoga Day at Govt. Polytechnic for Women at Rehan, Kangra Day on 21st June, 2022.**

Chairman IIA HP Chapter, Ar Nand Lal Chandel Sponsored The Sponsored The International Yoga Day At Govt. Polytechnic For Women At Rehan, Kangra Day On 21st June, 2022. Around 10 academic institution like Schools, Colleges and it is participated in the Event. IIA HP Chapter honoured all participants with mementoes on the occasion. Chairman IIA Chapter Ar. Nand Lal Chandel appealed to adopt Yoga as integral part of their daily routine to extract the maximum health benefits. Dr Satish Kumar Katwal, Principal, Govt. Polytechnic for Women Rehan Welcomed all participants on this Occasion.

**IIA-Kerala Chapter, Malappuram Sub - Centre**

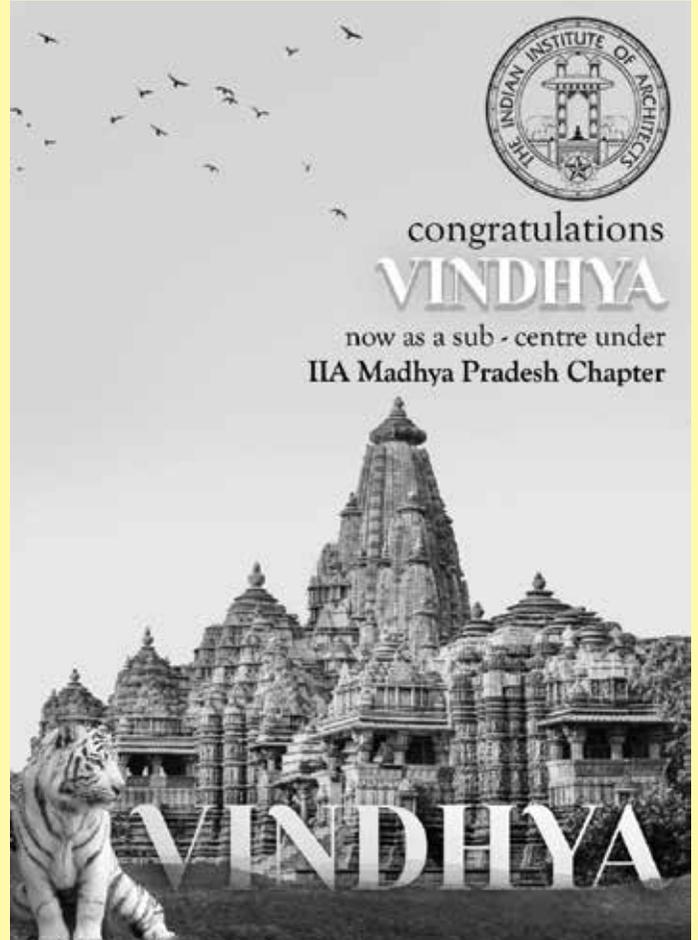
IIA Malappuram Sub Centre will be launched in September 2022. A pre-launch event was conducted with 150 architects at Woodbine Foliage on 29th July 2022 at 6pm. Ar. George Seemon (STAPATI Bangalore) who enlightened the crowd with his presentation, was the chief guest for the event. Ar. Vinod Cyriac (Vice Chairman, IIA Kerala Chapter) explained the importance and strength of IIA. Ar. Vivek PP (Chairman, Calicut Centre) elaborated the activities of IIA. Ar. PK Aslam, Ar. Mohammed Afnan, Ar. Mahir Aalam, Ar. Arjun Narayanan Ar. Sidheek Ali, Ar. Nabeel and Ar. Fayis Muhammed were heading the organising committee comprising of 15 architects. The event turned out to be a memorable one and ended on a high note with an exiting music band performance.



Recipient of IIA Certificate of Merit 2021-22 during National Convention held at Hyderabad during 14-16 May 2022.



Participants on Environment Day at School Of Architecture



# WELCOME NEW IIA MEMBERS

8<sup>th</sup> Council Meeting Held at Indore on 22<sup>th</sup> July, 2022.

Sr. No.	Associate to Fellow	Memb. No.	Place
1	Ar. Kshitiz Manu	F19508	Rajasthan
2	Ar. Manuj Shardia	F15307	Himachal Pradesh
3	Ar. Basant Kumar Soni	F17784	Madhya Pradesh
4	Ar. Pranav Kumar	F15409	Ahmedabad
5	Ar. Jayesh Hariyani	F12906	Ahmedabad
6	Ar. Sonia	F17181	Gurgaon

Sr. No.	Direct Fellow	Memb. No.	Place
1	Ar. Ashish Patankar	F25592	Brihan Mumbai
2	Ar. Prabhat Gautam	F25593	Kumaun
3	Ar. Saumitra Agarwal	F25594	Gurgaon
4	Ar. Ira Khulbe	F25595	New Delhi
5	Ar. Rimpesh Sharma	F25596	Gurgaon
6	Ar. Jagan Mohan Ch	F25597	Telangana
7	Ar. Anil Nimesh	F25598	Uttarkhand
8	Ar. Kanamata Reddy Ravikumar Reddy	F25599	Telangana

Sr. No.	Associate	Memb. No.	Place
1	Ar. Aatira L. Zacharias	A25600	Karnataka
2	Ar. Vishal Prasad Purohit	A25601	Odisha
3	Ar. Shanil T P	A25602	Kochi
4	Ar. Rajeev Ratan Meena	A25603	Rajasthan
5	Ar. Abhishek Soni	A25604	Rajasthan
6	Ar. Nikita Bhuraria	A25605	Rajasthan
7	Ar. Mayuresh Mukund Pramila Keni	A25606	Thane
8	Ar. Altamash Iqbal Momin	A25607	Thane
9	Ar. Diksha Babasaheb Manisha Bhole	A25608	Kalyan
10	Ar. Ashukesh Mahesh Mangala Tikare	A25609	Thane
11	Ar. Pranali Sunil Murkute	A25610	Kalyan
12	Ar. Sayali Janardan Pooja Dange	A25611	Thane
13	Ar. Tanvi Ravji Pranali Rane	A25612	Thane
14	Ar. Saurabh Santosh Seema Ambre	A25613	Mumbai
15	Ar. Surabhi Uday Gadkari	A25614	Pune
16	Ar. Mahesh Rameshwar Bangad	A25615	Pune
17	Ar. Pranal Prakash Sandhya Sawant	A25616	Thane
18	Ar. Parth Vilas Sangeeta Sawant	A25617	Thane
19	Ar. Ankita Chandrakant Karuna Mhaske	A25618	Thane
20	Ar. Ronak Ramesh Manju Mota	A25619	Thane
21	Ar. Prasad Ravindra Vandana Bhandarkar	A25620	Brihan Mumbai
22	Ar. Pankaj Keshav Kanal	A25621	Thane
23	Ar. Mrinalini Vallabh Katre	A25622	Thane
24	Ar. Deven Amrutlal Panna Bhadesiya	A25623	Brihan Mumbai
25	Ar. Gauri Omkar Damle	A25624	Thane

26	Ar. Monika Samit Bodkhe	A25625	Thane
27	Ar. Jyoti Jadhav	A25626	Thane
28	Ar. Avanish Kumar Gangwar	A25627	Uttar Pradesh
29	Ar. Himanshu Mangla	A25628	Karnal
30	Ar. Akshay Chandrakant Buranapure	A25629	Solapur
31	Ar. Kisan Mahadeo Hanchate	A25630	Solapur
32	Ar. Viral Girish Daksha Udeshi	A25631	Solapur
33	Ar. Yashika Sachdeva	A25632	Haryana
34	Ar. Rajat Singh Bhati	A25633	Faridabad
35	Ar. Manas Tejpal Chordiya	A25634	Pimpri Chinchwad
36	Ar. Nishita Sunil Naik	A25635	Pune
37	Ar. Resmi Das	A25636	Kochi
38	Ar. Vishnu P Prakash	A25637	Kochi
39	Ar. Koshy P Koshy	A25638	Kochi
40	Ar. Haritha K P	A25639	Kochi
41	Ar. Shreya Rajvanshi	A25640	Faridabad
42	Ar. Reena Edna Tauro	A25641	Mangalore-Manipal
43	Ar. Deeksha Vasudev Prabhu	A25642	Karnataka
44	Ar. Aayush Jindal	A25643	Rajasthan
45	Ar. Aaditya Sharma	A25644	Rajasthan
46	Ar. Jyotimoy Chaudhury	A25645	Assam
47	Ar. Rajesh Peteti	A25646	Telangana
48	Ar. Sowmiya M	A25647	Thanjavur
49	Ar. Dhaivat Bharatbhai Panchal	A25648	Ahmedabad
50	Ar. Vijay Madhav Sane	A25649	Pune
51	Ar. Nitin Bhatnagar	A25650	Uttar Pradesh
52	Ar. Ritu Nathawat	A25651	Rajasthan
53	Ar. Kshitija Kapoor	A25652	Rajasthan
54	Ar. Ridhu Dhan Gahalot	A25653	Rajasthan
55	Ar. Anubhuti Jain	A25654	Udaipur
56	Ar. Priyank Vipulkumar Dakoria	A25655	Surat
57	Ar. Geetika Sahu	A25656	Raipur
58	Ar. Raj Kaur	A25657	Raipur
59	Ar. Shalin S	A25658	Kollam
60	Ar. Alen Joseph James	A25659	Kottayam
61	Ar. Bharath Raj T	A25660	Kochi
62	Ar. Aganita Pai B H	A25661	Mangalore-Manipal
63	Ar. K R Vishnu	A25662	Mangalore-Manipal
64	Ar. Nishant Gupta	A25663	Brihan Mumbai
65	Ar. Sailangi Mukherjee	A25664	Kolkata
66	Ar. Liya Sunny Anthraper	A25665	Kochi
67	Ar. Mohesh Babu R	A25666	Tiruchirappalli
68	Ar. Gayathri S	A25667	Trichy
69	Ar. Mohamed Moinudeen S	A25668	Tiruchirappalli
70	Ar. Pratik Robin Bakshi	A25669	Solapur

71	Ar. Oceandeep kaur	A25670	Punjab
72	Ar. Sagar Khadse	A25671	Indore
73	Ar. Alkesh Bajpai	A25672	Uttar Pradesh
74	Ar. Amaan Anwari	A25673	Madhya Pradesh
75	Ar. Vandana Singh	A25674	Madhya Pradesh
76	Ar. Shriyam Bajoria	A25675	Madhya Pradesh
77	Ar. Simran Rohit Handa	A25676	Madhya Pradesh
78	Ar. Poonam Jyotikant Shah	A25677	Ahmedabad
79	Ar. Sumit Vijaykumar Mevada	A25678	Ahmedabad
80	Ar. Rakhi Viral Rupani	A25679	Ahmedabad
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82	Ar. Akash Krishnakant Bhatt	A25681	Ahmedabad
83	Ar. Nikulkumar Sureshchandra Shah	A25682	Ahmedabad
84	Ar. Sharen	A25683	Ludhiana
85	Ar. Akshat Jain	A25684	Madhya Pradesh
86	Ar. Abhijit Singh	A25685	Madhya Pradesh
87	Ar. Ishita Pathak	A25686	Madhya Pradesh
88	Ar. Sunira Soni	A25687	Madhya Pradesh
89	Ar. Avinash Shrivastava	A25688	Madhya Pradesh
90	Ar. Ayushee Kulshrestha	A25689	Madhya Pradesh
91	Ar. Karan Singh Yadav	A25690	Madhya Pradesh
92	Ar. Khyati Chaubey	A25691	Madhya Pradesh
93	Ar. Ritesh Kumar Agarwal	A25692	Madhya Pradesh
94	Ar. Palak Agrawal	A25693	Madhya Pradesh
95	Ar. Nishant Singh	A25694	Madhya Pradesh
96	Ar. Neeraj Singh	A25695	Madhya Pradesh
97	Ar. Gyanendra Singh Bamore	A25696	Madhya Pradesh
98	Ar. Deepak Bajaj	A25697	Madhya Pradesh
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173	Ar. Mohamed Sabith P K	A25772	Kochi
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175	Ar. Jeena Francis	A25774	Kochi
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178	Ar. Arun Pattar	A25777	Hubli -Dharwad
179	Ar. C S Hima	A25778	Hubli -Dharwad
180	Ar. Dhawal Bumb	A25779	Indore
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202	Ar. Koppiseti Sriharsha	A25801	Andhra Pradesh
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204	Ar. Kondeti Durgasurendra	A25803	Andhra Pradesh
205	Ar. Shruti Yadav	A25804	Roukerla
206	Ar. Devesh Kedia	A25805	Roukerla
207	Ar. Ajay Krishnan T	A25806	Kannur
208	Ar. Rajiv Goel	A25807	Noida
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214	Ar. Bijal Nayan Parikh	A25813	Brihan Mumbai

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216	Ar. Akshay Purushothaman	A25815	Kannur
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220	Ar. Akankshya Nanda	A25819	Odisha
221	Ar. Neha Singh	A25820	Madhya Pradesh
222	Ar. Tanimu Guha	A25821	Odisha
223	Ar. Jyoti Chhabra	A25822	Noida
224	Ar. Gaurav Agrawal	A25823	Madhya Pradesh
225	Ar. Ankita Agrawal	A25824	Madhya Pradesh
226	Ar. Poonam R Pratima Giri	A25825	Madhya Pradesh
227	Ar. Abhijeet Ravindra Naina Pendharkar	A25826	Madhya Pradesh
228	Ar. Divya Singh	A25827	Andhra Pradesh
229	Ar. Nuhass A K	A25828	Kannur
230	Ar. Tushar	A25829	Haryana
231	Ar. Manas Ranjan Das	A25830	Roukerla
232	Ar. Sachin Prabhakar Pawar	A25831	Madhya Pradesh
233	Ar. Rohan Kumar Mallick	A25832	Roukerla
234	Ar. Mithilesh Mandal	A25833	Roukerla
235	Ar. Anshulata Panda	A25834	Roukerla
236	Ar. Abinash Patra	A25835	Roukerla
237	Ar. Abhishek Nag	A25836	Roukerla
238	Ar. Maitryee Sarangi	A25837	Roukerla
239	Ar. Anshpreet Kaur Sobti	A25838	Punjab
240	Ar. Sandeep Kumar Garnaik	A25839	Roukerla
241	Ar. Debashrita Mohanty	A25840	Roukerla
242	Ar. Tabrej Akhtar	A25841	Ranchi
243	Ar. Mushtaq Ali Ahmed A K	A25842	Tamil Nadu
244	Ar. Tangella Sai Surya Krishna Praneeth	A25843	Andhra Pradesh
245	Ar. Vineet Mohan	A25844	Thrissur
246	Ar. Gomathi M S	A25845	Chennai
247	Ar. Salih C	A25846	Kochi
248	Ar. Shivani Mohan Talware	A25847	Nagpur
249	Ar. Harsh Vardhan	A25848	Ranchi
250	Ar. Ejilina Priyadarshinee	A25849	Roukerla
251	Ar. Bhupinder Singh	A25850	Punjab
252	Ar. Maninderjit Singh	A25851	Punjab
253	Ar. Ishita Garg	A25852	Punjab
254	Ar. R Navaneetha Krishnan	A25853	Chennai
255	Ar. Neha Swapnil Kolhe	A25854	Nagpur
256	Ar. Priyanka Virendra Khare	A25855	Nagpur
257	Ar. Prabhu R	A25856	Nagpur
258	Ar. Bijay Baibhav Ray	A25857	Roukerla
259	Ar. Mohan Jhunjhunwala	A25858	Roukerla
260	Ar. Graham Solomon	A25859	Chennai



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## AWARD CATEGORIES

Architect of  
the Year  
Awards  
JK AYA

### Great Master's/Chairman's Award

Once in 3 years (Next due in 33<sup>rd</sup> JK AYA)

### Green Architecture Award (Environment Conscious Design)

Eligible Countries: India, Bangladesh, Bhutan, Kenya, Maldives, Mauritius, Nepal, Seychelles, Sri Lanka, Tanzania & Uganda

### Indian Architecture Awards (IAA)

Eligibility: Any Indian Architect

### Indian State Architecture Awards (ISAA)

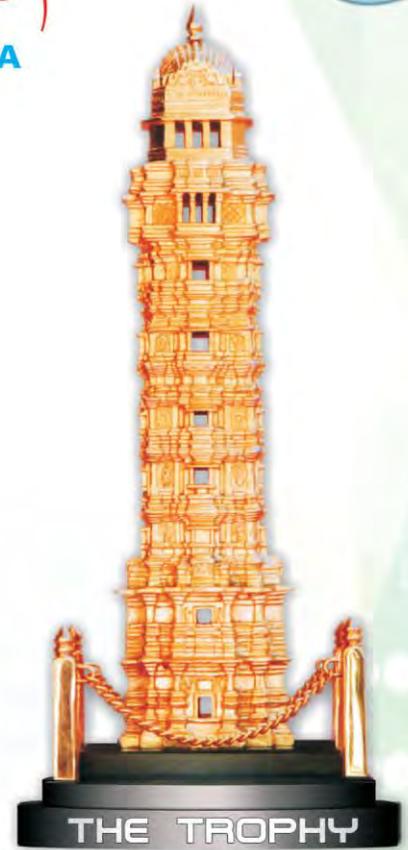
Eligible Status/UT: State by Rotation

### Foreign Countries' Architecture Awards (FCAA)

Eligible Countries : Bangladesh, Bhutan, Kenya, Maldives, Mauritius, Nepal, Seychelles, Sri Lanka, Tanzania & Uganda

### Architecture Student of The Year Award

Eligibility: Final Year Undergraduate students of Indian Colleges



RPS-06/2022

**33<sup>rd</sup> JK AYA shall open for participation for sending entries  
From 1<sup>st</sup> January, 2023.**

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### For Award Information :-

Please Contact Award Secretariat :

**RANA PRATAP SINGH**  
(Administrator JK AYA)

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- ★ JK WhiteMaxX
- ★ JK WallMaxX
- ★ JK TileMaxX
- ★ JK GypsoMaxX



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