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I am a pharmacist & woodworking is my **hobby** on weekends. I use **SketchUp Make** which is free.

I am a **Design Professional** and I use **SketchUp PRO version**.
Dear Friends

We all have lost an illustrious member of the Architectural fraternity with the demise of Padma Shri Dr. J. R. Bhalla on the last day of year 2016.

The Indian Institute of Architects was blessed with his leadership twice, from 1966 to 1971 and again from 1980 to 1983 and his contributions are well documented in his book ‘The Making of an Architect’.

We pray to almighty to bless his soul and give strength to his family to bear this colossal loss.

Further in this issue we have a study of natural ventilation system in the iconic heritage ‘Hawa Mahal’ at Jaipur Rajasthan presented by Prof. Dr. Madhura Yadav and her student Ioana Somion from Romania that can provide guidance to designing eco-friendly building today.

Ms. Jagrati Jain and Dr. Anjali Patil of Madhav Institute of Technology at Gwalior, which draws tangible references from studies of animal habitats which can be useful in the present day architecture.

Ar. Anup Bharti and Ar. Ravish Kumar present a thesis project of re-developing an old defunct power plant into a vibrant city park at Patna, Bihar.

Ar. Akanksha Wakhare presents a paper on stimulative aspects of space in her paper through a case study in Pune City.

Ar. Siddhant Gupta presents the planning process followed in his thesis work on a project for National Institute of Journalism and Mass Communication.

We are sure that these will make an interesting reading material for our readers.

Ar Anand Palaye
Chairman - Publication Board & Executive Editor,
JIIA
Dear Fellow Architects

It was very sad to hear the news of sudden and untimely demise of Padma Shri Dr. Jai Rattan Bhalla on the New Year Eve. During his more than Seven decade long professional career, Padma Shri Dr. Bhalla made enormous contribution to the profession and education of Architecture. We were fortunate to have his continued guidance and advice till his very last.

With his single minded dedication to the profession of architecture, he very deservedly earned the respect and admiration of the Architectural fraternity not only in India but across the world.

During his long career he chaired virtually every professional organization connected with Architecture which includes IIA, COA, CAA, UIA and many more and left behind an indelible impression with his immense contribution in each one of them.

He was not only an accomplished architect but also a freedom fighter, philosopher, thinker and above all a great human being.

The long list of awards and recognitions is a testimony for his achievements and contributions to the society in general and the profession in particular. However in his own words during his acceptance speech on the occasion of the Presentation of the Baburao Mhatre Gold Medal awarded by the Indian Institute of Architects was most satisfying of them all to him.

His advice and blessings, particularly during the last two years have been immensely helpful to me in performing my duties as the President of the Institute.

In his passing away, not only the Indian Institute of Architects but also the Architectural Community all over the world has suffered a loss which cannot be easily replaced.

We at the Institute pray that, his noble soul may rest in peace.

Ar Divya Kush
President,
The Indian Institute of Architects
A TRIBUTE TO AR (Dr.) JAI RATTAN BHALLA

In Ar J R Bhalla’s demise it is indeed but also to the entire Architectural put India on the international President of IIA, he was President of Architects, President of Union Senior Member of World Society in all these organizations was the praise showered by Sir British Architect for Ar Bhalla’s organizations.

Ar Bhalla will also be remembered of 1972. He gave our Architectural status that we truly deserve. As of Architecture (CoA) for Nine on a sound footing. His efforts in Conditions of Engagement and Scale of Fees and Guidelines for Conduct of Architectural Competitions in close collaboration with IIA are well documented. These documents are proof of his vision and hard work.

My first meeting with Ar Bhalla was in 1967 during the Golden Jubilee celebrations of IIA. I was impressed with his noble personality and soft-spoken demeanour. I have had the good fortune to work with Ar Bhalla in IIA, CAA and World Society for Ekistics. As Hon. Secretary of IIA, Ar Bhalla requested me to organize an event for Commonwealth Architects in Mumbai in 1972. He complimented me upon the way that event was planned at a very short notice and conducted. Thereafter I worked with him on CoA committees for three years. My other interaction with him was in Greece during the Delos Symposium in Athens organized by Dr C A Doxiadis. We spent a week together on board a ship along with other international celebrities discussing issues of Human Settlements.

I am deeply indebted to him for encouraging me to hold a Teachers’ Training Program in Ekistics at SPA, Delhi. He opened the week-long program with a lucid introduction of meaning and importance of Ekistics. He helped the participating Teachers to move about safely in Delhi during the Mandal Commission agitation.

His most significant help to Ar Rusi Khambatta (who was then the President of CAA) and Ar Meera Dobhakta (Member, Executive Committee, WSE) as the joint organizers of CAA - WSE Conference in Kovalam, Kerala (1995) was his personal involvement and constant guidance at each and every level of planning and execution. He not only inaugurated it but also spent 3 days with 66 participants from 16 countries. One of the main reasons why that conference became a resounding success was his persevering vision shared constantly with the planning committee members.

Another facet of his life was his involvement in education. He taught Professional Practice at SPA in Delhi for many years. He complimented Meera and self for writing our book “Architectural Practice in India” which CoA published in 2008. On one occasion he told his audience that if you do not read this book you will perhaps be making the same mistakes that other Architects did and had to face the Bar of Council of Architecture.

In his death I have lost a great adviser; so also the entire Architectural Fraternity, an illustrious Architect.

MAY HIS SOUL REST IN PEACE

Prof. Madhav Deobhakta
Past President of IIA
Past President, World Society for Ekistics
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TRIBUTE

OBITUARY

02/01/2017

The name of J R Bhalla is synonymous to the practice of Architecture.

From furthering the affairs of the Institute for several years and more particularly during his terms of his President’s term, was his interest in formulation of all three international organizations such as Architects Regional Council Asia (ARCASIA); Commonwealth Association of Architecture (COA) and Union of International Architects (UIA). He was later President of COA and UIA. The Council of Architecture for which all Indian Architects are grateful evolved due to his relentless efforts.

He will always be remembered by Architects for his immense contribution to Architecture as well as practice of Architecture.

RUSI KHAMBATTA

I had opportunity to meet late Dr J R Bhalla at Delhi in 1975 and at Baroda Workshop on Architecture Education in 1978-79.

Dr Bhalla suggested to me to stand for election on Council of Architecture from amongst Principals of Colleges of Architecture. From 1978 to 1998 I had the pleasure of working under his guidance on the Council, as Ex Committee Member, vice President and on Education Committee of the Council. Late Dr Bhalla showed confidence on me, appointing me on Committee to draft Minimum Standard of Architecture Education and few disciplinary Committees.

I had observed Late Dr Bhalla conducting Council Meetings with full of confidence and positive approach. He dealt the issues with Government Bodies and Ministries coolly and without compromising on respect for Architecture Profession.

We used to discuss how to avoid deterioration of the Minimum Standard, strengthen the educational structure and shortage of faculty members in new institutions. He suggested ways and means to overcome the situation. We jointly prepared norms for inspection of new Institutions.

I used to Visit his office without prior appointment, to discuss issues pertaining to education and Council of Architecture. During his tenure, Council of Architecture moved to our new premises at Lodhi Road. I learned from Late Dr Bhalla, how to keep calm under difficult situation, which helped me to be a successful person.

I am and will always remain grateful to late Dr Bhalla.

PROF SATISH TUNGARE

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The Cheques to be issued in the name of "THE INDIAN INSTITUTE OF ARCHITECTS"
Analysis Of Natural Ventilation Systems In Heritage Buildings: 
A Case Study Of Hawa Mahal, Jaipur India.

Prof (Dr) Madhura A Yadav

Prof (Dr) Madhura A Yadav is an Architect Planner and has obtained her Doctoral degree from School of Planning and Architecture, New Delhi. Currently she is the Director at School of Architecture & Design at Manipal University Jaipur. With more than two decades of teaching and professional experience, she has published number of papers in national and international journals and conferences. Her current research interests are Architecture-Ecology interface and Eco-cities.

Ioana Gabriela Simion

Ioana Gabriela Simion is a 4th Year Architecture and Urban Planning student at Warsaw University of Technology, Poland. During summer holidays 2015 she was pursuing an internship organized by IEASTE on sustainability principles in heritage buildings under the guidance of Prof. (Dr.) Madhura Yadav, at School of Architecture & Design at Manipal University Jaipur. Her interests are sustainable architecture and city planning.

ABSTRACT

Heritage buildings are the finest examples of sustainable principles. Most of the heritage buildings used solar passive techniques as well as adoption of natural ventilation thus leading to thermal comfort. This paper focuses on the analysis of natural ventilationsystems in the Hawa Mahal, Jaipur- also known as Palace of Winds or Palace of the Breeze, due to its remarkable ability of air conditioning the whole area during the high temperatures in summers in the context of Jaipur’s hot dry climate.

The purpose of this study is to analyse the building envelope of this structure, the construction techniques, building materials and passive cooling techniques and how these affect the indoor microclimate, stabilizing the insidetemperatures and thus providing thermal comfort. The results of the measurements and observations confirm the climate responsiveness of the Hawa Mahal.

Through the building techniques used, vernacular architecture makes use of most of the identified climate responsive design strategies. It is designed to provide the most comfortable shelter with the building materials and technologies available at the time. The idea of climatically responsive design is to modulate the conditions such that they are always within the comfort zone, and this is something that has been achieved in vernacular architecture.

INTRODUCTION

In the context of a globally emerging energy crisis, as well as a shift towards sustainable architecture and renewable energies, we need to direct our attention to locally adapted solutions in heritage buildings and how we can adapt these techniques in contemporary architecture.

As A. Krishan insists, “architecture which is sensitive to site, sustainability, climate, the teachings of simplicity and beauty are to be learnt from the common sense lessons of the vernacular.”

2idem,p.9
MONSOON ARCHITECTURE FESTIVAL 2017

21, 22, April
Bolgatty Palace, Kochi

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Monsoon Architecture Festival is a celebration of architecture, art, craft and culture of the monsoon climatic regions of the world organized by the Indian Institute of Architects (IIA), Cochin Centre. It is the culmination milestone of the Living Monsoon program of the IIA Cochin Centre. The festival brings keynote speakers, architects and non-architects, who have done exemplary work in the monsoon regions of the world. The festival is planned to have multiple dimensions such as design talks, installations, workshops, exhibitions, arts, crafts and cultural expressions of this unique region.

For the first time, international MONSOON ARCHITECTURE AWARDS is being instituted as part of the Monsoon Architecture Festival. The aim of the awards is to bring recognition to recent best projects of the Monsoon Climatic Regions of the world. Projects are invited from Architects world-wide, who have done exemplary works in the Monsoon Climatic region, designs for which are sensitive to Climate, Environment and Society.

The Indian Institute of Architects hereby invite members of our national and international fraternity of Architects to participate in the Festival and submit your entries for the first ever Monsoon Architecture Awards. For more details, log on to www.livingmonsoon.com

Important dates to remember -

Last date for submission of entries for the Monsoon Architecture Awards is 10th March 2017

Early bird registration for delegates closes on April 1st 2017.
OBJECTIVES
1. Study and analyse the climate responsiveness of heritage buildings;
2. Analyse natural ventilation systems of Hawa Mahal;
3. Identify how these concepts can be used in contemporary buildings.

The focus is mainly on natural ventilation systems and wind patterns, as it is one of the most prominent features of Hawa Mahal.

METHODOLOGY OF STUDY
It was necessary to study the Walled City Jaipur (history, image of the city, emergence and development) in order to understand the background, the climate and the particularities it presents in order to be able to understand the context of the Hawa Mahal.

Research has been carried out by analyzing: secondary data from background reading and literature review (books, websites and articles mentioned in References section and footnotes); primary data, collected from Climate Consultant version 6.0 BETA and on-site observations (including sketches, temperature and humidity measurements using a hygrometre, wind pattern and wind direction observations, sun light study, irradiance measurements using a solarimetre).

Qualitative and quantitative methods are used for the analysis. Qualitative-wise it refers mostly to building orientation, ratio of openings to built form, ratio of courtyards to built form, ratio of height to built form, perimeter to area ratio, materials used and their thermo-physical properties and it is supported by the quantitative data (RH i.e. relative humidity measurements, temperature measurements, wind direction). The ratio formulas used can be found in Climate Responsive Architecture by A. Krishan, N.Baker, S.Yannas. Thermo-physical properties have been determined using Properties Tables and Charts (Properties of building materials, Appendix 1 –Table A5) available at Research Gate website.

Field measurements as method adopted for study of thermal behaviours of the building: for study of thermal and natural ventilation behaviour of the building the following parameters have been followed by fixing some sampling points:

- Room temperature (dry bulb and wet bulb temperature) at various sampling points and at specific times of the day (ground floor and 1st floor galleries; porticoes; courtyards) – 4th-6th September 3-5 PM; 11th September 11 AM- 3 PM
- Humidity (RH) at various sampling points (ground floor and 1st floor galleries; porticoes; courtyards) - 4th-6th September 3-5 PM; 11th September 11 AM- 3 PM
- Irradiance (M, E, min and max values) – sampling point in 2nd courtyard - 4th-6th September 3.35-4.35 PM, 11th September 11 AM- 3 PM
- Wind direction at various points (ground floor courtyards; ground floor, 1st and 2nd floor galleries; ground floorporticoes). – 4th-6th September, 11th September, at certain time intervals mentioned in the study.

4. UV index and pressure measurements taken from daily weather forecast, measured daily for the 4 dates mentioned above.

The relative humidity, temperature, irradiance measurements (average of irradiance M, radiant exposure on period of measurement E, minimum and maximum value of instantaneous irradiation) have been taken during 3 consecutive days (4th September, 5th September, 6th September) during the same time intervals and for the same exposure (60 minutes daily from 3.35 PM to 4.35 PM for irradiance measurements, 3 PM to 5 PM wet/dry bulb temperature).

Observations have been carried out for the 11th of September (11 AM – 3 PM), measuring irradiance values, RH and temperature (wet and dry bulb temperature), as well as observing wind patterns and directions.

CLIMATE OF THE SITE
Jaipur (approximately 390 metres above sea level) is situated in the state of Rajahstan and it has a semiarid climate under the Köppen climate classification. [1]

Fig. 1 Map showing location of Jaipur under Koppen climate classification available at - https://skepticalsquirrel.wordpress.com/tag/koppen-climate-classification/

Annual rainfall - 650 millimetres
Generally, the average monthly wind speed varies in between 3.0 to 10.0 kmph during the year. But in summer, there are dust storms, dust – raising winds prevailing and wind speed reaches up to 10 kmph.[2]

1 AjitTyagi, O.P.Singh, S.S.Singh, Surender Kumar -Climate of Jaipur, Meteorological Centre, India Meteorological Department (Ministry of Earth Sciences), p.9

2 114 www.indianinstituteofarchitects.com JOURNAL OF THE INDIAN INSTITUTE OF ARCHITECTS JAN-FEB 2017
ENTATION

The site on which the Walled City of Jaipur was built was developed as a mandala, containing 9 parts - or chowkris, and set on an orthogonal grid. The directions of each street and market are East to West and North to South, and oriented along a 15o axis [3], which is not observable on the ground, in order to provide shading and cut off sun at certain intervals and allow maximum ventilation.

Hawa Mahal was built in 1799 by Maharaja Sawai Pratap Singh and designed by Lal Chand Ustad.

The building orientation was a major design consideration, mainly with regard to wind, solar radiation and daylight. Hawa Mahal (coordinates 26.923611oN, 75.826667oE, altitude - 443 m) is located in the centre part of the 9-block mandala. Constructed of red and pink sandstone, the palace sits on the edge of the City Palace complex.

The main facade faces East, while the plan develops along 2 main courtyards, a number of 9 smaller courtyards being present at the ground floor level. [4] The amount of summer sun especially in the afternoon can be controlled through the openings of the porticos.

HAWA MAHAL - ARCHITECTURAL FEATURES AND INDOOR CONDITIONS

1. PLAN FORM[5]

The plan is built around two rectangular courtyards [a], both of different dimensions, connected through a series of porticos one to the other and to the other rooms [b]; at the North-East corner of the palace lies the tower [c], which is the highest structure of Hawa Mahal and it serves in the natural ventilation of the building, having openings...
positioned accordingly to the prevailing wind patterns; the highest number of openings occur on the North and West sides. The galleries (one of the galleries at the ground floor [d] and the main gallery at the 1st floor are oriented towards the East and have the maximum number of openings compared to the other rooms, according to prevailing wind patterns – Easterly wind blows every season, but especially in summer and winter).

**Orientation of Rooms**
The first courtyard is oriented South-North, with the porticos developing on the Eastern side. The second courtyard is oriented South-North, with porticoes on both West and East sides. The main galleries on ground and 1st floor are oriented towards East, while the smaller gallery on the ground floor faces North [e].

**Function of rooms and building elements**

- **ground floor:** galleries, hallways, 11 courtyards [6], porticoes [7]
- **1st floor** – verandas, terraces, chhatris, the main gallery [8]
- **2nd floor** – terraces, galleries, chattris
- **the tower** – stack ventilation effect; circulation purpose, access to various levels of the building, panoramic view from highest floor;

  - **the courtyards** – thermal buffers, ventilation mechanism through the exchange of air inside/outside; it also acts as a perfect shading technique, while also allowing light inside. The arcade along the courtyard keeps the interiors cool. A water sprinkler is placed in the second courtyard to cool and humidify the incoming air [9];

  Generally, the courtyards a very common passive solar device, and it is the main source of air exchange from inside the built space to the outer free space. The success of the cooling principle of courtyards depends on a combination of climate, building shape and wall materials perfectly applied in the case of Hawa Mahal.
ANALYSIS OF NATURAL VENTILATION SYSTEMS IN HERITAGE BUILDINGS

verandas—prevent the direct heat and glare of the sun from entering the house

○ Perimeter to area ratio
It is a very important factor in controlling the heat gain and loss, and should be kept to a minimum especially in hot climates, resulting in minimum heat gain.

\[
P/A \sim \frac{201}{(2090+343,17+260,97)} = \frac{201}{2694,14} = 0,074
\]

For the hot dry climate Hawa Mahal is set in, this number is kept at a minimum, thus ensuring minimum heat gain.

○ Ratio of courtyards to built form
There are 11 rectangular courtyards of different dimensions, with a total area of 1124,45sqm. The total area of the ground floor \( A = 2221,88sqm \), hence \( R=\text{Acourtyards} / \text{Abuilt form} = 0,5 \)

In other words, the built area is about twice the area of the courtyards, thus providing sufficient air circulation.

○ Openings
Openings play a main part in what regards the solar passive and the ventilation strategies. Main openings are in the form of courtyards and terraces whereas semi openings are in the form of porticos in Hawa Mahal. The two main courtyards divide the building longitudinally in three parts and transversely in two parts.

The openings of the main galleries on ground floor and 1st floor correspond to the openings on the main sandstone facade (East).

○ Thermal buffer areas— the verandas, the courtyards— enhance natural ventilation, especially cross flow ventilation where this is required.

2. BUILDING ENVELOPE
Building envelope components are the key determinants of the amount of heat gain or loss and wind that enters inside the building. The primary components of building envelope which affect the performance of the building are:

- Walls
- Fenestrations
- Roof

a. WALLS

- thickness
The thickness varies from about 60 cm to 100cm on ground floor for the load bearing walls to 40cm for non load bearing walls. The considerable thickness can be explained in the context of Jaipur’s hot dry climate, where it is necessary to have thermal mass in order to prevent heat gain during summer. Thermal mass can be incorporated into a building structure to absorb heat during the daytime hours. The key to the success of many naturally ventilated buildings appears to lie in the use of thermal mass. Typically this mass is incorporated into ceilings and walls in the form of concrete or brick. At night, cooler outside air is brought in to bring the temperature of the thermal mass back down to pre-occupancy levels. While the outdoor temperature may fluctuate by ten to fifteen degrees C, the interior of a building with a significant amount of exposed thermal mass may experience only temperature fluctuations of two to three degrees.4

- materials used
The load bearing walls are made of sandstone (specific mass – 2600 kg/m3; thermal conductivity – dry 1.6 W/mK, wet 1.6 W/mK) and rubble, rendered light yellow or red/pink. The columns, which are load bearing and support the arches that distribute the loads evenly, are made of marble (specific mass – 2700 kg/m3, thermal conductivity – dry 2.5 W/mK, wet 2.5 W/mK) or stone, especially on the 1st floor.

The specific heat capacity (i.e. the amount of heat per unit mass required to raise the temperature by one degree Celsius) of sandstone is 0.92 kJ/kgK. As compared to concrete, which is widely used in buildings today (specific heat capacity – 0.75 kJ/kgK), it can be observed that the value is higher, which means sandstone provides better thermal mass than concrete.

The use of these materials is easily explainable—firstly, they were readily available throughout the region making them a sustainable and viable choice, and secondly, they provide sufficient heat insulation through their thermal mass. Also, it can be noticed that both sandstone and marble present same thermal conductivity on both dry and wet conditions.

Fig. 9 the fountain helps humidify the air; photograph from personal archive, September 2015

The exterior finishings of the Hawa Mahal respond to the climatic challenges – the surface colours are light (light yellow and geru), and the texture of the sandstone used is rough, in order to provide greater reflectivity and re-radiation, which keeps heat gain to minimum.

b. FENESTRATION
The Hawa Mahal has 953 small Jharokhas (covered windows) which allow view towards the outside and enhance ventilation inside the building through their position and shape (jails are set at an angle maximizing wind flow according to Bernoulli-Venturi principle). The maximum small openings are given at the East facing side (176 small windows), where the galleries are located, to capture the prevailing wind all year round, but especially in summer when the prevalent wind pattern is East to South East. All the main rooms are oriented towards the North side with small openings but attached to verandas and courtyards through archways and porticoes.

Towards the West side, attached to the 2nd courtyard, there is a significant number of openings, corresponding vertically.

The fenestration configuration in Hawa Mahal respects the principles applicable in hot-dry climates i.e. windows need to be appropriately shaded, encourage air flow and natural ventilation, and they should have a small area. Also, the openings should be positioned at the upper part of the wall.

- thermo-physical properties of the building materials used
- thermal capacity, specific heat capacity, configuration (lattice work, painted glass, wood, size)

Windows are surrounded by stone lattice work and some of them have wooden shutters provided. The larger East facing openings of the galleries are of stone and painted glass.

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Specific heat for the lattice work, which is made of sandstone is 0.92 kJ/kgK, specific mass – 2600 kg/m³; thermal conductivity – dry 1.6 W/mK, wet 1.6 W/mK.

Wood – Specific heat 2 kJ/kgK
Glass – Specific heat 0.84 kJ/kgK

c. ROOF
- type/shape of roof
The roof is on most areas terrace roof (flat roof); the chhatris are covered with a curved sandstone roof

- materials used
The main covering is out of stone specific mass – 2600 kg/m³; thermal conductivity k – dry 1.6 W/mK, wet 1.6 W/mK. Again, as in the case of the walls, stone is used due to its thermal properties, as it insulates against heat.

The heat is absorbed through the roof and it is dissipated through radiative cooling (a form of passive cooling).

WIND PATTERNS
During the winter season, generally wind blows from East to North sector with speed 1 to 5 m/s. The maximum (15%) days it blows from Easterly direction.

Summer season is windy season for Jaipur. The average wind speed is 6-10 kmph. During the day time when Sun shines,
the intense heating causes convective movements and the wind speed increases. In the months of March and April the wind direction is East to South-easterly during morning hours and North-westerly in all the three months of season during evening hours. Also the wind speed increases from morning to evening.\textsuperscript{[11], [12]}

The surface wind speed decreases in monsoon season as compared to summer season. The decrease continues as the season progresses. The average wind speed is 7-8 Kmph. During most part of the season Northwesterly to West North-Westerly component of wind direction remain prominent while Easterly component remains about 5\% in all the months of the season. In morning and evening Westerly wind prevails. The frequency of calm wind is lowest in June and highest at the end of the season (September).

During post monsoon season, the average wind speed ranges between 2-4 kmph. The light winds blow during day time and become calm during night time. During morning hours wind direction remains Easterly while in evening become Northerly to Northwesterly.\textsuperscript{[13], [14]}

26th August - observation between 4 PM to 5PM - prevailing wind direction from West, afterwards switches from East \textsuperscript{[15]}

\textbf{VENTILATION

- ventilation principles to be observed at the Hawa Mahal}

The types of ventilation observed are: stack ventilation (the tower), cross ventilation (the galleries and most rooms) \textsuperscript{[16]}, \textsuperscript{[17]}, venturi effect (especially through the jails). The thermal mass captures the heat thus allowing for cold air currents

4th September – wind direction N and NNE, 10kph

5th September – wind direction WNW, 11 kph

\textsuperscript{[1]} Data collected from AjitTyagi, O.P.Singh, S.S.Singh, Surender Kumar -Climate of Jaipur, Meteorological Centre, India Meteorological Department (Ministry of Earth Sciences) and Climate Consultant version 6.0 BETA
TEMPERATURE AND RELATIVE HUMIDITY
Wet bulb and dry bulb temperatures have been measured using a hygrometre. In first instance, these parameters have been observed and analysed on 4th, 5th, 6th of September between 3 - 5 PM, at various sampling points (1st courtyard, 2nd courtyard, ground floor gallery)

On the 11th of September observation has been carried out during the day for 11 AM – 3 PM, at various sampling points (1st courtyard, 2nd courtyard, ground floor gallery and porticoes)\(^{18}\).

Several sampling points were taken at ground floor of the Hawa Mahal – temperature at sampling point - courtyard, temperature at sampling point – gallery, meteorological temperature. The RH(ratio of the actual amount of moisture in the air to the saturated amount) is calculated as well. The actual amount of moisture known as the mixing ratio is measured in grams of water per kilogram of dry air.

Drawing showing sampling points and the temperature difference in summer i.e.
\[ \Delta T = TM - TP, \text{ here } TM \text{ is metrological temperature and } TP = \text{ temperature of the point on same date}. \]

\[ T_{\text{outside}} = 36\,^\circ C, \text{ HUMIDITY - 34\% (1.25 PM)} \]
\[ T_{\text{outside}} = 38\,^\circ C, \text{ HUMIDITY - 30\% (1 PM)} \]

portoico – 1.25 PM: TDRY BULB = 35.5\,^\circ C (96F), TWET BULB = 24\,^\circ C (74F). RH = 34.9\% representing an actual mixing ratio of 12.7g/kg

courtyard – 12.35 PM: TDRY BULB = 35\,^\circ C (95F), TWET BULB = 22.5\,^\circ C (72F). RH = 33.2\% representing an actual mixing ratio of 11.7g/kg

gallery – 1PM: TDRY BULB = 31\,^\circ C (88F), TWET BULB = 24\,^\circ C (74F). RH = 51.5\% representing an actual mixing ratio of 14.7g/kg

\[ \Delta T_1 = 36 - 35.5 = 0.5 \]
\[ \Delta T_2 = 38 - 31 = 7 \]

It can be noticed that RH increases as moving towards the inside, as the air movement is not that accentuated as in the courtyard – the courtyard being a large, open space, it caters for air movement and air currents. Also, it has been noticed on site that as the courtyard gets crowded, the air humidity increases, as people block the air flow.

The mechanism of minimising heat gain can be observed from the temperature measurements from outside and inside the building (7\,^\circ C difference in temperature).

3. IRRADIANCE AND SUN LIGHT
- orientation of building
It helps in cutting off sun and provides shading through the orientation of the plan on an imaginary 150 axis. The openings towards East are small, with jalis, in order to control the amount of direct sunlight received.\(^{19}\)

The shade provided by canopies, porticos, arches, and enclosing walls offers thermal comfort in summer. As it has been previously mentioned, the courtyards act as thermal buffers.
CONCLUSION
As it has been stated in the introduction, there are certain lessons to be learned from heritage buildings. Studying the materials and techniques used, it can be said that the modern technologies should direct their attention to vernacular architecture and the climatic performances achieved by it.

ACKNOWLEDGEMENTS
We would like to thank all the officials at Manipal University Jaipur.

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‘Bio-mimicry ‘Zoomorphic’ as Inspiration in Architecture’

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ABSTRACT

The research aims to explore the Architectural design innovation by using the architecture of animals as a tool for modern designs. The inspiration from animals, insects, and birds is driving force in architecture, resulting in majestic works of architecture. This paper aims at revealing ‘How can design inspired from nature may help in architectural innovation, levels (behavior level, organism level), and principles. The paper also discusses various architects' works inspired by the architecture of animals. Bio-mimicry is used in every field like car designing, solar cell design, medical field for creating new drugs, furniture designing, fashion designing industry etc.

Keywords: Nature as a mentor, Animal Architecture, Bio-mimicry, Design that value nature, Natural Solution for every problem.

INTRODUCTION

Bio-mimicry from bios, meaning life, and mimesis, it studies nature's best ideas and then imitates these designs and processes to solve human problems. Ex. Studying a leaf to invent a better solar cell it is an "innovation inspired by nature." (behavior level), Studying the design of cocoon and using it as inspiration in woodtree house and cocoon tower. (organism level) Bio-mimicry is a science that studies nature's models and then emulates these forms, process, systems, and strategies to solve human problems. After many years of evolution, nature has learned what works and what lasts and using it as deign inspiration. It introduces an era based not on what we can extract from the natural world, but what we can learn from it.
The Eastgate Centre in Harare, Zimbabwe, is the best example of green architecture and ecologically sensitive adaptation. This largest office and shopping complex is an architectural marvel in its use of bio-mimicry principles. The design is inspired by huge wedges that are the nests of the Compass termites. The wedges are generally north-south oriented which gave these insects their unusual name. A single structure can accommodate up to three million termites. In northern Australia, huge fields of flat sided compass termite mounds can be seen. This group of termites lives in Africa, Australia, and South America.

The mid-rise building, designed by architect Mick Pearce in collaboration with Arup engineers, has no conventional air-conditioning or heating, yet stays regulated year round with dramatically less energy consumption. The building is...
designed with the unique ventilation system. Passive cooling and heating technique are used. The central open space takes the air from every floor to rise up through a duct located in the central spine.

Yellow Tree house restaurant, New Zealand was designed by Pacific Environments Architects. The entire construction was fairly simple, but the result is stunning.

The restaurant is shaped like a cocoon around the tree and, since the planks are not placed closely next to each other, it is filled with natural light and fresh air. At night the Yellow Treehouse restaurant, as well as the path, is illuminated by warm-colored lights that give it a romantic and natural shine that in no way reduces the value of nature around.

Architect describes the project as being ‘reminiscent of childhood dreams and playtime, fairy stories of enchantment and imagination’, and ‘the tree house we all dreamed of as children but could only do as an adult fantasy’. This tree house is definitely a breath of fresh air. It is carefully and successfully integrated into the landscape and provides full functionality of a restaurant that is enhanced by the unusual location and shape.

Cacoon Tower at Nishi-Shinjuku district in Shinjuku, Tokyo Japan was awarded the 2008 Skyscraper of the Year. Mode

Cacoon is also used as an inspiration for designing. By studying its form and using it as a design element. By analyzing its functional behavior i.e. to make a cover as a protective layer for space or taking shell structure as an inspiration and could help to design big span column-free structure.
Beijing National Stadium, Beijing China

Gakuen held a competition with condition that the building should not be rectangular and this project won out of 150. The winning proposal was a cocoon-like structure designed by Tange Associates.

According to Tange Associates, the building’s cocoon shape symbolizes a building that nurtures the students inside (as it is an institutional building). White aluminum and dark blue glass exterior form the structure’s curved shell, which is crisscrossed by a web of white diagonal lines earning it the name "Cocoon Tower".

Another good example of biomimicry is Beijing National Stadium, Beijing China. It was designed by the architect Herzog & De Meuron. The Bird’s Nest was designed to allow for the maximum amount of natural lighting.

In the pictures, one can see the amount of light that passes through the stadium, both through the walls and the roof. Originally the roof was designed to be retractable, but that idea was scrapped and saved “the cost of construction almost $200 million dollars”. [7]

Beijing’s National Aquatics Center, built for the 2008 Olympics, is another example of bio-mimicry known as “the Watercube,” the design derives its shape from the make-up of soap bubbles, which coincidentally strengthens its...
resistance to seismic activity. Each plastic "bubble" serves a higher purpose within the space, capturing air warmed by the sun and transferring its heat into the pool. Made of a highly durable plastic, the Water cubes surface is protected from the sun’s damaging effects, weather, and settling the dust.

Similarly the bubbles of a bubble raft, each facet is a lens connected to a long, thin, retinal cell beneath. The structures that are formed by clusters of biological cells often have forms governed by much the same rules as foams and bubble rafts, for example, just three cell walls meet at any vertex. The microscopic structure of the facets of a fly’s eye supplies one of the best examples.

A single layer or “raft” of bubbles contains mostly hexagonal bubbles, not all of them perfect hexagons. There are some “defects”—bubbles with perhaps five or seven sides. Nonetheless, all the junctions of bubble walls are threefold, intersecting at angles that are close to 120 degrees mixing, labor and wax."

Architecture firm BIG has unveiled a proposal for an apartment block in the Bahamas featuring a honeycomb facade where every balcony contains a swimming pool. It is an eight-storey residential building for a site on the south coast of New Providence Island, where it is set to become the tallest structure in the Albany community. [7].

The hexagons are balconies belonging to each of the apartments, having sunken pools facing directly onto the marina through clear glass. The honeycomb facade is given on the south face of the building. "A honeycomb facade functionally supports the pools making them sink into the terrace floor and provides spectacular sight lines while maintaining privacy for each residence," [7].
CONCLUSION
The relationship and connection between architecture and nature is one that has brought forth many issues, criticisms, and solutions. Today there is a new form of design that was introduced several years ago which requires modern man to look at the natural processes found in nature for inspiration. These processes have been around for decades but only recently has their true potential begun to emerge. We can take the philosophy behind natures living organisms and use them to aid in the development of mankind [4]. There is a need for future young Architects and designers to Create bio-inspired design adaptations that emulate nature’s best ideas, to get inspired by animals, insects, and birds and to implement it as the design of modern times. This brings a new way of thinking. Examples explained in this paper could act as a bridge in connecting design and architect via the environment.

A biomimic solution for architecture and designing could prove useful in following ways:
1. Energy efficient building
2. Sustainable Solution
3. Let the built environment grow with nature
4. Eco-friendly Solutions
5. This may prove economical.

REFERENCES
Re-Development of Karbighaiya Power Plant as Energy Park

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Ar Anup Bharti an architect graduated in 2016 from National institute of Technology, Patna, Bihar. His interest includes Architecture, Heritage conservation, astronomy, reading and travelling.

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ABSTRACT

The thesis project deals with the functional adaptation of an abandoned thermal power plant, located in the karbighaiya area of Patna, Bihar, India. The power plant ones cater the energy requirement of the city, but is decommissioned form service decades ago. The idea is to redevelop the site while retaining and enhancing the landmark character with a different purpose which will rejuvenate the dead local setup and will cater the recreational needs, especially for the nearby urban locality.

1. INTRODUCTION

The site is located in Bihar, India. The site was once the source of energy for the city. But, as the city grew it became difficult to operate the power plant within the urban fabric. So, it was decommissioned, but the colossal infrastructure remained on site and more than that, its silent but impressive presence became part of the urban fabric.

1.1 City Landmark

The whole site is a part of industrial heritage, but out of all the most striking and recognizable feature is the cooling tower, which stands out monumentally in that urban setup. It is the only structure that looks odd and adding its geometry with the monumental presence marks it as an urban Landmark. The cooling tower is hyperboloid in geometry. This odd curved character makes it striking in respect to adjacent structure.

1.2 Visual And Memorial Connectivity

The tower’s height is high with respect to the adjacent structure in the local fabric. The difference in height provides special visual connectivity from different places, which makes it recognizable from multiple corners. And its geometric character adds to the memory of the people. The oddness of geometry with height provides an impact on the memory of the people; this makes it as a point of attraction. The people from different age group connect themselves with different point of perception. Incidents and time in their respect. This kind of character is rare in cities as cities are subjected to regular change. But few tangible elements are there which shows the marks of time and are still intact in its very preliminary form. Some manmade structures showcase this tangible character and the cooling tower is one that showcases its monumentality and connectivity to the people in the karbighaiya area.
1.3 Role As Energy Park
Educating people and making them aware is the only way we can nurture our society and make it a better place for future generations. This is also a prime motive of an institution.

> Institutions Of Men Must Change Or Decay Grow Or Wither  
> - Anonymous

The concept is to redevelop the site as an energy park which will educate people by exhibiting and demonstrating the Renewable resources and technologies to convert resources into useful energy forms.

An analysis of the Mithapur area is done taking C.A.Perry walk able distance for neighborhood, a quarter a mile as a physical unit for the reach of nearby recreational facility. Below shown is the analysis of the Mithapur and Kankarbagh colony bounded within the physical and psychological barrier of transit routes.

2. DESIGN STRATEGY
2.1 Energy Representation
The site demonstrates five renewable energy forms and techniques. Conceptually the energy form demonstrated are centered along central retention pond which metaphorically represent the Cosmos and the sundial in it represent or energy source, the Sun in the Eternal Cosmos.

Functionally the site is arranged in three parts. First, the forecourt that comprises the parking and visitor’s orientation area. Second, the main body which comprises the exhibition and demonstration area and the Third and
REDEVELOPMENT OF KARBIGHAIYA POWERPLANT AS ENERGY PARK

Fig 2. Analysis of Green spaces with adjacent Kankarbagh colony

Fig 3. Site plan (Energy Park)
last part retains the cooling tower. The space between third zone and first zone also provides adequate head space from forecourt to perceive the cooling tower.

Itself within the site demonstration and exhibition spaces are arranged in left sided clockwise direction to complement natural flow, among demonstration techniques hydel system demonstrates the cross flow turbine for electricity generation through self sufficient water flow system.

On the other hand Solar energy is demonstrated by Building integrated photovoltaic’s, wind energy is demonstrated through VAWT (Vertical axis wind turbine) arranged at the end of artificial wind channel created on site to funnel prevailing wind, Biomass is demonstrated by biogas plant and geothermal energy production is demonstrated by binary system power plant which is the only installed system which does not produce any useful energy. But all techniques are easy to install in an urban area and are efficient for small installations.

2.2 Advancement Of The Landmark Character
The tower is retained and Architectural intervention is done in order to increase public participation to mark its position and presence even more strongly in people memory.

OPTION 1
A circumnavigation system around the cooling tower is attached, equipped with spherical passenger carrier. Visitor can perceive the dynamic city fabric throughout the mild circulation. In addition the partial southern supporting structure is covered with building integrated photovoltaic’s that will certainly interest everyone eyes.

OPTION 2
A ramped system is attached with a gradient of 8% having ramped walkway and alternate landing decks to see the anthropocentric development around the tower. The approach also inspires people to reach to the end, in order to perceive more, as if that happens in case of mountains, which inspire the climber to move towards the higher end.

OPTION 3
A vertical drop ride is installed inside the tower and the outside fabric is left as it is which may be used as city mural. That will catch the people eye like it did in the old days. The difference will be the changing canvas of the tower which will change with the time and the canvas can be utilized by the artists to present their art or to spread some message as it is open to the public eye.

CONCLUSION
Cities have entities which serve as Identity and Landmark, at the same time cities are subjected to rigorous change. In the consequence our cities lose some of its tangible entities which showcases itself as a representative of the gone era, these characters are exhibited in one of a kind structures made decades ago.

In this project, the cooling tower of the abandoned thermal power plant stands out as that kindstructure, pre existing in the site.

The cooling tower is retained on the site and is integrated in the design after analyzing its importance in the urban fabric. Further some proposals are presented in order to add a new character and connect it directly with people adding to its visual and memorial connectivity.

It’s very important to preserve and integrate such tangible elements with design to retain and propagate an identity of a place and people.

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The Maharashtra Convention, popularly known as MAHACON is an annual congregation of Architects organized by The Indian Institute of Architects. IIA-MAHACON is hosted by IIA-MAHARASHTRA CHAPTER and its Centre every year on behalf of the National body to bring together the professionals to discuss and deliberate the various facets of Architectural development, practice, education and the future vision. This year IIA celebrated its centenary year and IIA-MAHACON 2017 which had been hosted by IIA-Satara Center.

THEME OF MAHACON’17
Change is the only surety of life. We experience change within and around us right from our birth all through our life. Changes happen whether we want them or we don’t want them. Hence one may state ‘Change is Truth’.

Mankind has taken note of these changes since its existence on this planet. While doing so it had to adapt to these changes, sometimes accepting what cannot be changed and sometimes changing what can be changed.

Architecture has been a part of human development and we have been changing it all along our history of existence, till today. It is one of the manmade survival tools which humanity has used, to be with as well as against nature. We have changed it as our response to the various inner and outer changes recorded in our experiences.

In the ‘Modern’ Age or should one say ‘Digital’ Age, the surroundings are changing rapidly. These surroundings include both natural as well as manmade environment. Architecture which is a response to both natural as well as manmade environment has to take cognizance of all the changes. Although these changes are huge in number and cannot be easily listed, we can sense them always.

- FACING CHANGES IN TECHNOLOGY-
- FACING CHANGES IN LIFESTYLE
- FACING CHANGES IN AVAILABILITY OF RESOURCES
- FACING CHANGES IN ENVIRONMENT.
- FACING CHANGES IN EDUCATION
- FACING CHANGES IN RELATIONSHIP-

HIGHLIGHTS OF THE EVENT

Welcome speech was given by Ar.Mayur Gandhi, Chairman IIA Satara centre and Program outline of Mahacon’17 by Convenor, Ar.Yayati Tapale.
Publication of the souvenir - “Pravah” of the Mahacon ’17. was done on stage by keynote speaker Ar.Sudhir Jambhekar.

Our senior award winning members of IIA Satara Center of Satara i.e AR.Mahendra Chavan and AR.Shree Mahajani were felicitated at this occasion.

All the dignitaries of IIA NATIONAL & STATE COMMITTEE were felicitated at this event. Their presence and support graced this MAHACON’17.

Maharashtra Chapter Honorary Joint Secretary Ar.Sanjay Patil declared the Maharashtra Chapter honours, certificates and awards.

Publication of digital Maharashtra mobile app was done by the IIA President Ar.Divya Kush.

The first day session begun with a very renowned and honourable architect and the Keynote Speaker AR.SUDHIR JAMBHEKAR,NEW YORK.. followed with the presentations of our session speakers i.e AR.PRAVIN BAWADEKAR,BELGAUM,AR.LIJO JOS KERALA,AR.SHIMUL ZAVERI KADRI MUMBAI.
The second day session included the presentations by speakers AR. MUKUL ARORA NEW, DELHI, AR. RAFIQ AZAM BANGLADESH, AR. MUJIB AHMED & AR. LALITA THARANI MUMBAI.

Everyone was privileged to experience these very remarkable and noteworthy presentations of all these honourable architects with all of them with a very individual specialities, distinguished characters and there devotion into this architecture industry.

- Professionals and students from architecture and construction industry had participated in this event enormously.
- Exhibition stalls and displays also played a role in this convention.
- All our main sponsors of the event schneider electric, varmora tiles, bharati cement, nutec windows, silicon laminates, asian elevators gave away their presentations followed with their felicitation by all the respective guest speaker architects of mahacon,17.
- Cultural programme followed with gala dinner enhanced the evening of the event.
- The event concluded with the valedictory session. All the organising committee was honoured with the certificate of appreciation and momento by all the respected office bearers and executive committee of maharashtra state chapter.
DAY 1: 5TH JAN 2017
The IIAPL-Season 6 or The Centenary IIAPL, formally kicked off with the arrival of Team Maharashtra at the Gopinath Bordoloi International Airport at Guwahati on the morning hours of 5th of Jan. They were followed by other teams with Team Orissa missing the date and reaching on the 6th of Jan, 2017.

The evening was marked by the hosting of the Opening Ceremony at the "Nabin Chandra Bordoloi" Indoor Sports Arena, the venue for the National Games held in Assam, and was graced by Ar. Divya Kush, President IIA and many a Office Bearers of IIA. Minister of Agriculture, Govt. of Assam, Mr. Atul Bora also graced the occasion as the Chief Guest.

The Opening Ceremony started by singing of the State Anthem of Assam followed by the National Anthem. Then the Formal Announcement of the start of the event was done by lighting of the lamp by all the dignitaries present. This was followed by a March Past of all the participating IIA Chapters and Institute of Architects, Bangladesh. All together 13 IIA Chapters participated in the 4 day long sporting extravaganza of Architects, along with Institute of Architects, Bangladesh, who participated in the event as a Guest. All the teams were led by traditionally dressed ladies representing different Cultural Groups of Assam. A few traditional cultural programmers were also presented.

This was followed by the Captains Meeting were our Chairman, IIA Sports and Cultural Committee, Ar. Jitendra Mehta briefed all the Team Captains of the rules and regulations that will govern the 3 day Sporting Extravaganza. He also briefed the same to the Umpires also. Later the draws for the 4 new teams for the Cricket Tournament, The Table Tennis Tournament and the Badminton Tournaments was also done.

The Day ended with all the Participants leaving for the respective team hotels after Dinner at the same venue.

DAY 2: 6TH JAN 2017
The actual sporting events started on this day early morning with the start of the Centenary Run with was flagged of by none other than Mr. Shiva Thapa, Asian Games Gold Medalist and 2012 Olympic Games participant in Boxing from Assam. The even saw the participation of Ar. Divya Kush, President, IIA, Ar. Lalichand Zacharias, Jt. Secretary, IIA along with all participants of IIAPL-6. Ar. Sameer I.K (Kerala Chapter) and Ar. Geeta Balachandran (West Bengal Chapter) won the Centenary Run in the male and female category respectively. In the overall scenario, Ar. Sameer I.A., Ar. Upendra Patel and Ar. Geeta Balachandran came First, Second and Third respectively.

After the completion of the Centenary Run, the teams boarded their respective Team Buses and left for their respective grounds. All together 4 Cricket Grounds viz. Maligaon Railway Stadium, The Guwahati IIT Cricket Ground, IOL Cricket Ground Narengi and the Judge’s Filed were used for the Cricket Event. The 16 participating teams were divided into 4 groups of 4 teams each and each team playing two matches of 12 overs each. The best
team from each group advanced into the Semi-Finals either by virtue of better points or by better net run rate in case of similar points. On the first day, Telangana, Maharashtra 1, Madhya Pradesh, Rajasthan, Northern Chapter, Chattisgarh, Gujrat and Assam won their respective matches.

After the completion of the Cricket Matches, the evening session stated at the Nabin Chandra Bordoloi Indoor Sports Arena for the Badminton and Table Tennis Matches. Table Tennis was introduced as an event in the IIAPL for the first time here.

All together 29 Singles Players and 9 Teams participated in the Table Tennis Singles and Doubles Tournament. Ar. Vipul Salvankar (Maharashtra Chapter) won the Table Tennis Singles tournament defeating Ar. Chinmoy Phukan (Assam Chapter) to become the first Table Tennis Singles Champion. In the Doubles, IIA Maharashtra Chapter (Ar. Vipul Salvankar and Ar. Upendra Pandit) defeated IIA Rajasthan Chapter (Ar. Sharad Maithel and Ar. Abhishek Chandiliya) to become the first Table Tennis Doubles Champion. The Table Tennis Even was co-ordinated by Ar. Pritam Nath of IIA Assam Chapter.

Similarly, in the Badminton Tournament, altogether 19 teams participated in three different categories viz. Mens Doubles, Womens Singles and Mixed Doubles. Ar. Amshunath R and Ar. Ayyappan K A (IIA Kerela Chapter) defeated Ar. Aniket Khodwe and Ar. Rahul Patel (IIA Maharashtra Chapter) to become the Badminton Doubles Champion. In the Badminton Female Singles, Ar. Snehal Sontakke (IIA Madhya Pradesh Chapter) won against Ar. Kanchan Bambal (IIA Maharashtra Chapter) to become the Female Badminton Champion. In the Mixed Doubles Category, Ar. Aniket Khodwe and Ar. Kanchan Bambal (IIA Maharashtra Chapter) won against Ar. Prakash Sarode and Ar. Snehal Sontakke (IIA Madhya Pradesh Chapter) to lay claim to the Mixed Doubles Badminton trophy. The whole Badminton Event was co-ordinated by Ar. Pankaj Phukan of IIA Assam Chapter with Ar. Taskir Hussain associating him.

The Day ended with all teams reaching Hotel Lily for the Cocktail Dinner and then proceeding to their respective Team Hotels.

DAY 3: 7TH JAN 2017
The day began with all teams leaving for the respective team venues for the remaining portion of the league stage of the Cricket Tournament. On this day, Telangana, Maharashtra 1, Madhya Pradesh, Rajasthan, West Bengal, Kerela, Gujrat and Assam won their respective matches. This completed the league stage of the Tournament. Telangana and Maharashtra 1 advanced to the Semi-Finals by virtue of higher points in their respective groups. In the other two groups IIA Rajasthan Chapter and IIA Assam Chapter in one group and IIA Gujrat Chapter and IIA Madhya Pradesh Chapter got tied on points. IIA Rajasthan Chapter and IIA Gujrat Chapter advanced to the Semi-Finals by virtue of better net rate.

DAY 4: 8TH JAN 2017
The final day of the Sporting Extravaganza, started with the Cricket Semi-Finals simultaneously at Guwahati IIT Ground and the Maligaon Railway Stadium Ground. In the IIT Ground, IIA Gujrat Chapter took on IIA Maharashtra 1, where IIA Gujrat Chapter won and advanced to the Finals. At the Maligaon Railway Stadium Ground, IIA Rajasthan Chapter beat IIA Telangana Chapter to reach the Finals.

In the post lunch session, the Grand Final took place between IIA Gujrat Chapter and IIA Rajasthan Chapter at the Maligaon Railway Stadium Ground. The already two time Champion IIA Rajasthan, won the final mach to become Champions for the third consequent time.
The Cricket Event was co-ordinated by Ar. Chinmoy Phukan of IIA Assam Chapter in assistance of Ar. Taskir Hussain who managed all the Ground facilities.

The evening at the Green Wood Resort witnessed the Closing and the Prize Distribution Ceremony followed by a Grand Dinner. All the participants were treated to a Traditional Bihu program by none other than the famed Dhulia (Traditional Drummer) Mr. Ranjit Gogoi and his troops. The session and the event was brought to its culminating end by a Vote of Thanks by our IIAPL-6 Convenor, Ar. H.K. Rajkhowa.

IIAPL 2017 Diary has been compiled by Ar. Chinmoy Phukan, IIA Assam Chapter.
### IIA Assam Chapter

#### IIAPL - Season 6, The Centenary IIAPL, Event Cricket

**Man of the Match Awards**

<table>
<thead>
<tr>
<th>Match No</th>
<th>Teams</th>
<th>Winner</th>
<th>Man of the Match</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATCH 1 (IIT Ground)</td>
<td>Telangana V/S West Bengal</td>
<td>Telangana</td>
<td>Sajjan Kumar</td>
</tr>
<tr>
<td>MATCH 1 (Oil Ground)</td>
<td>Maharashtra 1 V/S Kerala</td>
<td>Maharashtra 1</td>
<td>Mirza Masood</td>
</tr>
<tr>
<td>MATCH 1 (Judges's Filed)</td>
<td>Madhya Pradesh V/S Tamil Nadu</td>
<td>Madhya Pradesh</td>
<td>Rahul Muniyal</td>
</tr>
<tr>
<td>MATCH 1 (Maligaon Rly Stadium)</td>
<td>Rajasthan V/S Maharashtra 2</td>
<td>Rajasthan</td>
<td>Ayush Bharadwaj</td>
</tr>
<tr>
<td>MATCH 2 (IIT Ground)</td>
<td>Northern Chapter V/S Bangladesh</td>
<td>Northern Chapter</td>
<td>Ankur Rohatgi</td>
</tr>
<tr>
<td>MATCH 2 (Oil Ground)</td>
<td>Chattisgarh V/S Orissa</td>
<td>Chattisgarh</td>
<td>Avinash Patra</td>
</tr>
<tr>
<td>MATCH 2 (Judge's Field)</td>
<td>Gujarat V/S Karnataka</td>
<td>Gujarat</td>
<td>Malay Shah</td>
</tr>
<tr>
<td>MATCH 2 (Maligaon Rly Stadium)</td>
<td>Assam V/S Presidents XI</td>
<td>Assam</td>
<td>Ankit Kashliwal</td>
</tr>
<tr>
<td>MATCH 3 (IIT Ground)</td>
<td>Telangana V/S Bangladesh</td>
<td>Telangana</td>
<td>Sandeep Naidu</td>
</tr>
<tr>
<td>MATCH 3 (Oil Ground)</td>
<td>Maharashtra 1 V/S Orissa</td>
<td>Maharashtra 1</td>
<td>Piyush Duggar</td>
</tr>
<tr>
<td>MATCH 3 (Judges Field)</td>
<td>Madhya Pradesh V/S Karnataka</td>
<td>Madhya Pradesh</td>
<td>Kapil Jain</td>
</tr>
<tr>
<td>MATCH 3 (Maligaon Rly Stadium)</td>
<td>Rajasthan V/S Presidents XI</td>
<td>Rajasthan</td>
<td>Sailesh Chandak</td>
</tr>
<tr>
<td>MATCH 4 (IIT Ground)</td>
<td>West Bengal V/S Northern Chapter</td>
<td>West Bengal</td>
<td>Abhisekh Dutta</td>
</tr>
<tr>
<td>MATCH 4 (Oil Ground)</td>
<td>Kerala V/S Chattisgarh</td>
<td>Kerala</td>
<td>Samith Purackandy</td>
</tr>
<tr>
<td>MATCH 4 (Judges Field)</td>
<td>Gujarat V/S Tamil Nadu</td>
<td>Gujarat</td>
<td>Chintan Shah</td>
</tr>
<tr>
<td>MATCH 4 (Maligaon Rly Stadium)</td>
<td>Assam V/S Maharashtra 2</td>
<td>Assam</td>
<td>Chinmoi Phukan</td>
</tr>
<tr>
<td>1ST SEMI FINAL (IIT Ground)</td>
<td>Maharashtra 1 V/S Gujarat</td>
<td>Maharashtra 1</td>
<td>Malay Shah</td>
</tr>
<tr>
<td>2ND SEMI FINAL (Maligaon Stadium)</td>
<td>Rajasthan V/S Telangana</td>
<td>Rajasthan</td>
<td>Ayush Bharadwaj</td>
</tr>
<tr>
<td>FINAL (Maligaon Rly Stadium)</td>
<td>Rajasthan V/S Gujarat</td>
<td>Rajasthan</td>
<td>Sailesh Chandak</td>
</tr>
</tbody>
</table>

#### Other Prizes

- **Fair Play Award:** Madhya Pradesh Chapter
- **Best Fielder of the Tournament:** Deepak Divakaran (Kerala Chapter)
- **Best Bowler of the Tournament:** Chintan Shah (Gujarat Chapter)
- **Best Batsman of the Tournament:** Sandeep Naidu (Telangana Chapter)
- **Highest Run Scorer of the Tournament:** Ayush Bharadwaj (Rajasthan Chapter)
- **Man of the Tournament:** Ayush Bharadwaj (Rajasthan Chapter)

#### Team Standings

<table>
<thead>
<tr>
<th>Winner No</th>
<th>Team / Chapter</th>
<th>Net Run Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winner 1</td>
<td>Rajasthan</td>
<td></td>
</tr>
<tr>
<td>Winner 2</td>
<td>Gujarat</td>
<td></td>
</tr>
<tr>
<td>Winner 3</td>
<td>Maharashtra 1</td>
<td>(+) 2.16</td>
</tr>
<tr>
<td>Winner 4</td>
<td>Telangana</td>
<td>(+) 2.07</td>
</tr>
<tr>
<td>Winner 5</td>
<td>Assam</td>
<td>(+) 3.73</td>
</tr>
<tr>
<td>Winner 6</td>
<td>Madhya Pradesh</td>
<td>(+) 1.41</td>
</tr>
<tr>
<td>Winner 7</td>
<td>Chattisgarh</td>
<td>(-) 0.09</td>
</tr>
<tr>
<td>Winner 8</td>
<td>Northern Chapter</td>
<td>(-) 0.27</td>
</tr>
<tr>
<td>Winner 9</td>
<td>Kerala</td>
<td>(-) 0.57</td>
</tr>
<tr>
<td>Winner 10</td>
<td>West Bengal</td>
<td>(-) 0.58</td>
</tr>
<tr>
<td>Winner 11</td>
<td>Karnataka</td>
<td>(-) 0.73</td>
</tr>
<tr>
<td>Winner 12</td>
<td>Bangladesh</td>
<td>(-) 2.77</td>
</tr>
<tr>
<td>Winner 13</td>
<td>Maharashtra 2</td>
<td>(-) 3.09</td>
</tr>
<tr>
<td>Winner 14</td>
<td>Tamil Nadu</td>
<td>(-) 3.25</td>
</tr>
<tr>
<td>Winner 15</td>
<td>Orissa</td>
<td>(-) 3.29</td>
</tr>
<tr>
<td>Winner 16</td>
<td>Presidents XI</td>
<td>(-) 4.53</td>
</tr>
</tbody>
</table>
Dear Fellow Architects

CONGRATULATIONS

After a prolonged legal process, the Hon Supreme Court of India has been pleased to pass a landmark judgement, clearly stating that;

“It is not correct to say that any one can practice as an architect even if he is not registered under the Architects Act. 1972”

A copy of this judgement is reproduced below.

Ar Divya Kush
President,
The Indian Institute of Architects

HEARTY CONGRATULATIONS

Dear Ar Amogh Gupta,

Jr Vice President - IIA,

Heartiest congratulations from all of us at The Indian Institute of Architects for being appointed to the prestigious position of the Chairman of School of Planning and Architecture, New Delhi.

We wish you a very meaningful tenure in this coveted position.

Ar Divya Kush
President,
The Indian Institute of Architects
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Title :
Address :
City : 
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Arch. CA No.
☐ Planner
☐ Engineer
☐ Builder
☐ Designer
☐ Educationist
☐ Administrator
☐ Business
☐ Other than above
(Please Specify)

CERTIFICATE
This is to certify that

____________________________
(Student’s Name)
is a bonafide student of

____________________________
(School, College of Arch.)

City _______________________

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(Please affix stamp of the Institution)
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STUDENT MEMBERSHIP FORM
YEARLY SUBSCRIPTION RS. 200/-

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YEAR OF JOINING ARCHITECTURAL STUDIES :

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NATIONALITY :

NAME OF PARENTS / GUARDIAN :

ADDRESS :

I have gone through the rules and regulations of The Indian Institute of Architects and shall abide by them.

__________________________
Signature of Student

SHRI / KUM. __________________________

is a bonafide student of our institution & He / She is ________________ class

The above information is correct to the best of my knowledge
(Proposed & Seconded by Members of I.I.A.)

__________________________
Signature of Head of Institute

1) 2)
Dear Friends,

It gives me immense pleasure and satisfaction to inform you that a long cherished desire of the members of the Institute of owing the IIA Head Office premises at Prospect Chambers Annexe, Fort, Mumbai of which we are the tenants for the last several decades has fructified.

Friends, we have finally entered into an agreement to purchase, with the Owners of the premises for a price of Rs. 1.25 crores. Applicable Stamp Duty and other fees amounting to Rs. 6.55 lakhs along with a token advance of Rs. 1 lakh has already been paid.

I congratulate all the members of the Institute for this achievement in the Centenary Year of I.I.A.

I also take liberty of appealing to all the Chapters/Centres/Sub-Centres and also individual members of the Institute to handsomely contribute to meet the requirement of the balance payment to be made to the Owners.

"Wishing you all the Best once again".

With warm regards,

Ar Divya Kush
President,
The Indian Institute of Architects
STREETS AS PLACES

Streets have a major part to play in infrastructure, sustainability and the quality of life in every city. Rapid urbanization during the Industrial Revolution led to the transformation of streets in Europe and America. These streets have again undergone a transformation to become “livable” by making them accessible and environmentally-friendly. Motorization has been reduced, and more space allocated to pedestrians, cyclists and the use of public transport.

Indian streets have had distinct characteristics which, though “informal”, traditionally made them more than physical networks. The “planned” roads”, on the other hand, fall short of leaving any lasting mark on urban minds.

BEHAVIOURAL STUDIES FOR DESIGNING ARCHITECTURE

Architecture and urban design create experiential spaces by evoking responses to the designed environment. The design of architecture involves not only responds to its context and function, but also in the prediction of the movements of the user. He is confronted by incoming sensory information inherent in the built design, thus making the experience inseparable from the built environment. Classical examples of such architecture are the beauty of the Taj Mahal, the impregnability of forts or awe-inspiring religious buildings.

Psychological research tells us that emotion is closely linked to cognition of our surroundings. This potential is actualized by affecting behavior in a positive manner. We have seen examples of this in the studies undertaken by Kevin Lynch and Jane Jacobs.

Architects, too, need to be sufficiently aware of these aspects in order to bring in the humanistic approach to contemporary situations.

ARCHITECTURE OF RUINS (FORTS, PALACES, MUSEUMS)

Historical buildings are generally described as single, fixed structures, as would be seen in a photograph. Such traditional approaches of study leave untold the contextual architectural traditions that have shaped the building. This part of the building’s history is often difficult to re-tell because of an absence of written sources.

Such buildings include palaces and forts of India, as well as those historical structures that are now being used as museums.

The architectural planning for these buildings has been informed by several factors such as site selection, use of local materials and construction methods, social and political factors, defence strategies, landscape, water supply, among others. Their spatial organization has also been a result of these factors, influenced to a great degree by the practical aspects of the traditional science of architecture.
Distinct from temple architecture, which served a non-temporal function, palaces, forts and museums have derived their personalities from their socio-political functions, local history and climatic factors.

**PARADOX IN ARCHITECTURE**

A paradox is a situation that seems difficult to comprehend because of the contradictions it contains. In architecture, the paradox is inherent in its very nature.

A building, on one hand, behaves like an aesthetic work of art; on the other, it also serves a function for which it was built. Both these, inevitably contribute to the experience of the built form. The challenge for the architect, then is, to effectively handle both these aspects and effectively design an environment which convey them successfully to the user.

Another paradox lies in the practice of architecture.

To become an architect, an individual undergoes intensive training. The design he conceives might be individualistic. Yet, it can never be built without a consortium of people who aid it- services, construction, engineering, etc. And eventually, his hold on his creation is relinquished when it is handed over to the users.

**DO CITIES HAVE GENDER?**

The relationship of an individual with the fabric of the city is played out in the experience. Inequality in the urban sense, deals with transformed opportunities in employment, education and income. These are further integrated with societal frameworks and spatial experiences.

Urban design and planning of cities can help diminish the dissimilarities in the various sections of society, as it does between the ways the genders use them, and feel the freedom to experience it. These are qualitative notions with regards to the urban environment, residences, streets, neighbourhood, parks and other, which engender a sense of belonging.

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e-Mail to: iiapublication@gmail.com

Photography by: Animish Thaker
A Space to Stimulate, Explore and Discover through Inquisitive Ambience: 
Offering a new Experience of Form

Ar Akanksha Wakhare

As a young budding architect, Ar Akanksha, a graduate of the renowned BKPS College of Architecture, Pune has always been fascinated about how space can affect its users and cater to their tertiary needs. Does "Form follow Feelings" remains the principal subject while experimenting through various design assignments she has conceptualised. Her portfolio seamlessly conveys that there is more to architecture than mere amalgamation of science and arts, which would be the inculcation of human psychology and emotions.

Winner of a host of prestigious awards at various levels during her academia, it is Design alone in all its elements, be it graphic, urban or architectural design, which has given her the strength to lucidly express "Design Intervention" in her paper being published. After interning with renowned architects (HCP Design, Planning and Management Pvt. Ltd., Ahmedabad and Sarvasva Designs Pvt. Ltd., Pune), she is currently working as a junior architect with a Pune based Design studio.

Development of individual and knowledge in a particular field, both require interactive experience with objects. (Science education in India today).

An Exploratory is a hands-on science centre – Self learning space, that introduces and attracts children and adults to science and technology; having places for demonstrations, interactive working models and place to explore plores (plores - a model, an experiment or anything to explore without the need to actually understand the principle at the given moment). It is not a museum nor a school but like a museum, and a valuable resource for schools. (http://www.exploratory.com/philosophy/index.htm)

Here the concept of learning is more suggestive than a complete topic and does not always focus on complete understanding of principles at the same instance.

A place which provides freedom of learning and a unique pedagogy to create interest in the minds of general public. It should be a place where there is greatest integration of art and science. A place of transformation and movement, a region of more diversity and more possibility.

Design Pointers

Various science galleries, museums, centres, laboratories and science festivals were studied to formulate a design program and guidelines for an apt built form to eliminate the lacunas. Interviews of experts were conducted for a better insight into the project.

• Such a place should be easily available for the public.
• A strong need for visual surprises.
• Planning should be such that it creates open spaces which are confined and have a character where various activities can take place.
• Transition should be a unique experience.
• Certain level of variety and complexity is required to keep a person engaged.
• Providing challenge adds element of fun and create an urge to try.
• The current buildings and spaces related to science do not excite the masses due to various reasons. One of the major reasons being, space does not facilitate exploration, the absence of amalgamation of indoor and outdoor spaces, lack of awe-inspiring spaces, dull ambiances most of the times, complicated exhibits, the location, the entire experience being tiring and less of learning. The places do not fascinate the masses.

Site and Sitting

Pune – has a glorious past, enviable present and a promising future. Pune has prospered continuously during last 600 years. The city has been selected as one of the smart cities for development. Smart development not only should include technological developments but development to make the citizens smart through various cultural and educational developments. Also known as the oxford of East. Thus a promising location for the spread of a new and innovative concept like an exploratory. South Pune has been
fast developing with lot of schools and a major university in the vicinity of the selected site along with the proximity of one of the major tourist attractions.

**Concept and Architectural Design**

Abstraction of scientific element— a wave- which along with its scientific significance is also very artistic in nature.

‘Learn through the building by experiencing the building, by playing with the building’. This can very well be done in the form of installations along with other ways like changing intensities of light, coloured lights, various textures and scales, varying gradients of ramps, easy to climb trees etc.

Facilitating Sensory activities through design : Learn with all the senses -

Exploration and learning should happen with all 5 senses, which will naturally encourage visitors to use various parts, while they play, create, investigate and explore. Spending time stimulating their senses helps visitors, specially, children to develop cognitively, linguistically, socially and emotionally, physically and creatively.Observing surroundings and grasping, varying visual texture, hearing lectures or instructions, touching various textures and tactile surfaces, smelling various fragrances of vegetation, tasting various flavours etc.

The program along with architecture design thus promotes such learning.

**Urban Considerations**

Leisure public activities currently take place at this node. The traffic movement here is light. Too much crowding is being seen.

A potential public insert to relieve the current cluttering and create a better place for the neighbourhood to gather, for short periods along with helping in creating awareness about the exploratory in common masses.

The space requirements have been decided on the basis of activities the campus will cater to. Major science festivals, conventions, science days, shows, exhibitions

Fig. 1: Analysis of an important node abutting the site
Landmark zone: Corner of the plot is a crucial in terms of place making. Thus the planetarium and observation tower is located here.

Activity zone: The major hands-on experimentation and the public zone of the campus is divided in to 2 sections according to the requirements.

Welcome zone: Entrance from secondary road Administration, waiting, ticketing happens here.


Heart of the campus: The common open area to all the spaces is the most active space and major spine for circulation.

Public insert: The other corner of the plot is a potential public insert. A public plaza would enhance the activities and create awareness about the centre.

Academic zone: Laboratories and workshops have been given a secondary entry from a tertiary road.

Anna Bhau Sathe Auditorium

Courts: The existing trees have been preserved and spaces converted into courts in the built form.

Spine: The main circulation spine of the campus with 4 focus points - the arrival plaza, the entry plaza, Exhibition space which finally culminates into Amphitheatre.

In asymmetric planning, circulation is more free, the more fluid circulation, the more points of view and interest etc. will happen here. The visitors will be exposed to discovery halls where there is actual interaction with various setups in a fun way, resource centre where one can gather information about science and technology, hall of fame, idea and innovation hub where one can explore and experiment on their own. Along with it, the floating population can also access the library, outdoor science park, various demos, planetarium and observation tower. The Academic zone where students who have further interests, can join the courses ancillary to school education. Fun spaces like the tree maze, outdoor areas and do-it-yourself canteen helping in understanding various sciences.

In asymmetric planning, circulation is more free, the more fluid circulation, the more points of view and interest...
generation and exploration. The crowd is permitted to filter freely through the entire complex with powerful focal centres at required locations.

There are receding tiers and each tier has plants - for protective along with an aesthetic role. Provision of green roofs also add to extra space in the campus required for specific days. The plants (only native species are proposed) keep the environment clean and reduces carbon dioxide emissions, helps in reduction of noise.

A busy road abuts the flat site, with a lot of retainable vegetation. The cluster of trees on site have been retained by puncturing the masses at those points. These form the pause points and outdoor areas of the spaces. The built form, share a common language that turn them into a cohesive composition, yet not similar to each other. All the elements on this flat site, thus attain sculptural quality. Monotony of the site has been relieved by the boldness of the structure.

Characteristics of spaces influence the attention of visitors and hence the circulation pattern. Asymmetrical planning, newness at every step, unpredictable ambience, meandering circulation, simple circulation and way finding is achieved. A curve keeps the continuity intact, in spite of openings. Spatial continuity evokes dynamism. It is difficult for man to concentrate for long periods of time which leads to shift of activity. Hence providing of resting spaces at intervals in a museum-like space is helpful to re-concentrate. These break points are located as such that one can reach, considering his individual concentration span.
The spaces can be experienced in sections along with the plans. The monotony is broken with the help of levels. Integrating nature with the activity space, making it more lively and fresh also helping in transition of moods. Creating various levels to experience a variety in viewing angles and perception of things.

Elevations are dynamic and portray the amalgamation of science and art. Here the form hints at what one is going to experience inside. It caters to the surprise element of the space. The structure does not reveal much about its use, generating curiosity in the minds. Its uniqueness helps attract more people helping in the creating the centre’s awareness.

There is an evocative play of spaces, form, surfaces and interplay of light and shadows, helping achieve design goals.

ACKNOWLEDGEMENTS
I sincerely thank my graduation school B.K.P.S. College of Architecture, Pune, Savitribai Phule Pune University; Principal Prof. Pushkar Kanvinde, and my Thesis Guide, Prof. Vibha Nakhare, (request to re-check the salutations of principal as well as your thesis guide) for extending their utmost support and to the Editorial Board of the Indian Institute of Architects for extending to me this opportunity to publish my paper.
The thesis attempts to design an institute for journalism and mass communication. The site is a 50 Acres of land, at Bhopal for setting up the institute. It is approachable by 18m wide road with a Longitudinal shape on the broader side towards the north. The functional requirements of the Institute can be divided broadly into four categories; Academic, Administration, Residential, Recreational. Considering Academic area to require maximum area, it was placed on the broader Side and residential on the shorter side. All the activities lie along the axis which was created to Connect the two areas. The hostels are provided near the academic area with recreational area in between.

Primary axis (Campus Street) and secondary axis have been provided for functional connectivity and linkage of the inter-relationship module. Primary Axis connects common facilities with academic and residential areas. One of the secondary Axis leads to common facilities from main entry whiles other one to residential area from residential entry.

The key features of the site planning besides creation of axis are- 
1. Separation of vehicular and pedestrian & cycle movement- expects this campus to be cycle driven.
2. Symphony of courts- The site is the bigger court, the academic court and the court inside the various academic blocks.
3. Interactive spaces, Future Expansion, Handicap Friendly
4. Creation of Micro Climate

With two entries provided, the main entry comes across the administration block and the auditorium. The core reason was to have maximum visitors visit these places right at the front of the 4th pillar of democracy.

4th Pillar of Democracy

Journalism is called the 4th pillar of democracy. So to give the whole campus an identity, the 4th pillar was designed and placed at the heart of the site.
The pillar represents the profession of journalism in a very apt manner. It stands TALL, BOLD, STRAIGHT and STEADY. The punctures through the pillar represent the key quality of the professional of this trade- to look on the other side of the wall. The black stone base represents the practicality and shows the down to earth attitude. The Engraved historical clippings of news paper on the pillar represents the role of journalists in Presenting the events and happenings of their times.

**Campus Street- the key to Campus Life**

The campus street is the heart of activities of the whole campus. It is a two level open corridor which runs longitudinally in the middle of the campus and forms the activity corridor. It runs from the academic area to the residential court connecting all the areas and also helps the users to negotiate various climatic conditions. A green belt and cycle path runs along the campus street. Various accesses have been provided along the campus street to connect the two levels.

The campus street acts as an axis for division of various activities as well as provides visual and physical connectivity to all major activities within the campus. It in itself becomes the hub of activities. The bridge at the first level ends at the shopping complex. The shopping complex acts as an interaction and relaxation hub for the students. The campus street further goes till the residential complex with director’s residence and guest house on the left, girl’s hostel at the right and faculty housing at the terminal point.

The campus street from the academic area connects the entire academic block on ground level as well as the first level and gives a feeling of oneness to the area. The walkway on the ground level gives direct access to the main entry of each building.

**Academic Block**

The academic block can be approached both at ground level and at first level thru the pedestrian walkway and the bridge. A double height entrance foyer and a double height entrance lobby have been provided to give a feeling of openness. As one enters the lobby he is visually connected to the landscaped court and also gets a view of the first floor. Broad corridors have been provided to access the class rooms and appropriate numbers of toilets have been provided. The interactive court and the landscaped courts connect various departments visually. The entry in the middle has been provided with lifts and ramps so as to make the campus accessible for all.

The lecture theatre complex has been provided at the terminal point of two academic blocks. It can be approached by students from academic blocks as well as from ground and first floor level.
Cycle parking has been provided under the raised part of lecture halls on ground floor. Services can also be placed alongside.

The green court between the lecture halls and the academic blocks acts like a buffer and spill over area.

The elevation is simple, elegant and bold. The function dominates the form. Each element has been provided for functional reasons. Vertical louvers in east and west and horizontal louvers in south have been provided. Ample fenestrations have been provided to connect inside to outside visually and the green belt between the bridge and the building helps in creating a micro climate.

The long bridge on the first level not only provides a character but also provides an access and a place for interaction combined with an interesting view of the central court. The treatment of fenestrations, providing features like cross ventilation, central court and peripheral green not only makes it environment friendly but also saves on a lot of energy.
only makes the place lively but also provides an opportunity for interaction. A green patch between the blocks gives each room a view to the landscape.

Each hostel block is a complete entity in itself. Each room is accessed by a singly loaded corridor. The corridor moves around the central landscaped court. The second floor has an interaction terrace which overlooks the court on one side and the outer landscape on the other. The centrally provided staircase acts as a spine. The ground floor also has a waiting room for the visitors. Each hostel block provides ample privacy to the users and also ample interaction opportunities. The visual connectivity is yet another feature of the design. Dining block has a dining hall, a well equipped pantry and service area. The first floor houses the common room - big enough for multiple activities or a big party. The key feature is a wide staircase which leads to the first floor from the hostel plaza. The steps will be of red sand stone where the students will engrave their names as they leave the institute. The big terrace makes it a hub of social interaction.

All the academic blocks are also approachable from the rear side if someone is coming from the hostel on foot or by cycle. Conveniently located cycle parking has also been provided on the outer periphery of the academic blocks.

**Hostels – Home away from home**

Hostel is one of the important areas of any campus. It is a home away from home. It’s a place where students spent a majority of their time. Social interaction is an important aspect of hostel design.

Interaction at community level has been provided by creating a hostel plaza. It can be accessed from all sides and by foot or by cycle. Inside every hostel block is a central court which not
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