# Understanding the Evolution in the architectural language of Ar. Shivdatt Sharma

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Submitted By

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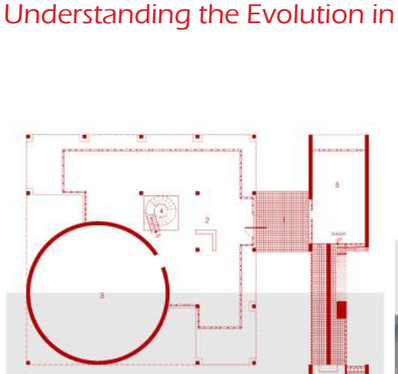

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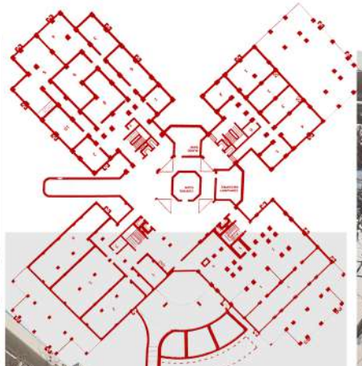

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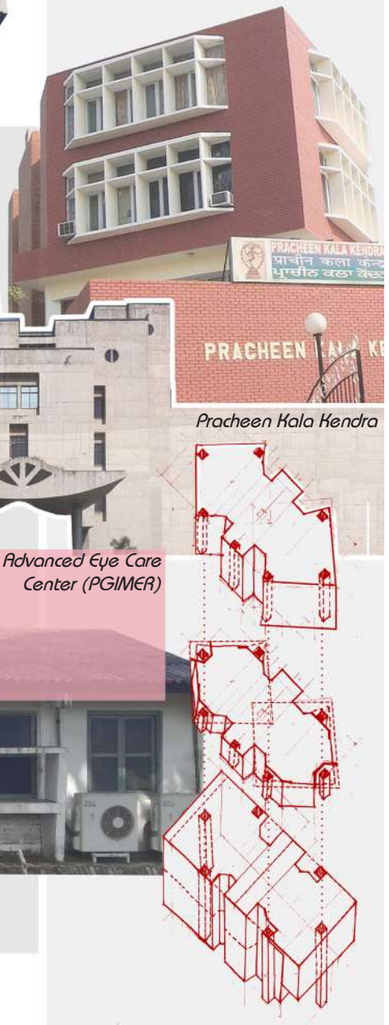


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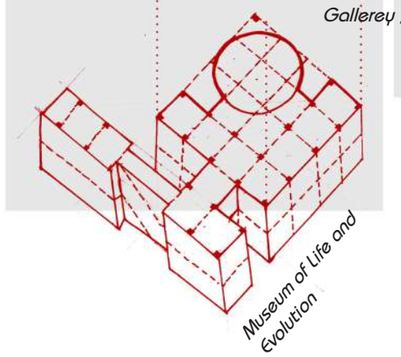

Museum of Life and
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## Approval

The following study is hereby approved as a creditable work on the subject carried out and presented in the manner, sufficiently satisfactory to warrant its acceptance as a pre-requisite towards the degree of Bachelor of Architecture for which it has been submitted.

It is to be understood that by this approval, the undersigned does not endorse or approve the statements made, opinions expressed or conclusion drawn therein, but approves the study only for the purpose for which it has been submitted and satisfies him/her to the requirements laid down in the academic program.

**Thesis Title:** Understanding the Evolution in the architectural language of Ar. Shivdatt Sharma

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## Declaration

I, **Nitya Bhargava, 19BAR020**, give an undertaking that this research thesis entitled "**Understanding the evolution of the architectural language of Ar. Shivdatt Sharma**" submitted by me, towards partial fulfilment for the Degree of Bachelor of Architecture at Institute of Architecture and Planning, Nirma University, Ahmedabad, contains no material that has been submitted or awarded for any degree or diploma in any university/ school/institution to the best of my knowledge.

It is a primary work carried out by me and I give assurance that no attempt of plagiarism has been made. It contains no material that is previously published or written, except where reference has been made. I understand that in the event of any similarity found subsequently with any published work or any dissertation work elsewhere; I would be responsible.

This research thesis includes findings based on literature review, study of existing scientific papers, other research works, expert interviews, documentation, surveys, discussions and my own interpretations.

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# Achnowledgment

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I am deeply indebted to Ar. Shivdutt Sharma for his cooperation and patience during our interviews. Your warm welcome, the literature you provided, and your insights enriched my research tremendously. Interacting with you has significantly enhanced the quality of my thesis. I would like to thank him for answering all my questions and for contributing your time and knowledge so generously. It was an honor to meet and learn from a legend in the field, and I am profoundly grateful for the opportunity

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# Contents

# Introduction

India gained its independence on 15th August of 1947, and with this independence, also came the partition of the nation into India and Pakistan. There was an urgent need to address the refugee crisis and build the necessary infrastructure to accommodate the needs of the growing nation.
During this time, views diverge on the future architecture of India and the identity it would have. One school of thought advocated the glorification of India's vast and ancient past, known as the **Revivalist** movement. It aimed to evoke a sense of pride and nationalism in the citizen pre-independence. Post-independence, revivalism was a way of reclaiming one's nationality and giving India a unique identity on the global stage.
The other school of thought emphasized on the importance of moving beyond the past and focusing on the future. They argued that the architecture of the country should reflect its contemporary needs, technological advancement and its aspiration as a developing nation.
It is during this time, that we see the emergence of the **'International style'** or **Modernist** architecture in India.

To accommodate for the loss of Lahore, which was a part of Pakistan after partition, India seeked for a new capital for Punjab, which would be the symbol of the newly independent and progressive state of India. This city was to be called **Chandigarh.**
The first Prime minister of India– Pandit Jawaharlal Nehru, believed that India's architecture should reflect its new identity. He envisioned cities that embodied **democracy, secularism, equality** and a focus on **science** and **technology**. In the context of the debate between the modernism and the revivalism, Chandigarh designed by **Le Corbusier** was a turning point in the emergence of Modern architecture in India. Le Corbusier's Modernism found great patronage in Pandit Jawaharlal Nehru, as it fit perfectly with his vision.
Master architect Le Corbusier, along with his other associates –Pierre Jeanneret, Maxwell Fry and Jane Drew, were appointed for the planning of Chandigarh, the new capital of Punjab. A team of Indian architects worked under them and contributed to the Chandigarh Capitol project. Their work in Chandigarh can be considered the architecture of the **Nehru Years** (late 1950s and 1960s).
Parallel to Chandigarh, master architect **Louis I. Kahn** is commisioned to design the Indian Institute of Manangement, in Ahmedabad by the industrial elite of the city.
The study discusses the influence of master architects like Le Corbusier and Louis I. Kahn, among other foreign architects on the architecture of India.

These Indian architects, who worked under the guidance of the masters, their contribution to nation building and then their subsequent architectural practice is an integral part of the narrative of the Modern Indian architecture. Exploring their architectural journey can reveal how they adapted the Modernism of foreign architects to the Indian context and its changing times, to create their own architectural language.
This study focuses on the works and ideologies of Ar. Shivdatt Sharma, who was a part of this team of Indian architects at Chandigarh. The study looks at the evolution of his architectural language, in his career spanning over five decades (1963 - present).
The existing literature talks about the works of Shivdatt Sharma, but there is a lack of comprehensive analysis that examines the evolution of his design principles or architectural language. The literature categorizes his career into 3 phases: *his time at the Department of Architecture in Chandigarh, his tenure as the Chief architect at the Department of Space (ISRO) at Bangalore and his private practice*. However, this study take a different approach by attempting to derive design phases of Sharma's career, offering a fresh perspective to his architectural journey.
Secondary case studies are identified and analyzed based on existing literature, site visits and interviews. Shivdatt Sharma's career is categorized into three phases based on the literature review and the secondary case studies – *The Early Phase, The Synthesis of the Influence, and Towards a New Language*. Through this categorization, the study attempts to see the transformation in the architectural language of Ar. Shivdatt Sharma and how did he innovate beyond the 'Chandigarh style of architecture'.
Parameters for a comparative study, derived from the secondary case studies are; **Materials, Form, Structure, Architectural Elements** and **Intent** of the Architect. The evolution of each parameter is explored through various projects spanning Sharma's career, employing a narrative approach.

***Keywords:*** *Post-independence architecture, Modernist architecture, Chandigarh, Evolution, Architectural language*

## Research Questions

1. How did the architectural scenario in India evolve, leading to the emergence of the ‘International style’ of architecture?
2. What were the key design principles employed in the making of Chandigarh and its influence on Indian architecture?
3. What were the influences on the architectural language of Ar. Shivdatt Sharma and how does it evolve?

## Aim

To explore the evolution in the architectural journey of Ar. Shivdatt Sharma and his contribution to Indian architecture

## Objectives

1. To trace the early life and background of Shivdatt Sharma.
2. To examine the early influence on the works and ideology of Ar. Shivdatt Sharma through architectural elements.
3. To analyse the distinctive language of Shivdatt Sharma through specific architectural elements, material, form, innovative approaches, contextual adaptations and regional variations.

## Scope and Limitations

1. Examining the evolution of the architectural language of Ar. Shivdatt Sharma, as the availability of drawings and images of his projects spanning his career enables to study the evolution.
2. The study primarily relies on secondary sources of data, such as literature, interviews, and existing documentation.
3. The study does not cover Shivdatt Sharma’s urban planning or mass housing projects.
4. The study does not encompass the entirety of Sharma’s career, potentially overlooking the lesser known and un-documented projects.

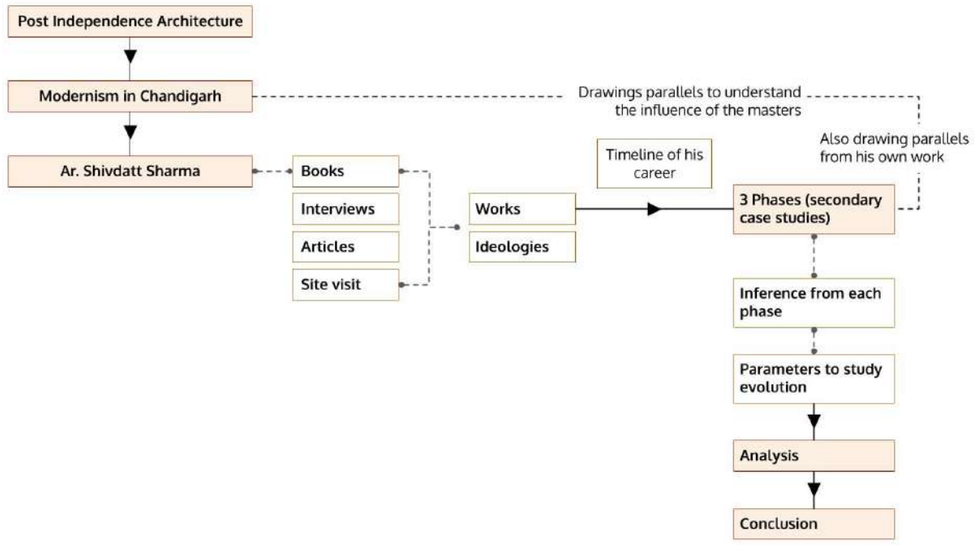


## Methodology

The study begins with a comprehensive literature review on post-independence architecture in India during the 1940s -1960s. This is followed by the understanding of the notable contribution of Le Corbusier and other foreign architects to Indian architecture and their significant influence on Indian architects, placing Ar. Shivdatt Sharma in this context.

Literature review on the architectural language of Le Corbusier and Pierre Jeanneret in India, to draw parallels and understand their influence on Ar. Shivdatt Sharma’s work.
Reading the relevant existing literature on Ar. Shivdatt Sharma and conducting interviews, to understand his early life and education, influences on his architectural ideology and design decisions.
Through the literature review, a timeline is prepared and Sharma’s career is categorized into 3 phases. Secondary case studies are selected to analyze these phases. Inferences are drawn from each of these phases.
Parameters to study evolution are drawn from these inferences.

**A narrative approach is taken for the analysis, since evolution could not be studied through singular projects, hence it is done by looking at the span of his work, with multiple secondary case studies. The narration is supported by images, drawings, diagrams and 3D visuals.**



Chapter 1

# Post-Independence architecture in the 1950s

India gained its independence on 15th August of 1947, and Pandit Jawaharlal Nehru became the first Prime Minister of the free nation. With the independence, also came the partition of the nation into India and Pakistan. There was an urgent need to address the urgent refugee crisis and of infrastructure to accommodate the needs of the growing nation.

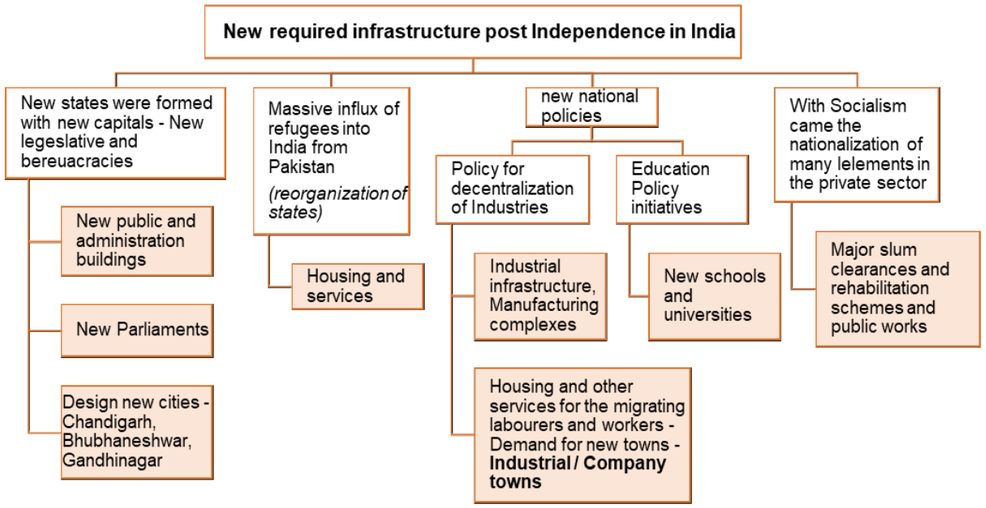



Fig. 1.1: Flowchart illustrating the new required typologies for the independent nations
*Source: by the author*

With the departure of the British from India, the nation looked forward to shaping its own destiny after years of colonial rule. With the nationalist spirit at all-time high, the country faced a fundamental question - *what did it mean to be Indian, and* how do we express this to the rest of the world? What would be our new identity?

In the 1950s, there was a search for identity for the newly independent nation, and in this search, an important question that rose was - How much **indigenization** (Chatterjee, 1985) could a newly independent nation afford without appearing backward to the its own country-men and the image it presented to the rest of the world, but also not completely forgetting the roots of the nation and adapting to '**foreign**' styles, which meant that we had not been completely de-colonized yet?

These two aspects of the question resulted in broadly two schools of thought- Revivalism and Modernism.



## 1.1 Revivalism

**The revivalist style took inspiration from the past.**

Pre –independence, the revivalist approach came from the need of **conserving** ones culture from being erased by foreign colonizers and post-independence the approach came from the need of **restoring** one's culture and leaving behind the British-style or the 'international' –style. Revivalist trends in India began as a defense mechanism from the time of the earliest British influence in India.

Nationalism, which was a widespread sentiment post-independence was largely expressed as Revivalism. It was a style that sought architecture that would be expressive of the 'new' India, but it did so through the **means of the past.** This past was often taken from the monuments, since they were the best surviving examples of the past.

Revivalism in India had many approaches, but the most prominent one was revivalism throught façade and symbolism. It was a superficial adaptation of the details of the past like chajjas , chatris, domes, arches, gateway and ornamentation in form of symbolism.

**Examples of building with revivalist expression post-independence –**

- The Vigyan Bhavan, New Delhi (1955) designed by R. I. Geholote of the CPWD
- Vidhana Soudha, Bangalore, designed by the CPWD of Mysore
- The Ashoka Hotel (1955-56), New Delhi designed by B.E. Doctor

Fig. 1.2: The entranceat the Vigyan Bhavan, New Delhi resembles the entrance of a Buddhist cave

Fig. 1.3: Vidhana Soudha, Bangalore

Fig. 1.4: The Ashoka Hotel uses jharokas and chajjas for ornamentation

## 1.3 Modernism

The terms *westernization* and *modernization* are often used synonymously. The ‘west’ is considered a monolithic, homogenous singular entity, usually associated with the ills of UK and USA now-a-days. *Westernization* today is often seen as Americanization.

Therefore, Modernization or Modernism was often perceived as a foreign identity or a concept borrowed from the West, leading some to view it as anti-national, as it came from the ‘colonizers’.

But it is essential to differentiate between the two. Modernism is simply the state of being up-to-date. The use of the term here implies changes from the past. Modernism is an attitude. It is based on the perception that change away from the past is required in order to make the future better.

While Revivalism led to an architecture which was clearly Indian in appearance, Modem architecture was seen by some architects as the architecture of democracy. (Lang, Desai, Desai, 1998)

**Modernism or the International style** was seen as a culturally neutral style of expression, and hence a suitable expression for the newly independent, democratic and secular India.

Chapter 2

# Modernism in India

**This chapter is crucial to the thesis, as it proives a context to Ar. Shivdatt Sharma and his work. The chapters helps in understanding the other prevelant practices and his contempories during the post-independence era.**

The poster on the right (Fig. 2.1) further illustrates these scenarios, and helps to contextualize Ar. Shivdatt Sharma, and the masters he followed.

The emergence of Modernism or the International style in India can be categorized in the following groups, following a timeline –

1. Originating from Art Deco and Indo Deco
2. The International Architects
3. Bauhuas in India: First group of foreign trained Indian architects in the 1940s'
4. Corbusier and Kahn in India – Architectural expression of the Modern India
5. During and after Chandigarh
6. The Effect of Chandigarh - Disciples of Corbusier and Jeanneret
7. The second group of foreign trained Indian architects

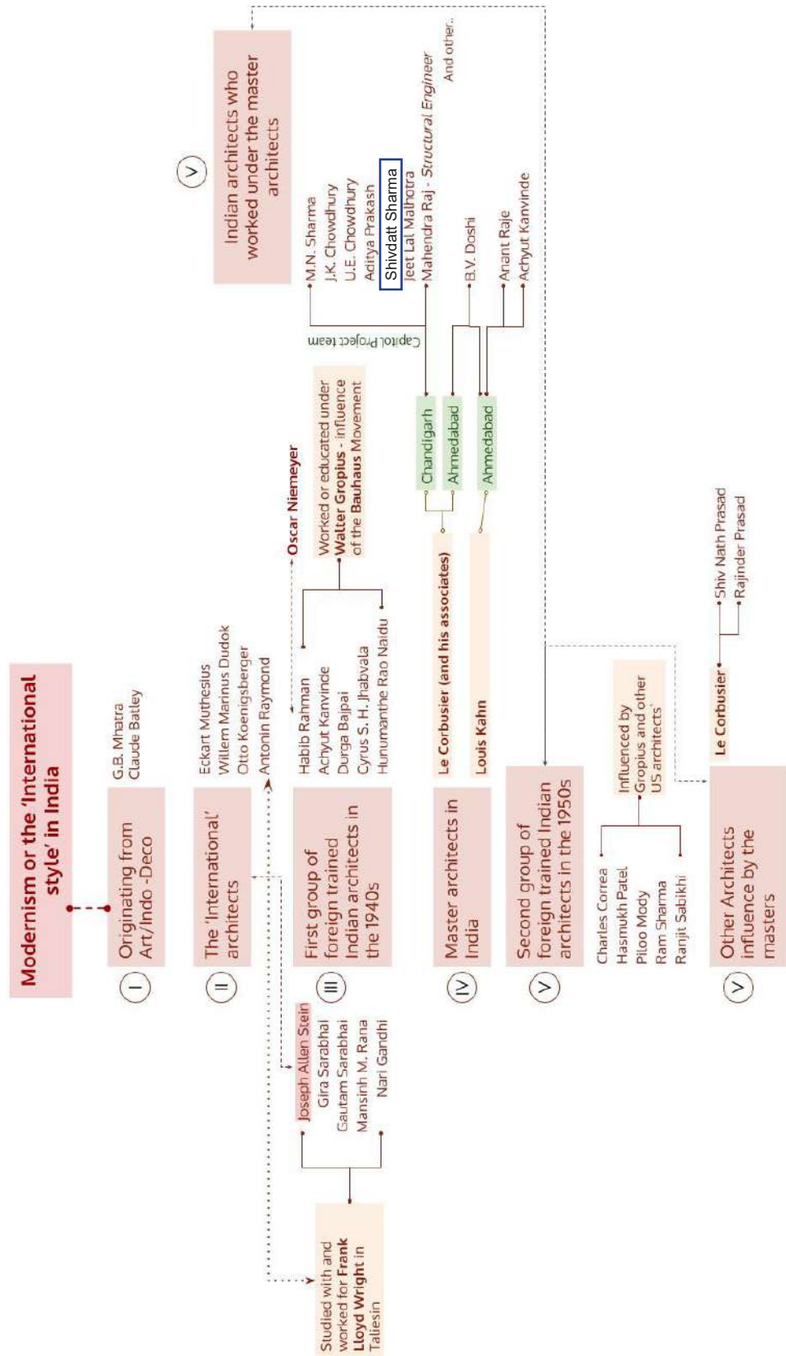



Fig 2.1: Diagram showing various architects working in post-independence India and their correlations with different architects.
*Source: by the author*

## 2.1 Originating from Art Deco and Indian Deco

Art Deco was prevalent in India, particularly in Mumbai, during the 1920s and 1930s. Later works of some architects known for their Art Deco buildings began to show influences of the emerging International style from America and Europe, while still retaining elements of Art Deco. G.B. Mhatre and Walter Sky George were among these architects.

**The Marble Arch Apartments (1950-55)** by G.B. Mhatre exhibits this transition.

Walter George was an English architect in the post-independence India. **The Tuberculosis Association Building,** New Delhi shows a modification of the prevalent International styles.

Fig. 2.2 : The Marble Arch Building
*Source: @artdecomumbai at X*


Fig 2.5: The Garden Theatre and Lighthouse Cinema illustration
*Source: https://colonialarchitecture.eu/*

## 2.2 International Architects

The first impact of the emerging european ideas on Indian architecture can be seen throught the works of renowned foreign architects, who were not british or working for the british government in India in the 1930s. These architects were hired by the political and business elite of India.

These architects were - Eckart Muthesius, Willem Marinus Dudok, Antonin Raymond and Otto Koenigsberger

1. **Eckart Muthesius** – He was from a german background, but wasn't related to the Bauhuas movement. He was closer to the British life that he inhereted from his father. Yeshwant Rao Holkar II of Indore met Eckert Muthesius while studying at Oxford in 1928. The two became friends over their shared interest in European avant-garde culture and modernism[1]. Holkar later commisioned him to design the **New Indore Palace (1933)** in Manik Bagh Indore (Fig 1.8). Muthesius visited the country for 4 years (1930-34)

2. **Willem Marinus Dudok** – Dudok was a dutch architect from Neatherlands. He designed one major building in India which was commisioned by a group of buisnessman – **The Garden Theatre and Lighthouse Cinema at the movie district (1936-38), Kolkata.** He never seemed to have visited the country. (Lang, Desai, Desai, 1998)

1. https://www.freepressjournal.in/indore/indore-manik-bagh-palace-holkars-abode-now-babus-domain



Fig 2.4: New Indore Palace, Manik Bagh, Indore
*Source: https://www.freepressjournal.in/*

*Fig 2.5: The Garden Theatre and Lighthouse Cinema illustration*
*Source: https://colonialarchitecture.eu/*

3. **Antonin Raymond -** Antonin Raymond was a Czech born architect. He came to India from Japan when the was was apporaching. He worked under Frank Lloyd Wright in Taliesen for 18 years. He is often refered to as the 'the father of modern Japanese architecture'. He, and George Nakashima, and american, designed the **Golconde dormitory at the Aurobindo Ashram (1945)** in Pondicherry. This building is often considered the first reinforced concrete building of India. It was completed in the year 1945. He stayed in India for less than a year. Nakashima is internationally renowned for his wood workmanship and he carried out the Golconde project after Raymond has left India.

The building marks the start of Modernism in India, an expression we later see prominently in Delhi, Ahmedabad and the new planned city of Chandigarh.

Fig 2.6. Images of the Golconda House at the Aurobindo Ashram, Pondicherry
*Source: Architectural Digest India*

4. **Otto Koenigsberger –** He was a jewish architect, born in Germany, completed his education In Berlin, but had to flee the country with the rise of Hitler. He was an award winning (Schinkel Award for architecture in 1927) practing architect in Berlin. Koenigsberger's uncle, Max Born was in Bangalore as a guest of C. V. Raman, the *Diwan* Mirza Ismail (*Diwan* of Mysore) enquired if he know of any trained architect, and this interaction led to Königsberger being appointed as the chief architect and planner to Mysore State, India from 1939 to 1948. One of the prominent building designed by him for Mysore was the **Krishna Rao Pavilion in Bangalore, completed in 1941.** He also designed the **India Institute of Science, Bangalore** for the Tata Group. One of the building in the campus was the Dining Hall/Auditorium

Unlike the other architects discussed above, Koenigsberger has a long association with India. In addition to his extensive government work in Mysore, he built up a private practice, working on large-scale urban planning projects such as the **Jamshedpur** Development Plan for Tata & Sons, or the master plan for **Bhubaneswar**, the new capital of Orissa.
Later he works with the Central government in Delhi for Low-cost housing and the urban planning department. He was a close acquintance of Pandit Jawaharlal Nehru.



## 2.3 Bauhaus in India: First group of foreign trained Indian architects in the 1940s

Architectural expression of the Bauhaus

A group of Indian architects had recived education and training in Britain, Europe or America during the 1940s. They were exposed to **Bauhaus movement** either directly by working and learning under **Walter Gropius** or indirectly by learning about it in their foreign education. This group return backs to India with a great responsibility of nation-building on their shoulders and they go on to design various important institution and housing projects for the developing country that become the landmarks in the history of Indian architecture.

The group consisted of the following architects:

1. Habib Rahman
2. Hanumanthe Rao Naidu
3. Achyute Kanvinde
4. Durga Bajpai
5. Vanu Bhuta
6. Bennett Pithavadian and others

**Habib Rahman, Achyute Kanivnde and Durga Bajpa**i were the prominent architects in the group. The Bauhaus influence can be largely seen in theirs works:

- **The ATIRA building** (1954), Ahmedabad by Achyute Kanvinde
- **The New Secretariat Building** (1945), Kolkata by Ram Rahman
- **Jehangir Art Gallery** (1952), Mumbai by Durga Bajpai (in collaboration with G.M. Bhuta)

This group constitutes the first gerenation of the post-independence architects, and by 1950s this 'International style' was widely evident in India.

Fig 2.7: The New Secretariat Building
*Source: Google Arts and Culture*

Fig 2.7: The Atira Building in Ahmedabad, with a form similar to that of the Bahauas building
*Source: Google Arts and Culture*


Fig 2.8: The Jehangir Art Gallery
*Source: Google Arts and Culture*

## 2.4 Corbusier and Kahn in India

India's independence in 1947 from British rule was followed by the partion of the country into India and Pakistan. To accomodate for the loss of Punjab's capital Lahore, which was a part of Pakistan after partition, India seeked for a new capital for Punjab, which would be symbol of the new independent and progressive state of India.

In 1950, P. N. Thapar, the administrator in charge of the Capital Project and P.L. Verma, the chief engineer of Chandigarh approached Corbusier to design and plan the new capital of Punjab – Chandigarh. They also approached the architect couple Maxwell Fry and Jane Drew. Le Corbusier was accopanied by his associate and cousin - Pierre Jeanneret. Le Corbusier was probably the most **profound foreign influence** on the architecture of post independence India.

His work in **Chandigarh** became the image and symbol for the new 'Modern' India, largely supported by the Prime minister of India, Pandit Jawaharlal Nehru.

'To some architects, Le Corbusier was simply a provider of **a new architectural vocabulary** - **a set of patterns** that they could adopt and adapt. A style of architecture known as **'Chandigarh Architecture'** emerged in India. To other architects he was the progenitor of a whole new line of thinking' (Lang, Desai, Desai, 1998).

By the early sixties, we see a prominent emergence of the patronage for architecture in Delhi, Chandigarh and Ahmedabad.

Le Corbusier's association with **Ahmedabad** starts in the 1960s when he is commissioned his famously known four projects in Ahmedabad by the Industrial elite and the rich textile owners of Gujarat. These projects were:

1. Villa Shodhan (1951-56)
2. Villa Sarabhai (1951)
3. Mill Owner's Association Building (1951-54)
4. Sanskar Kendra Museum (1954-55)

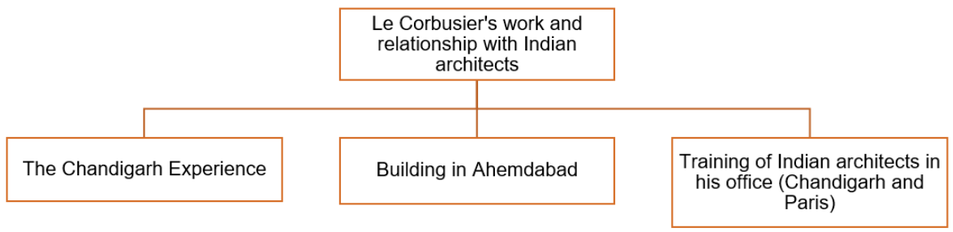



Fig 2.9: Chart showing the different relationships Le Corbusier had with Indian architectd and modern architecture in India
*Source: #SOSBRUTALISM*



Fig 2.10: Sanskar Kendra
*Source: #SOSBRUTALISM*

Fig 2.11: Villa Sarabhai
*Source: Architectural Digest India*

Fig 2.10: Sanskar Kendra
*Source: #SOSBRUTALISM*

Fig 2.11: Villa Sarabhai
*Source: Architectural Digest India*

**B.V. Doshi** was supervising these projects in Ahmedabad on the behalf of Le Corbusier.

The industrial elite of Ahmedabad also played a crucial part in the commissioning the Indian Institute of Management in Ahmedabad which was designed by the master architects Louis I. Kahn. He was assisted by the Indian architects B.V. Doshi, Anant Raje and Achyut Kanvinde. The building plays an important role in the history of modern architecture of India.

*Fig 2.13: Institute of Management, Ahmedabad*
*Source: Arch Daily*

The **Modern School** (197 4-8) in Vasant Vihar, a suburb of south Delhi, designed by Sachdev, Eggleston and Associates, shows a similar architectural expression as Kahn's IIM through:

- load bearing exposed brick walls
- monolithic and mono-textural expression of brick and
- The use of arches and circular opening

One of the principle architects of the firm Sachdev, Eggleston and Associates – Jasbir Sachdev worked with Le Corbusier and Pierre Jeanneret on the Chandigarh Capitol project in his early career.

Fig 2.14. The Modern School, New Delhi ; use of circular opening and arches
*Source: https://worldarchitecture.org*



## 2.5 The second group of foreign trained Indian architects

A second ground of architects returned to India after their education and training in the U.S. and Europe in the 1950s. They were largely influence by, but not limited to, Gropius and Frank Lloyd Wright. After returning to India, they work with the government to build multiple educational institutes, public building, stadiums, office buildings, housing and even urban planning. They also go on to establish renowned private firms.

The group consisted of the following architects:

1. Charles Correa
2. Hasmukh Chandubhai Patel
3. Piloo Mody
4. Ranjit Sabhiki

A group of Indian architects also studies at and worked with **Frank Lloyd Wright at Taliesen**, U.S. during the later 1940s and 1950s. They were:

1. Gautam Sarabhai
2. Gita Sarabhai
3. Mansinh M. Rana
4. Nari Gandhi

### Ex: National Institute of Design (1961), Ahmedabad

National Institute of Design, Ahmedabad was the first design institute of India and followed the academic framework of Bauhaus. It was commissioned by the industrial elite of Ahmedabad and designed by Gautam Sarabhai and Gira Sarabhai. Both the architects had worked under Frank Lloyd Wright in Taliesin.

Fig 15. From the left; Classroom at NID, Boys Hostels at NID
Source: History of NID, NID

The building not only exhibits the new architectural vocabulary of exposed brick and concrete of Chandigarh, but also the influence of Frank Llyod Wright through its forms

Chapter 3

# Modernism and Chandigarh

Prime Minister Nehru believed India's architecture should reflect its new identity. He envisioned cities that embodied democracy, secularism, equality and a focus on science and technology. Modern architecture, with its emphasis on functionality, clear forms, and use of materials like concrete and brick, resonated with these ideals. It offered an architectural style free from religious or cultural ties, creating a truly inclusive environment for all Indians.

## 3.1 During and after Chandigarh – The Impact

The works of Le Corbusier, Pierre Jeanneret, Maxwell Fry,Jane Drew in Chandigarh and those of the Indian architects who worked under them (his 'disciple's work) can be considered the architecture of the Nehru Years (late 1950s and 1960s).

Whilst Le Corbusier was focused on the administrative buildings in Chandigarh, Pierre Jeanneret, the team of Maxwell Fry and Jane Drew together were responsible for evolving over fifty unit designs for various income groups within a strict budget laid down by the Punjab Government, among other projects.

A group of young Indian architects collaborated and worked under Le Corbusier, Pierre Jeanneret, Jane Drew and Maxwell Fry on the enormous task of planning and development on Chandigarh. These young men and women later take forward the Modernism of Chandigarh, re-interpreting it as their own.

Some of these architects were Aditya Prakash, B. V. Doshi, Urmila Eulie Chowdhury, J.K.Chowdhury, Piloo Mody, M.N. Sharma, Prem Nath Thapar, B.P. Mathur, Jeet Lal Malhotra and structural engineer Mahindra Raj.

**Shivdatt Sharma** was one such architect in the team.

The same old materials i.e. bricks, stone and concrete were being used, but they were being used with new buildings techniques and new aesthetic. This created a new architectural language of exposed brick and concrete, which is often referred to as the '**Chandigarh style'.**

Driven by logic and reasoning, the Chandigarh style of architecture was custom made to be economical, fast and efficient to build, locally produced and respond to the climate of Chandigarh.

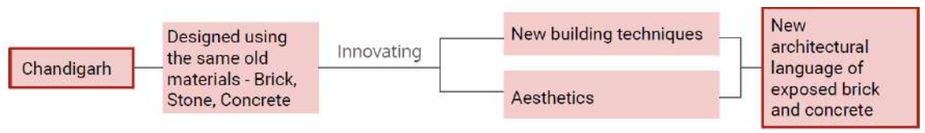



Fig 3.1: Building techniques and asthetics of Chandigarh
*Source: By the author*



Laws of **'Chandigarh Style'** were (Prakash, 2012, p. 11):

- Use of locally available materials
- Example: Brick, stone, concrete
- Simple yet innovative building techniques to be adopted
- Orientation, day lighting and natural ventilation to be taken care of for all spaces.
- Program to be distributed rationally and efficiently
- Materials are to be used unadorned (as far as possible)

In this sense, this Chandigarh style was 'sustainable' before the world started talking about 'sustainability'.

The young Indian architects working in the Capitol Complex project were exposed to these new building techniques and form exploration. **The notions of a finished building changed**. These perceptions altered the look and feel of buildings by young architects in Ahmedabad and North India. Exposed brick-work and concrete were raised to a new aesthetic plane[2]. Prior to Chandigarh, plastered and painted buildings were considered 'finished'.

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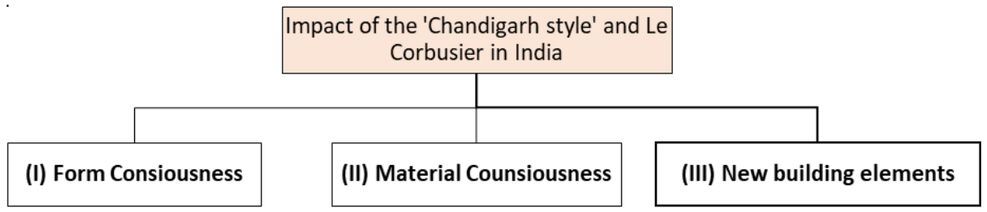



Fig 3.2: Impact of the Chandigarh style on the contemporary architecture of India
*Source: by the author*

## 3.2 The Effect of Chandigarh - Disciples of Corbusier and Jeanneret

During the 1960s and 1970s, the influence of Le Corbusier on Indian architects is more prominent that ever. Some of these architects had the opportunity to work with Le Corbusier and Pierre Jeanneret on the Chandigarh Capitol Project and the others were simply inspired by the presence of Le Corbusier in India and his work in Chandigarh.

Much of the work followed the architectural language of Le Corbusier and Pierre Jeanneret. The later works of these architects evolved **to respond to the Indian context into the buildings, and establish their own identity.**

2. Chatterjee, Malay. "II: 1960 – 1974: The Journey Back from Chandigarh, the Evolution of Contemporary Indian Architecture." In Architecture In India, 132-153. Paris and Milan:Electa Moniteur, 1985.

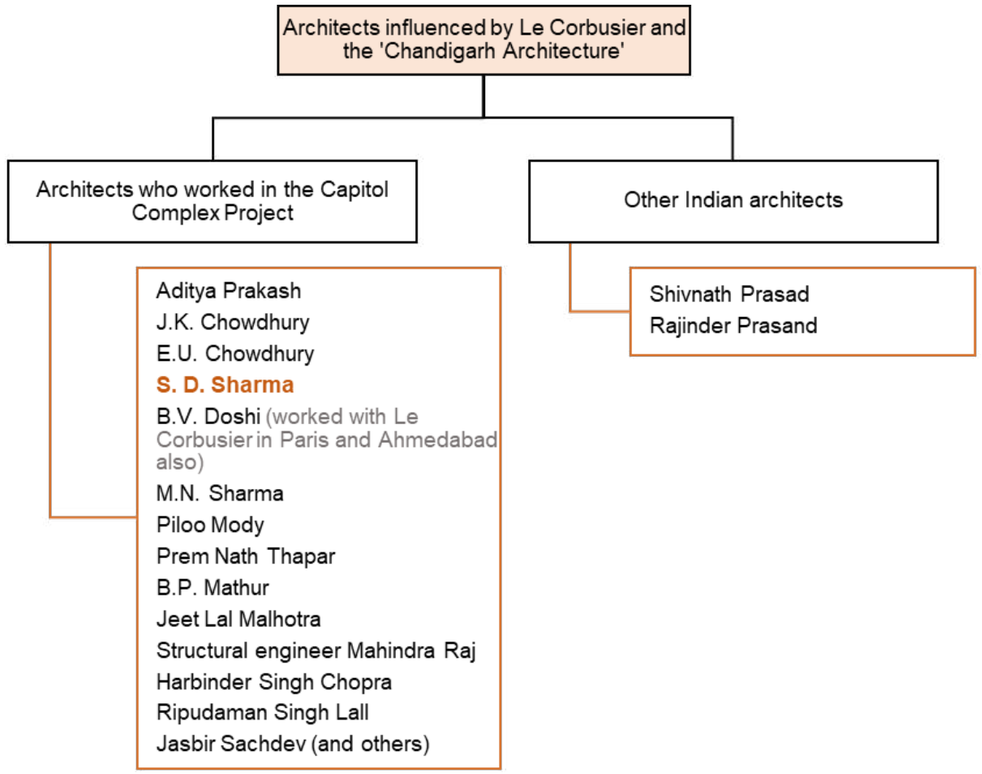



Fig 3.3: Architects whose work was influenced by Le Corbusier's architectural language
*Source: By the author*

**The architectural expression of the 1960s and 1970s see influence from the happening in Chandigarh:**

(I) The **first type** of approach explores the new language of exposed brick and concrete that redefined the use of the already in-use materials Brick and concrete, with new building techniques and aesthetics (mentioned previously).

**Example: Bhaktiben-Hasmukhbhai Residence (1968-69), Ahmedabad**
The Bhaktiben- Hasmukhbhai Residence designed by Hasmukh Patel, was architect's own residence, built in exposed brick and concrete.

The exposed brick wall separates from the concrete column through slit windows, separating the skin and structure of the building, an expression often seen in Chandigarh.



*Fig 3.4: Image showing the separation between the wall and the column. The image also shows the concrete façade of the residence.*
*Source: HCP official website*

Fig 3.5: Interior of the Bhaktiben- Hasmukhbhai residence
*Source: HCP official website*

**Example: Darpana Academy of Performing Arts (1965), Ahmedabad**

The project was designed by Kanvinde Rai and Chowdhury for dancer Mrinalini Sarabhai. She was a member of the industrial elite of the Ahmedabad who also played a role in commissioning Le Corbusier's 4 buildings in Ahmedabad. The academy has an exposed concrete frame structure with brick in-fill walls.
The columns cover the entire height of the structure uninterrupted, with a gap between the columns and wall. The building is raised on *pilotis.* It also has elements like the concrete spout for water drainage and a single wall balcony also seen in the Government Museum and Art Gallery by Le Corbusier in Chandigarh.

Fig 3.6: Image showing the column at the academy
*Source: © Kanvinde Rai & Chowdhury*

Fig 3.7: : Exposed brick and concrete structure
Source: © Kanvinde Rai & Chowdhury

(II) The **second approach** was inspired by the béton brute and plasticity of Le Corbusier. It explored the architectural language and elements of Le Corbusier, specifically;

1. *Brise-soliel* - Vertical concrete louvers used as sun-shading devices.
2. Exposed concrete – with true expression of the formwork
3. Free façade
4. Water-drainage spouts as elements
5. Free standing or exposed staircase and ramps
6. Buildings raised on *Pilotis* – enabling a Free Plan
7. Truthful expression of services on the façade

It also exhibited the pure geometry and Cubism-like approach that was seen in later works of Corbusier and in his works in Chandigarh.[3]

Malay Chatterjee (1985) mentions that a majority of these were forgotten, and deservedly so, since they lacked that seriousness of purpose that Le Corbusier brought to his exploration of form and structure, although with the exception of the works of architect Shivnath Prasad.

### Ex: The Shri Ram Center of Arts, New Delhi by Shivnath Prasad

The project is designed by architect Shivnath Prasad. He was considered the giant of Cobusierism in India. (Bahga, 2016) Shivnath Prasad had never worked under or learned from Le Corbusier but his building reflected a clear influence of the master. The Shri Ram Center of Arts is one such example. It showcases the *beton brute* of Corbusier, with the *brise soliel*, exploration of form, the roof terrace elements, and an exposed staircase at the far end, all of which were important elements of the architectural vocabulary of Le Corbusier.

Fig 3.8: Image showing the use of pure geometry – a square and cylinder; Cubism like approach; showing the front elevation of the building which employs vertical concrete louvers
*Source: ArchitextureZ*

Fig 3.9: Image showing the use of exposed brick in the building.
*Source: blueprint.ozpropertygroup.com*

3. Architecture and Independence by Jon Lang, Madhavi Desai, Micki Desai (1998)



### Ex: Indian Institute of Technology, Delhi by J.K. Chowdhury

The project is designed by J.K. Chowdhury who worked at the Chandigarh Capitol Project under Le Corbusier and Pierre Jeanneret. The buildings at the academic block are completed in exposed concrete. The buildings employ a free facade with vertical louvers placed closely, band windows running along the entire length of the facade. The building also features a free standing exposed concrete stiarcase, resonating with the architectural language of Le Corbusier. The hostel are finished with the exposed brick and plaster finishes, echoing the influence of Jeanneret and Chowdhury's time in Chandigarh.

Fig 3.10: Exposed concrete free standing staircase at IIT Delhi
*Source: Madan Mahatta Archives, PHOTOINK*

Fig 3.11: Image showing the vertical concrete louvers on the façade
*Source: https://www.photoink.net*

Chapter 4

# About Shivdatt Sharma

**Ar. Shivdatt Sharma**
*Photo via Magzter*

## 4.1 Early Life and Education

Shivdatt Sharma was born in Sialkot, now in Pakistan, on 24th November, 1931. He was the eldest son in the family of 4 brothers and a sister. His father was a teacher and a staunch disciplinarian. He is a survivor or the partition of India and Pakistan that took place in 1947. At the age of 16, he had to cross the borders and re-locate to India with his family to escape the massacre. They ended up in a refugee camp in Amritsar and after arriving in India, they had little to no money and no house to live in. He had to take up odd jobs to support the family.

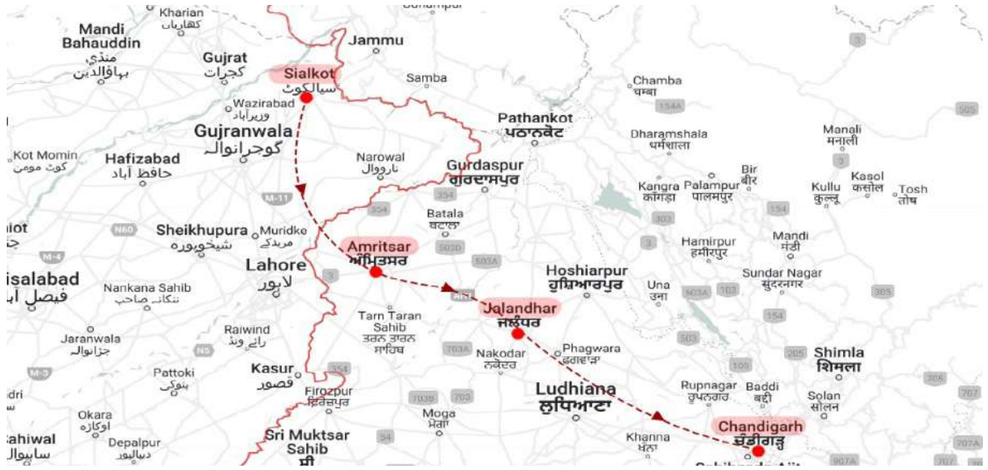



Fig 4.1: Map showing S.D. Sharma's journey during the partition
*Source: By the author*

Later in time, his parents settled up in Jalandhar and he went to Delhi, to stay with a cousin of his, and look for better opportunities. He joins Hindu College and takes up Mathematics and Economics. But because of their financial situation, he wasn't able to pay fees for long and eventually his academic career came to a halt.

At one of the refugee camps, PUSA Institute in Delhi was offering a two-year professional course, with a stipend and a hostel for accommodation. Shivdatt Sharma took this opportunity and joined the course. Along with the course, there was a provision of evening classes to study architecture, and many of his colleagues had joined this class, so he also starts to attend these classes and that was his first introduction to the field of Architecture.

In 1954, in the joined the Chandigarh Capitol project through an advertisement in the newspaper which mentioned that the Chandigarh government was recruiting architects.

He continued his diploma while working and graduated as an architect in 1959.

**The search for better opportunities to become financially independent and support his family was the driving force for Shivdatt Sharma to enter the field of architecture.**

## 4.2 Early Career in Chandigarh

Shivdatt Sharma was one of the few Indian architects who had the opportunity to work with Pierre Jeanneret and Le Corbusier on the Chandigarh Capitol Project.

He joins the Chandigarh Capitol project, from the lowest positions, in 1959, in its initial days. He starts working in the Old Architect's building, now called Le Corbusier Center, which was a temporary building designed by Pierre Jeanneret and it was once of the first buildings to be built in Chandigarh in 1952. The entire team of architects, including Le Corbusier, Pierre Jeanneret, Maxwell Fry and Jane Drew worked from this building.

In his initial years, he starts working with Jane Drew, Maxwell Fry and Pierre Jeanneret, although he spends most of his time working under Pierre Jeanneret. He also worked under architect M.N. Sharma who goes onto become the Chief Architect of Chandigarh after Jeanneret leaves the position. Initially he worked on converting the metric drawings, received from the office of Le Corbusier in Paris to the imperial scale so that it could be used for construction in India. Although the office had a strict hierarchy, Jeanneret made sure all the architects and assistant architects working in the team got a chance to work with him and Le Corbusier. Much later, in the year 2002, Shivdatt Sharma is also appointed to conserve the Old Architect's building now (Le Corbusier Center) where he worked in the initial years of his career.

X semester | Research Thesis
June 2024

# Biographical sketch of architect Shivdatt Sharma

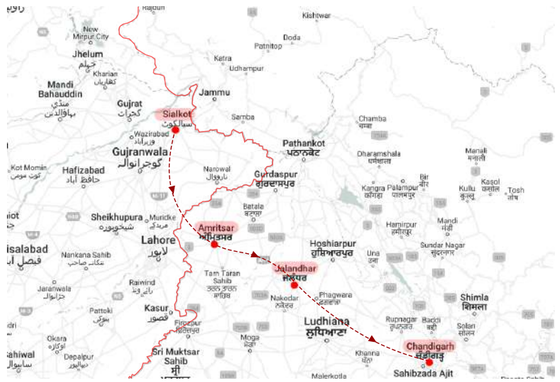
**Early Life** | **Education** | **Work (Chandigarh)** | **Education** | **Work (Bangalore)** | **Work (Chandigarh)**

## 1931 — Born in "Sialkot" (Currently in Pakistan) on 24th November

Family :
Eldest son in the family, with 4 brothers and 1 sister.
Father was a teacher and a staunch disciplinarian.

## 1947 — Partition of India and Pakistan, 16 years old Shivdatt Sharma moved from Sailkot to Amritsar

Was forced to move across the border to India with few means and meagre resources.
He describes the times as extremely hard and difficult.




## 1959 — Graduated as an architect (while he was working)

Obtained his diploma (later degree) from the Delhi Polytechnic College as a private candidate.

Career options and decisions were dictated by the elders in the family: to be an engineer was the norm then.

## 1954 — Joined the Chandigarh Capitol project through an advertisement in the newspaper which mentioned that the Chandigarh government was recruiting architects.

Initial salaries went into the upbringing on his siblings.

Starts by drafting drawings for the Capital Complex Project in the temporary building designed by Pierre Jeanneret called the Architect's Office Building, now renamed as the Le Corbusier center.

Initially worked with Maxwell Fry and Jane Drew

## 1962 — First independent project under the Chandigarh office - The Art School Hostel at Sector 10, V2

## 1963 — Appointed as an Architect

## 1963 — Starts working on the project - Museum and Art Gallery in Sector 10 with Le Corbusier

## Mid - 1960s — Starts working with Pierre Jeanneret on a private project - Gautaum Sehgal's residence

## 1965-1966 — Went on to do his Masters from Milan on an Italian Scholarship

## 1973 — Joins ISRO as the Chief Architect and moves to Bangalore

Works with some of the most renowned scientist like Dr. Vikram Sarabhai and Dr. Homi J. Bhabha

Shivdatt Sharma describes this phase of his career as very satisfying and rewarding.
He was working with a different region and climate, and this made it necessary for him to find appropriate ways to build and incorporate local ways of building.

## 1979 — Retirement from Government Service

## 1980 — Starts his own private practice in Chandigarh

Almost at the age of 50, Shivdatt Sharma started his office out of his home in Sector 15, Chandigarh. Later moved to a commercial area in Panchkula.

## 1988 — Sangeet Sharma, Shivdatt Sharma's son joins the firm

He is made partner in the firm in 1994.

## 4.3 Career Overview

I - Department of Architecture, Chandigarh (1959-73) - 12 years
II - Depart of Space, ISRO, Bangalore (1973-79) - 6 years
III- Private Practice (1980 - Present)

## 4.4 Lasting Lessons from the Legends[4]

*This section covers the learnings of Shivdatt Sharma from his masters as he expresses it himself and in interviews. These are idealogy based learnings from his masters, Le Corbusier and Pierre Jeanneret. The sections also covers his understanding of the works and idealogies of the masters and how it manifested in their buildings and architecture.*

**Geometry:** Le Corbusier and his associates believed that the geometry was a timeless factor in the whole universe, and was therefore to be followed to create purity.

**Purity**: Here meant that the architecture was based on rationality, logic and a sympathetic cosmic relationship with the universe.

**Looking at the future:** They did not follow any traditions, as they believed that those were the thoughts of the past, and to really progress, one had to move towards new thoughts. This was one of the reasons why Le Corbusier and his team were selected for the planning and development of Chandigarh, because the city was visioned as a symbol of freedom and development. Le Corbusier's vision for Chandigarh aligned with Nehru's vision for a modern, technology and science based new India.

> *"We thought that his (Le Corbusier) philosophy and modernism concept are very vital for the modern world. And we adopted that as a second religion."*
>
> *– S.D. Sharma*

### Pierre Jeanneret:

Pierre Jeanneret's work was highly artistic, innovative and poetic, like a sculptor's.
He believed in the following:

- *Art and architecture do not express without dignity, which requires spirit and talent.*
- *Vulgar people are those who cannot express dignity without money.*
- *Insensitive people appreciate work that is represented by a lot of money, large number of working hours, and rich material- although such work is often grotesque and devoid of art.*
- *Poverty is no excuse to ugliness.*

4. Monologue by S.D. Sharma in the book 'Architecture of Shivdatt Sharma' by Vikramaditya Prakash (2012)



Pierre Jeanneret's designs in Chandigarh reflect his keen understanding of Indian needs and sensitivity towards the said needs. He incorporated open spaces like courtyards, terraces, balconies and backyards for year-round activities and prioritized quality living conditions for all, including the poorest, with well-ventilated spaces, natural light, and ample areas to move.

The housing he designed for Chandigarh aimed to not only be **comfortable** and **cater to the needs of the users**, but also be **aesthetically pleasing** by **optimizing the limited resources** that were available.

Shivdatt Sharma mentions that Jeanneret's work left a lasting impact on his mind, and throughout his career he could clearly see his influence on his independent work.

Since Jeanneret wanted to express dignity without money, as was required for the Chandigarh city, he took inspiration from the surrounding villages. He called them the 'living galleries or art'. He saw certain similarities in these villages and the principles of Chandigarh's planning and architecture:

- In the plasticity of the form mono-textural expression; since the houses in the villages were plastered with mud
- Standardized doors and windows and other fenestration
- Elements like spouts and niches
- Standardized boundary walls and gates

During the mid-1960s, Shivdatt Sharma gets an opportunity to work with Pierre Jeanneret personally on the Gautam Sehgal Residence, which was a private project taken up by Pierre Jeanneret, and hence they had to work after the office hours on this project.

> Is like evoking a calm, serene, meditative person, with a glint of love in his eyes, who lived a life of a saint. A great architect and a noble human being who would discreetly enter your heart without even your noticing, to stay there forever."
>
> *S.D. Sharma - Framed in the Peirre Jeanneret Museum in Chandigarh*

Fig 4.4: Gautam Sehgal's Residence, Chandigarh
*Source: 'Shivdatt Sharma: Life and Works' by S.S. Bhatti*

He allowed the his team of Indian architects to deal with projects independently, which would be sanctioned with his last approval, and this allowed the architects to maneuver from the 'laws' and explore their own style which would still have glimpsed of the 'Chandigarh style' in them.

Although Jeanneret was a creative genius, but he was full of kindness and lacked any ill-nature. He was simple in his work and lifestyle.
Jeanneret's architecture was **personal and humane**. It was more subtle and softer as compared to Le Corbusier's work which was **more dominant and provoked grandeur**. One of the reasons for this could also be the typology that the two architects worked on in Chandigarh. Le Corbusier was majorly involved in the making of the administrative buildings whereas Jeanneret majorly worked on housing and commercial projects with the exception of a few institutional projects.

## Le Corbusier

Le Corbusier expressed his concern for climate in India –

> *'besides the administrative and financial regulations, there was the Law of the Sun in India: a calendar of sensational temperatures, extraordinary dry or humid according to the season or the location. The architectural problem consists – first to make shade, second to make a current of air, third to control hydraulics.'*[5]

- stating that protection from sun, providing effective air ventilation and ensuring water drainage were the three problems that had to be dealt with utmost attention for the tropical climate of India.

Shivdatt Sharma had the opportunity to work with Le Corbusier on the **Government Museum and Art Gallery** in the Leisure Valley of Chandigarh.
The premise also has the **Museum of Architecture** and The Museum of Life and Evolution. Shivdatt Sharma was a part of a team that was involved in designing the Museum of Architecture and he independently designed **the Museum of Life and Evolution.**


Fig 4.5: Plan showing the Leisure Valley complex at Sector 10, Chandigarh
*Source: by the author*

The first and foremost thing that S.D. Sharma learns from Corbusier was to be exact and detail oriented. Every sketch Corbusier drew was full of dimensions and had detailed descriptions with mathematic calculation and reasoning.

5. Mentioned in the book 'Le Corbusier and Pierre Jeanneret: The Indian Architecture by Surinder Bahga and Sarbjit Bahga



## 4.5 Ideologies on Modernism

During his diverse career, his efforts have been dedicated to extending the philosophies of Pierre Jeanneret and Le Corbusier that were, ***pure architecture, no superficialities, towards the honest expression and glorification of versatile materials like brick and concrete*** that were chosen for noble and aesthetic reasons.[6]

He firmly calls himself and Modernist and believes in the modernist ideologies promoted by the 'masters' in Chandigarh.

> **Modernism as a timeless concept-** He walked on the path shown to him by the 'masters' themselves and he followed it as a second religion. He believes that Modernism is an ideology and way of building that is *based on rationality and logical thinking*, and hence it is not limited to a time period or an 'era' and is a timeless concept.[7] He does not believe in the 'isms' of architecture.

His ideals and philosophies around modernism can be summed up in 3 words:

- **Purity**
- **Simplicity**
- **Geometrical order**

*The 'purity of head and heart' is necessary to create devout architecture which can only be created by lifelong dedication like the monks in a monastery, those who have spiritual fixation and hunger for perfection.*

***'Purity'** is to create aesthetic charm without restoring to any superficiality. It is not a matter of fashion or of vogue; it is an attitude of mind and procedure. Only purity sustains in the high moments of history.*

***'Geometry'** unifies the whole universe and it can create poetry, harmony and bring in the overall order. Simplicity and purity at times overlap each other.*

*The **'simplicity'** speaks of silence and peace which are its basics. **Simple restraint in life** can curb all types of natural calamities like global warming, carbon footprints, environmental pollution, etc. and in the process, it can help sustainability on this planet.[8]*

6. Shivdatt Sharma mentions in his monologue titles 'Lasting lessons from the Legends' in the book 'Architecture by Shivdatt Sharma' by Vikramaditya Prakash (2012)
7. Interview with Shivdatt Sharma on 15th Feb 2024
8. Mentioned in the article 'MODERN HERITAGE: IN RETROSPECTION: SHIVDATT SHARMA', articulated by his son and architect, Sangeet Sharma; Thinkmatter (2014)

## 4.6 Physical Attributes of his Modernism

Below mentioned are some of the physical attributes that manifests Shivdatt Sharma's idea of Modernism[9]:

**Geometry:** Architecture based on pure geometry; rendered in mono-texture. He believes that geometry is as important to architecture as rhythm is to poetry.

**Mono-texture:** The mono-texture rendering of the buildings gives a sculptural expression. It also related to the idea of being true to a material and to devoid the building of any superficialities or external ornamentation.

**Solid forms:** Fewer opening enhance the form. If the form is punctured indiscriminately, the solid surface loses its impact.

**Ornamentation:** Ornamentation is still seen in his work, but it is not applied, neither is it through the historical borrowings of *chajjas, chatris*, domes and arches, but rather thought architecture elements, namely – Stairways, ramps, skylights and openings.

- Stairways and Ramps: Through the stairways and ramps, one can see the activity going inside the building and it gives a sense of participation even when it is being observed from the outside.

The staircase and ramp placed outside the building as an element, like that seen in the Mill Owner's Building in Ahmedabad by Le Corbusier, is and often used elements by him.

This enables the user to unfold a journey and finally reach the destination which the building

- Skylights: Skylights act as an important elements for natural lighting and ventilation inside a building. It also increases the volume of the spaces and adds a dimension to the void.
- Openings: Openings as a response to climate. The no. of openings and how they are places becomes important.
  It is an elements that is necessary both for climatic and aesthetic reasons.

  Cross ventilation, natural ventilation, sunlight, visual connection, placement of openings etc.

9. 'A mentor for Posterity' article by Ar. Apurva Bose Dutta in Design Detail (year unknown)

Chapter 5

# Career – Practice Overview and Project Timeline

Shivdatt Sharma's decade's long career has been divided into 3 phases (Prakash, 2012), (Bhatti, 2017):

1. Department of Architecture, Chandigarh
2. Department of Space, ISRO
3. Private Practice.

## 5.1 Department of Architecture, Chandigarh

Architect: Chandigarh Capitol Project (1963-1973)

Ar. Shivdatt Sharma worked in the Department of Architecture, Chandigarh from 1963 to 1973 as an assistant architect and later promoted to architect. These were the defining formative years of Shivdatt Sharma's career that molded his ideologies and philosophies as an architect. Here, he learnt the art and craft of Indian Modernism in the very *laboratory* where it was being developed. (Prakash, 2012)

He develops his ideologies around modernism during this time and the influence of this time can be seen in his work throughout his career. Shivdatt Sharma gets his first chance to work with Le Corbusier in 1963 on the Government Museum and Art Gallery, in the cultural belt of the city in Sector 10, which is a part of the leisure valley. Later when Le Corbusier dies in 1965, the responsibility to complete the project falls on Shivdatt Sharma.

Fig 5.1: Government Museum and Art Gallery
*Source: © Kai K Gutschow*

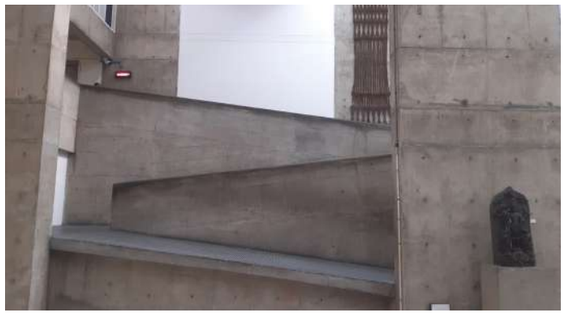


Fig 5.2: Ramp at the Government Museum and Art Gallery
*Source: by the author*

Other projects from this phase include:

1. The hostel at Art College (1963-65), Chandigarh
2. Shri Guru Singh Sabha Gurudwara (1963-64), Chandigarh
3. Club house for Golf Course (1965-67), Chandigarh
4. The Museum of Science and Evolution (1965-67), Chandigarh.
5. The CSIO Campus (1963-66) (Laboratories, Cafeteria, Hostel and Staff Housing), Chandigarh



## 5.2 Department of Space, ISRO, Bangalore

Chief Architect (1973-1979)

Shivdatt Sharma was offered the post of Chief Architect at the Indian Space Research Organization (ISRO) in Bangalore.

Shivdatt Sharma describes this phase of his career as **very satisfying and rewarding**.[10] He was working with a different region and climate, and this made it necessary for him to find appropriate ways to build and incorporate local ways of building. This ranged from working with indigenous materials like stone in the VSSC Central School in Bangalore to using prefabricated components in regions which were remote and difficult to build and for faster construction, seen in the Pressure Transducer Unit in Bangalore.

The projects were different from the ones that Shivdatt Sharma had handled before. He was required to design according to the sophisticated services required for Space research infrastructure like magnetic shielding, creation of clean areas and designing areas with controlled humidity, noise, vibrations and temperature. This could be described as **'service-focused architecture'** (Prakash, 2012, p. 66).

He mentions that he had the creative freedom while designing for ISRO, as these were scientist and they were open to new and innovative ideas.[11] One such case was of the Vikram Sarabhai Hall, located in the ISRO Campus at Ahmedabad. The building is made primarily from 3 triangles of varying height, length and breadth, and each house similar functions like lecture hall, auditoriums and exhibitions spaces. Shivdatt Sharma mentioned that the organization readily welcomed the idea, requiring only brief explanation on his part to secure their support.

## 5.3 Private Practice

**Practicing Architect (1979- till date)**

In 1979, almost at the age of 50, Shivdatt Sharma took a voluntary retirement from ISRO, since there were only odd jobs left to be done, and returned to Chandigarh to start his own private practice. During this phase, he had to opportunity to design a wide-range of projects.

These included new typologies such as large-scale hospitals, commercial complexes, shopping plazas, resorts, a church etc. The projects spanned from small bungalows to expansive large-scale projects.

Some of the projects from this phase were:

1. The Auditorium and Convention Center for SGPGIMS, Lucknow (1988-90)
2. DLF Shopping Plaza, Gurgaon (1989-92)
3. Advanced Eye Care Center, PGIMER, Chandigarh (1996-2000)
4. Navjeevan Church, Chandigarh (1998-99)

In the Bamboo Museum, Palampur (2010-11) he designs the museum entirely with bamboo, a material he had never worked with before.

10. In an interview with Shivdatt Sharma on 15th Feb 2024
11. While talking about the creative freedom he had while working with the government till 1979, as compared to his private practice after 1980.

Chapter 6

# Evolution – Design Phases

Apart from the phases based on his role, Shivdatt Sharma's long career can be also categorized in 3 phases based on:

- Influence of Le Corbusier and Pierre Jeanneret
- Reflecting his architectural language
- Development of the physical attributes of his modernism- as they become more evident
- Progression towards contemporary design
- Experimentation with materials and forms

The three phases are:

1. **The Early Phase** (Working under the master architects – Le Corbusier and Pierre Jeanneret)
2. **Synthesis of the Influence**
3. **Towards a new Style** (diverging from this influence)

Each phase is studied through 3 buildings under the following 4 parameters:

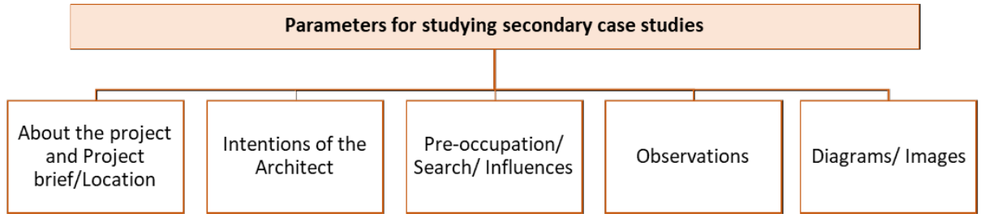



Fig 6.1: Table of parameters for secondary case studies
*Source: Drawn parallets from an undergraduate thesis titled 'Evolution of Architectural Language in the work of a Contemporary Indian Architect: B.V. Doshi: A Study' by Kartikey Shodhan (1993) from CEPT University.*

## Selection Criteria for Secondary Case Studies

The selection of secondary case studies for this thesis was guided by several key criteria.
**Contant Location:** Many projects were chosen from Chandigarh, as it was where the architect started his career and continued his private practice. This enabled a comparison of different buildings from various phases of his career within the same city, allowing for a clearer understanding of his evolution over time.
**Accesibility:** The choice of Chandigarh projects was influenced by the accessibility and familiarity with these buildings, facilitating easier site visits and deeper analysis.

Furthermore, **Ahmedabad** was included as a significant location due to its prominence in the post-independence era, providing valuable insights into the architectural developments of that period.



## 6.1 The Early Phase

(Working under the master architects – Le Corbusier and Pierre Jeanneret)

- Hostel at Art College, Chandigarh (1963-65)
- Shri Guru Singh Sabha Gurudwara (1963-64), Chandigarh
- Faculty Guest House, CSIO, Chandigarh (1963-66)
- Club House for Golf Course, Chandigarh (1965-67)
- The Museum of Life and Evolution, Chandigarh (1965-67)

(REFER TO THE FOLD SHEET FOR THE SECONDARY CASE STUDY)

## 6.2 Synthesis of the Influence

(Integrating principles with own architectural style and element)

- Pressure Transducer Unit, Bangalore (1973-80)
- DLF Shopping Plaza and Arcade, Gurgaon (1989-92)
- Auditorium at Carmel Convent School, Chandigarh (1992-93)
- Pracheen Kala Kendra, Chandigarh (1998-99)

(REFER TO THE FOLD SHEET FOR THE SECONDARY CASE STUDY)

## 6.3 Towards a new Style

(Diverging from this influence)

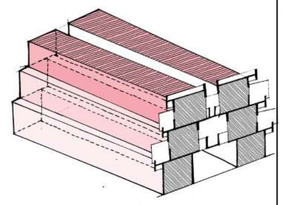
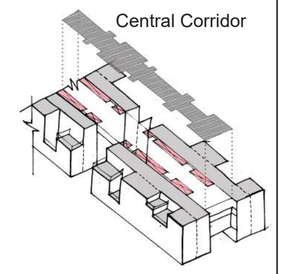
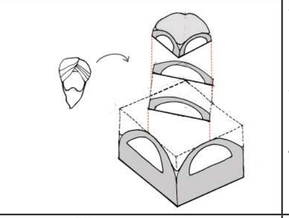
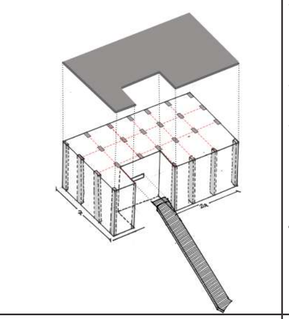
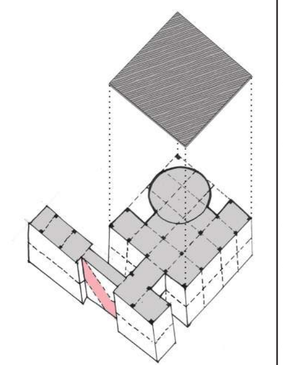
- Auditorium and Convention Center, Lucknow (SGPGIMS) (1988-90)
- New OP Block, Chandigarh (1992-94)
- National Institute of Pharmaceutical Education and Research, Mohali (1992-94)
- Advanced Eye Care Center, PGIMER (1999-2000)

(REFER TO THE FOLD SHEET FOR THE SECONDARY CASE STUDY)

# Phase I -The Early Phase

(1960s -1980s)

Working with Le Corbusier and Pierre Jeanneret - Architectural language of the masters

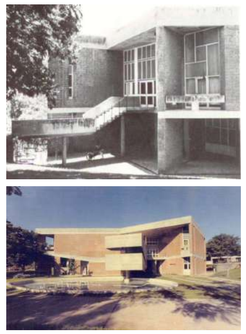
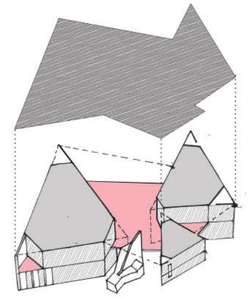
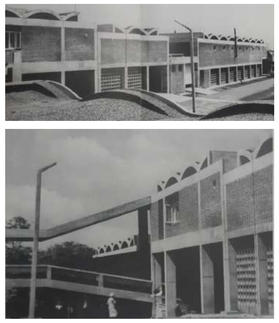
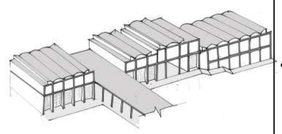
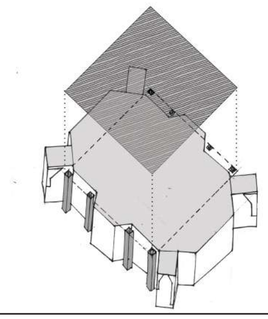
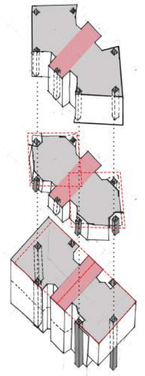
| S.no. | Project | About | Image | Intent of the architect | Pre-occupation/ search/ influences | Geometry/ Form | Diagrams | Observations |
|---|---|---|---|---|---|---|---|---|
| 1. | **Hostel at Art College**<br>(1963-65)<br>Chandigarh | • First independent project under the Chandigarh Project |  | • **To create a sense of community** - central corridor between 2 rows of rooms; the staggering of floor in a pyramidal section enables visual connection<br>• **Creating comfortable spaces -** response to climate- The staggering of floors in a pyramidal section -Allowing penetration of natural light, ventilation, 'all -year round' living. | • Use of exposed brick and concrete<br>• Load bearing walls with concrete beams, lintels and overhang.<br>• Use of rubble stone masonry to break the monotony of brick - an element also used often by Pierre Jeanneret while designing housing<br>• Balconies with concrete parapet in the front and steel railing on the side- also seen in the Government Museum and Art Gallery by Le Corbusier. | • **Stepped pyramid** like form- continuous uniform section through out the length of the building.<br>• Section reflected in the front facade. |  | • Repetition of a module<br>• The **form** is derived from rational problem-solving rather than just aesthetics; although it serves both.<br>• The circular cafeteria breaks the rectilinear form of the overall building<br>• the '**drama**' in the building can be seen in the section. |
| 2. | **Faculty Guest House**<br>(1963-66)<br>Chandigarh | • Part of the CSIO campus in Sector 30, Chandigarh - which also has other buildings designed by Shivdatt Sharma<br>• Originally designed to be a boys hostel, later converted to a Guest House. |  <br>  | • **To create a sense of community** - central corridor between 2 rows of rooms<br>• **Creating comfortable spaces -** response to climate- Central corridor and the perpendicular passages that lead to the entrance of the rooms- create numerous small courtyards - natural light and ventilation<br>• **Understanding and catering to India's need for outdoor living-** Providing open spaces- balconies and open terraces. | • Use of exposed brick - **Monolithic expression of brick** - walls, parapets, in-built furniture<br>• Brick *jali* wall as parapet<br>• Small vertical windows, deep recessed<br>• How to provide open spaces to all the unit?<br>• How to ensure natural light and ventilation?<br>• The **stepped balcony** was method Pierre Jeanneret used to provide open spaces to all the users in government housing. | |  | • Repetition of a module<br>• Section is similar to that of the Hostel at Art College<br>• Use of balconies and open-terraces is also seen in the housing designed by Pierre Jeanneret- sensitivity to people's needs<br>• **Mono-textural expression** with exposed brick. |
| 3. | **Shri Guru Singh Sabha Gurudwara**<br>(1963-64)<br>Chandigarh | • Modern interpretation of a religious building.<br>• The clients wanted the Gurudwara to be unique. |  | • To stray away from the traditional profile of a Gurdwara which was a dome like roof. | • Use of exposed concrete - use of its **plasticity for form** - Influence of Le Corbusier<br>• Plan is based on a **grid - Open Plan**<br>• Use of **ramp** on the facade as an element<br>• How to rethink a religious building and make it modern?<br>• Took inspiration from the 'Sikh Turban'- **visual metaphor** | • Same unit is repeated vertically thrice, twisted at 45° at each level to achieve the required form. Ultimately **resembling a dome-like structure.** |  | • Following the **beton brute** of Corbusier but experimentation with the form - exploring the structural possibilities of concrete<br>• Attempt to move out of the defined 'rules' of Chandigarh style of architecture<br>• **Mono-textural expression** with exposed concrete. |
| 4. | **Clubhouse for Golf Course**<br>(1965-67)<br>Chandigarh | • A pavilion like small clubhouse for the Golf Course - near Sukhna Lake |  <br>  | • Aesthetics was important for this project based on its function | • Use of the **exposed brick and concrete** architectural language of 'Chandigarh style' - Concrete frame structure with brick walls.<br>• Use of **undulatory glazing** as skin and in openings<br>• Plan is based on a **grid - Open Plan**<br>• Use of a **ramp** as an element in the front, perpendicular to the facade, giving access to the mezzanine floor - inspiration from Corbusier.<br>• **Columns** uninterrupted on the facade - from plinth to roof<br>• The walls are recessed further inside from the columns - to separately express the **'skin'** and **'structure'** of the building. | |  | • To provide shading - the **'skin'** of the undulatory glazing windows is **'pushed'** inside the grid of columns to create overhang.<br>• Perfectly fitting with the established 'Chandigarh style' architecture.<br>• The **ramp** has a concrete railing on the left and steel railing on the right - similar to the ramp of the Mill Owner's Association buildings by Le Corbusier in Ahmedabad.<br>• **Full height windows and openings** - spanning from the floor to the ceiling. |
| 5. | **Museum of Life and Evolution**<br>(1965-67)<br>Chandigarh | • Commissioned by **Dr. Randhawa** - Chandigarh's first Chief Commissioner<br>• The purpose of this museum building, as stated by Dr. Randhawa was **to impart the knowledge of evolution** of life and human beings to the general public.<br>• He wanted a **continuous circular diorama** to illustrate the story of evolution of the human life.<br>• Described as the **'master work'** of the architect by Vikramaditya Prakash in his book ' Architecture of Shivdatt Sharma (2012). |  <br>  | • To cater to the requirement of the cyclorama.<br>• To design a building respecting the Government Museum and Art Gallery by his mentor Le Corbusier in the same complex. | • Use of the **exposed brick and concrete** architectural language of 'Chandigarh style' - Concrete frame structure with brick walls.<br>• Brick tile places **edge to edge, not staggering**<br>• Use of **undulatory glazing** as skin in the ground floor and as openings on the first floor.<br>• Use of slit windows<br>• **Plan is based on a grid - Open Plan**<br>• Use of a **ramp** as an element in the west facade.<br>• Raised on *pilotis* - similar to the Government Museum and Art Gallery<br>• **Columns** uninterrupted on the facade - from plinth to roof<br>• A gap is given between the RCC column and the brick wall, which has a recess window.<br>• This gap separates the **'skin'** and the **'structure'** of the building visually. This is commonly seen in the architectural language of Chandigarh. | • The cyclorama is a **perfect cylinder** that is embedded in the **cube** of the main museum building.<br>• The cyclorama is devoid of any openings **(solid surface)** and gives the impression of perfect geometry. **(Solid forms)**<br>• The cyclorama - a cylinder , and the main museum building - a cube, creating **solid forms.**<br>• Avoiding punctures in between of a plane – a continuous plane is either completely open through windows or completely closed through a wall. **(Solid surface and forms)** |  | • Shivdatt Sharma opts to design with a similar architectural language as the Government Museum and Art Gallery by Le Corbusier in the same complex - while bringing in his own elements.<br>• The ramp - although an elements taken from Corbusier, is covered with concrete walls with openings.<br>• To provide shading - the **'skin'** of the undulatory glazing windows is **'pushed'** inside the grid of columns to create overhang.<br>• **Mono-textural expression** with exposed brick.<br>• The **roof** is extended over the cyclorama - the overhang of the roof over the negative spaces cyclorama creates deep shadows.<br>• **Full height windows and openings** - spanning from the floor to the ceiling. |

FORM
STRUCTURE
FORM
MATERIAL
FORM
MATERIAL
OPENINGS
RAMP
FORM
MATERIAL
OPENINGS
RAMP

# Phase II - Synthesis of the Influence

(1980s -2000s)

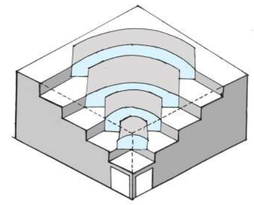
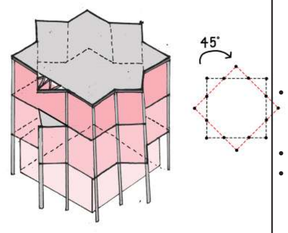
Integrating principles with own architectural style and element

| S.no. | Project | About | Image | Intent of the architect | Pre-occupation/ search/ influences | Geometry/ Form | Diagrams | Observations | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | **Vikram Sarabhai Hall**<br>(1973-80)<br>Ahmedabad | • Located in the Space Application center at the ISRO Campus at Ahmedabad.<br>• He mentions that he had the creative freedom while designing for ISRO, as these were scientist and they were open to new and innovative ideas.<br>• The purpose of the building was to serves as an exhibition space with lecture rooms and an auditorium. |  | • To create harmony between the three functions of the building - exhibition center, lecture halls and auditorium<br>• Fast and efficient construction | • Use of free standing exposed concrete **ramp**, perpendicular to the facade of the building, as an element- similar to the ramp of the Mill Owner's Association buildings by Le Corbusier in Ahmedabad.<br>• Use of a **staircase** supported by one concrete column as an element on the facade.<br>• Use of the **exposed brick and concrete** architectural language of 'Chandigarh style' - Concrete frame structure with brick walls.<br>• **Raised on columns**; although the columns are wider and made of brick.<br>• Use of **slit recessed windows**<br>• Search of something new and innovative | • The form of the building consists of **3 equilateral triangles** of varying sizes - pointing inwards to the lobby.<br>• The roof is spanned by triangular, **pre-cast waffle shells**.<br>• The **walls** of the triangular plan are chamfered and openings are given- but the roof extend to complete the triangle - **creating overhang.**<br>• Avoiding punctures in between of a plane – a continuous plane is either completely open through windows or completely closed through a wall. **(Solid surface and forms)** |  | • The concept of *pilotis* can be seen, but it is abstracted.<br>• The building is based on a **triangular grid** - the larger triangle spaces are based on the pre-case waffle shell units.<br>• The **roof** is extended over the triangular plan (in a straight line) - the overhang of the roof over the negative spaces on the triangle creates deep shadows.<br>• The irregular plan and form of the building shows deviation from the 'Chandigarh style of architecture'.<br>• The use of pre case waffle shell enabled faster construction of the buildings - fulfilling the intent.<br>• The **staircase** has a concrete railing on the left and steel railing on the right - similar to the ramp of the Mill Owner's Association buildings by Le Corbusier in Ahmedabad. | FORM<br>STRUCTURE<br>MATERIAL |
| 2. | **Ammonium Perchlorate Experimental Plant**<br>(1973-80)<br>Alwaye | • Experimental plant for ISRO at Alwaye - designed during his time as the Chief Architects of ISRO.<br>• Catering to the complex needs of the space technology - sophisticated services like precision thermal and humidity control, magnetic shielding etc. |  | • To create work-suitable and comfortable spaces for the scientists and staff.<br>• Fast and efficient construction | • Use of the **exposed brick and concrete** architectural language of 'Chandigarh style' - Concrete frame structure with brick walls.<br>• Raised on pilotis - Concrete columns.<br>• Use of **slit recessed windows**<br>• Ramp is used an element on the facade - goes along the building.<br>• **Curvilinear plan** is used for the open yards - attached to the ends of the building -also seen in the Hostel for Art College.<br>• **Circular openings (RCC)** on exposed brick walls used for ventilation - also seen in U.T. Guest and Golf course Clubhouse, Chandigarh.<br>• Creating 'services and science focused' architecture. | • The roof is made of cylindrical concrete shells - for larger spanning. |  | • Instead of undulatory windows, pre-cast jali blocks are used for **opening** on the ground floor.<br>• The arch profile of the cylinderical shells is used as **skylights.**<br>• **Circular openings** (RCC) on exposed brick walls used for ventilation - much bigger in size and more prominent in the facade.<br>• **True expression of material and structure.** | MATERIAL<br>OPENINGS |
| 4. | **Auditorium at Carmel Convent School**<br>(1992-93)<br>Chandigarh | • Multi functional hall for year-around use with 1000 seats, in the campus of Carmel Convent School, Sector 9, Chandigarh.<br>• Low budget project<br>• The clients wanted the buildings to be remarkable but simple since it is for a charitable school. |  | • To create a building the would be remarkable and leave an impact, but not look extravagant. | • Use of exposed brick - **monolithic expression of brick. The columns are made of exposed concrete.**<br>• **Provision of skylights**<br>• The columns and walls are separate by a gap - similar detail can be seen in the Museum of life and Evolution and Clubhouse for Golf Course, Chandigarh.<br>• The services and staircase are expressed as a separate block in facade.<br>• *To create a symbolic building with maximizing utility. (Prakash, 2012)* | • The Auditorium can be seen as a cuboid form with **chamfered corners**. Each corner a service block that project outwards.<br>• Openings are given only on the chamfered edges - The other sides **create solid planes and express solid monolithic forms.**<br>Similar form and expression can be seen in Tribune Model School, Chandigarh |  | • Brick was chosen as a material to fulfill the intent.<br>• All the concrete columns that span the steel truss roof, can be seen on the facade. - True expression of structure.<br>• The steel truss, that is used for spanning the roof, is also left exposed, both inside and outside the buildings.<br>• The use of glass, steel and brick in the service/ staircase block can be considered o**rnamentation** - not seen before in his work. | STRUCTURE<br>MATERIAL<br>OPENINGS |
| 5. | **Pracheen Kala Kendra**<br>(1998-99)<br>Chandigarh | • The purpose of the building was to teach and promote traditional Indian music and dance. |  | • Distinguished by modest expression<br>• To depict *'rasa'* or rhythm in the structure. | • Use of exposed brick - **monolithic expression of brick.**<br>• Exposed concrete is used for columns, beams, lintels, parapets and louvers on the facade.<br>• Concrete louvers are also used as a distinctive element on the brick facade.<br>• The services and vertical circulation are expressed as a separate block in facade.<br>• The corners of the square are chamfered and openings are given- but the roof extend to complete the square - **creating overhang.** Also seen in the Vikram Sarabhai Hall and Museum of Life and Evolution | • The ground floor and first floor are comprised of **2 cubes**, placed **edge to edge** - with the service block in between. **2 large columns** are places on the long side and one on the short edge.<br>• The second floor and third floor are also comprised of **2 cubes**, but they are **rotated at 45°,** and placed with **corner to corner**, with the services block in between. The **corners are chamfered**. **Columns** are aligned with the lower floor, and are places on the corners of the cubes.<br>• **Solid forms** - solid continuous planes with minimum punctures. |  | • The concrete louvers, although taken from 'Chandigarh Style', is larger in size and abstracted.<br>• Intent to express 'rass' is achieved through form.<br>• **Deep recessed windows**, formed between 2 hollow brick columns.<br>• Columns can be seen distinctively in the facade in the lower floors and then inside the building on the upper floors - separating the **'skin' and 'structure'** of the building. - Similar detail can be seen in the Auditorium for Carmel Convent School, Chandigarh | STRUCTURE<br>MATERIAL<br>OPENINGS |

# Phase III - Towards a new language

(1990s -2010s)

Physical attributes become more evident - driven by innovation and experimentation

| S.no. | Project | About | Image | Intent of the architect | Pre-occupation/ search/ influences | Goemetry/ Form | Diagrams | Observations |
|---|---|---|---|---|---|---|---|---|
| 1. | **Auditorium and Convention Center**<br>(1988-90)<br>Lucknow (SGPGIMS) | • Winning entry in the closed architectural competition hosted by the Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPIMS)<br>• The building is situated in the middle of the campus.<br>• The building consists of an auditorium and multifunctional hall, lecture rooms and an admin area.<br>• The biref was to create a **'visual icon'** for the campus. |  | • To create a **visual icon** for the campus. | • The staircase are expressed as a separate element in the facade, placed on diagonals of the square plan.<br>• **The free standing staircase** with concrete parapet - similar to staircase in Mill Owner's Association building by Le Corbusier in Ahmedabad. | • The overall plan of the building is a square, which is reflected in the roof.<br>• The stepped terraces seems to have been subtraced from a cube, with the addition of vaults.<br>• The traingular auditorium is embedded into the sqaure plan - facing one of the corners. |  | • The building is cladded with stone and the openings in the vault are covered with glass and act as skylights. - **introduction of new materials.**<br>• The form exploration deviates from the architectural language observes previously.<br>• **Contrasting rectilinear and curvilinear forms** (the stepped terraces and vaults respectively) are places together, but it is not subtle unlike the Museum of Life and Evolution . |
| 2. | **New OPD Block, PGIMER**<br>(1992-94)<br>Chandigarh | • The new OPD (Out Patient Department) block was build to accommodate the increse of patients in PGIMER.<br>• Service orientate building |  <br>  | • To create minimal circulation with out confusion for the ease of the patients.<br>• To create an enviroment for the patients that resonated **'kindliness, confidence and medical certinity'**. (Prakash, 2012) | • Use of **exposed concrete** (exterior now plasters and painted in red and white).<br>• **Circular openings for ventilation** - also seen earlier in Clubhouse for Golf Club, Chandigarh and Ammonium Perchlorate Experimental Plant, Alwaye.<br>• The building follows a grid of 20' x 20'.<br>• The **sculpturous porch** seems to be inspired by the porches designed by Pierre Jeanneret for Punjab University and Old Architect's Office.<br>• The **staircase** is expressed as a separate block on the facade. - but the form and treatment of staircase deviates from earlier works.<br>• Catering to the needs of the users. | • The building is made of 4 rectilinear volumes, rotated at 45°, connected through a common space in the center. **(4 Blocks)**<br>• Uppermost floor are projecting outwards to provide shading for the openings. | | • **Circular openings,** unlike seen before, are not made of concrete but are simple punctures in the walls.<br>• **Courtyards** become an important element in the building. Each block is provided with a courtyard and skylight. This is done to achieve the intended enviroment for the patients.<br>• Courtyards are also provided in the common spaces connecting the 4 blocks for natural light and ventilation.<br>Courtyards introduced as the scale of the building increases.<br>• The **staircase** are covered, althought the openings in the staircase block follow the form of the staircase- indicating its function from the facade<br>• **Vertical ducts** are places on the facade - they act as vertical louvers for the openings - appear as louvers, which was a shading device often used in the 'Chandigarh style' of architecture. |
| 3. | **National Institute of Pharmaceutical Education and Research**<br>(1992-94)<br>Mohali | • Institute for pharmaceutical education and research.<br>• Planning of the campus, as well as designing of the building was both done by Ar. Shivdatt Sharma. |  <br>  | | • This gap separates the **'skin'** and the **'structure'** of the building visually. - previously seen in his works during the first phase.<br>• The **front porch** of the Admin building leads to the staircase directly; this is used as an elements on the facade.<br>• The admin building is raised on **pilotis** - but the columns are octangonal and cladded with stone.<br>• The front facade of the Library uses **louvers as sun shading devices.** | • Both the Library block and Admin block use the cube for the form in different ways.<br>For the **Admin block**, two equal cubes are placed vertically and the cube on the top is rotate to 45°.<br>For the **Library block**, two cubes, one larger than other and placed with centers aligned giving a perfectly orthagonal form. |  | • The building is **cladded with two types of stone**; the red Dholpur stone frames the yellow sandstone - giving an expression of frame structure and in-fill walls.<br>• Introduction of **pergola** as ornamentation in his work- adding 'drama' to the building.<br>• Clear expression of the structure.<br>• The *pilotis* are not of the same height, some reach the first floor, and other reach the second floor. |
| 4. | **Advanced Eye Care Center, PGIMER**<br>(1999-2000)<br>Chandigarh | • Advanced Eye Care Center was designed to cater to eye ailments, and hence required a strict control of lighting. |  <br>  | | • Use of exposed concrete<br>• The **sculpturous porch** seems to be inspired by the porches designed by Pierre Jeanneret for Punjab University and Old Architect's Office.<br>It hints to the entrance of the Old Architect's Office. It also resembles the profile of an eye. (Prakash, 2012)<br>• The **staircase and ramp** are used are elements on the facade - iconic to this building.<br>A half-cylinder is placed on the facade which constitutes the ramp and staircase as a single unit - key feature of the building.<br>• The **services and staircase** are expressed as a separate block and as element respectively on the north-west facade.<br>• **Circular openings** used in the service blocks.<br>• Upper floors are projecting outwards and are lifted on columns - giving the expression of *pilotis*<br>• Structure of the building can be seen on the facade. | | | • The building is made out of exposed concrete, but its does not borrow the plasticity seen in Corbusier's work in Chandigarh.<br>• the facade of the lower floors is cladded with brick tiles.<br>• The fire- staircase on the north-west elevation is placed between 2 service block- **elaborate staircase acts as ornamentation** - different from the type of staircases seen in earlier works.<br>• Openings of the windows on the upperfloors are reccesed inside, instead of providing external shading devices.<br>• The overhang of the upper floors provides shading for the lower floors.<br>• Increase in complexity of the form.<br>• Decisions taken based on the brief - service oriented architecture. |

STRUCTURE
MATERIAL
SC
FORM
PORCH

### Phase I: The Early Phase

**Hostel at Art College**
(1963-65)
Chandigarh

**Faculty Guest House**
(1963-66)
Chandigarh

**Shri Guru Singh Sabha Gurudwara**
(1963-64)
Chandigarh

**Clubhouse for Golf Course**
(1965-67)
Chandigarh

**Museum of Life and Evolution**
(1965-67)
Chandigarh

### Phase II: Synthesis of the Influence

**Vikram Sarabhai Hall**
(1973-80)
Ahmedabad

**Ammonium Perchlorate Experimental Plant**
(1973-80), Alwaye

**Convent School**
(1992-93)
Chandigarh

**Pracheen Kala Kendra**
(1998-99)
Chandigarh

### Phase III: Towards a New Language

**Auditorium and Convention Center**
(1988-90)
Lucknow (SGPGIMS)

**New OPD Block, PGIMER**
(1992-94)
Chandigarh

**National Institute of Pharmaceutical Education and Research**
(1992-94), Mohali

**Advanced Eye Care Center, PGIMER**
(1999-2000)
Chandigarh



## Inferences from the case studies

**Phase I: The Early phase**

Sharma demonstrates a versatile use of the materials brick, stone and concrete, used exposed, following the language of the masters in Chandigarh closely. The monolithic brick approach in the housing projects, with jail walls, slit windows and sun-shading devices, reflects direct influence of Pierre Jeanneret. Elements like the ramp, free standing staircase, undulatory glazing, and the distinct expression of the 'skin' and 'structure' of a building, echoes Le Corbusier's design language.

The form of the building is a true expression of the structure, without any additional ornamentation. We see a clear expression of structure. The scale of the projects are smaller, and the projects appear to be more subtle and grounded.

**Phase II: Synthesis of the Influence**

For the service-orientated building at ISRO, Sharma innovates the architecture style of Chandigarh according to the requirements, context and available resources. The expression of the frame structure with in-fill walls, following a grid in plan and the use of *pilotis* is retained. The concept of *jali* wall is also retained, but the brick is replaced by hollow blocks. We also see the use of other Chandigarh's elements like the use of ramp, staircase and slit windows, but with a different approach. Later, we see a new approach towards brick as a material in his private practice. Solid forms with a mono-textural rendering becomes more evident. Pure geometrical forms are used, but with an experimental approach.

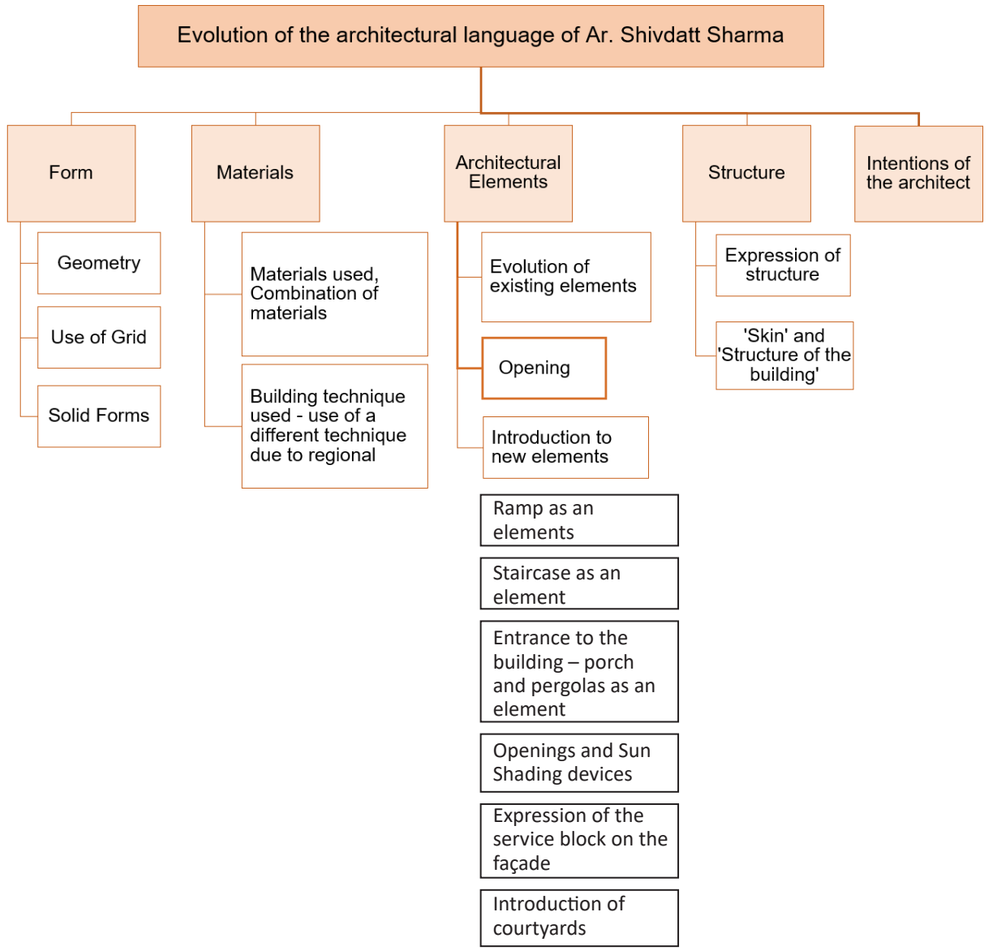
**Phase III: Towards a New Language**

In this phase, the scale of the project increases largely. As the scale of the project increases, Sharma's experimentation with form also increases, aiming for visual impact, often required by the client.

We see the use of pure geometric forms, but in a more fragmented manner, creating multiple blocks within the same project. Departing from the Chandigarh style of architecture, stone cladding replaces the exposed brick and concrete finish, yet the expression of the structure remain evident. Elements like the ramp and staircase become evident, but they are used with a newer approach in terms of materials, scale, placement and orientation and their type.

Chapter 7

# Framework for Analysis



Chapter 8

# Parameters of Analysis

## 8.1 Form

Ar. Shivdatt Sharma believes that for a building, it should have pure dimensions, or modular dimensions, or follow a grid, or a logic like the golden ration. It cannot be random. It has to be derived from a base unit. He believes that geometry is as important to architecture as rhythm is to poetry. His ideals of 'purity' and 'simplicity' can be seen through his use of pure geometrical forms.

**The Museum of Life and Evolution** (1965-67) consist of a perfect square plan with a regular circular cyclorama. The main building forms a cube, and the cyclorama is a cylinder which is embedded in this cube. The roof of the museum is kept a square, which maintains the overall expression of the museum as one cube. The cyclorama is designed to be a solid monolithic brick cylinder, devoid of any openings, to create a sculpture like form. The overall form of the building consists of pure geometric forms that are based on a perfect grid. The dimensions of this grid are derived from the **brick module.**

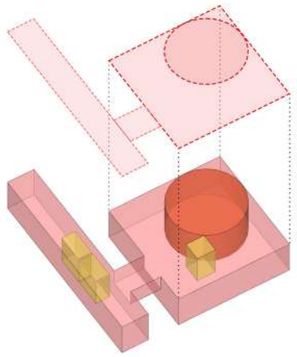


Fig 8.1.1 : Massing of the Museum showing the cube and cylindrical forms
*Source: by the author*

Fig 8.1.2: View of the cyclorama
*Source: by the author*

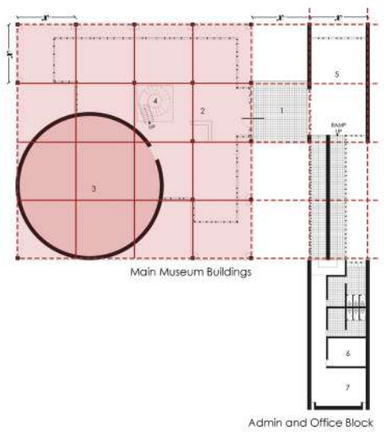



Fig 8.1.3: Diagram showing the grid on the Ground Floor plan of the Museum
*Source: by the author*



We see the experimental approach with geometrical forms in the **Vikram Sarabhai hall, Ahmedabad** (1973-80)**.** The hall is constituted of 3 equilateral of different sizes to accommodate different functions. This time of his career also provided him with a lot of creative freedom.

The use of cube as the primary unit to develop the form can be seen in his later projects evidently like the **Pracheen Kala Kendra** (1998-99) in Chandigarh and the **National Institute of Pharmaceutical Education and Research (NIPER)** building (1992-94) in Mohali. (Fig 8.1.7)

In Pracheen Kala Kendra, 2 cubes are used to develop the form. The ground floor and first floor are comprised of **2 cubes**, placed **edge to edge** - with the service block in between. **2 large columns** are places on the long side and one on the short edge.The second floor and third floor are also comprised of **2 cubes**, but they are **rotated at 45°,** and placed with **corner to corner**, with the services block in between. (Fig. 8.1.6) The **corners are chamfered**. **Columns** are aligned with the lower floor, and are places on the corners of the cubes. This is also seen in the HSIDC Office.

In the Admin building for NIPER, 2 cubes are placed concentrically, and one of the cubes is **rotated to 45°**, to achieve the form. Similarly, in the Library building for NIPER, two cubes, **one larger than other** and placed with centers aligned giving a perfectly orthogonal form.

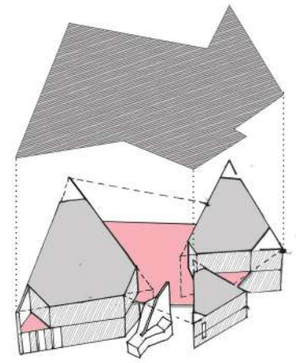


Fig 8.1.4 : Diagram showing the 3 equilateral triangles used in the museum
*Source: by the author*

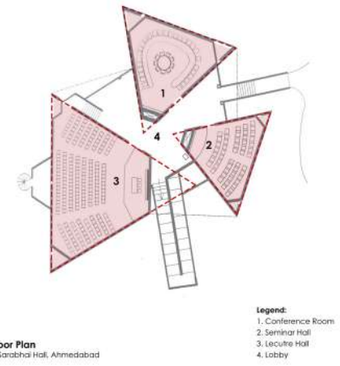



Fig 8.1.5: First floor plan showing the triangular geometry
*Source: by the author*

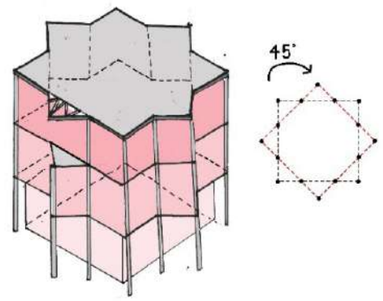



Fig 8.1.7: Diagram for the Admin block at NIPER, two equal cubes are placed concentrically and one of the cube is rotated 45°.
*Source: by the author*

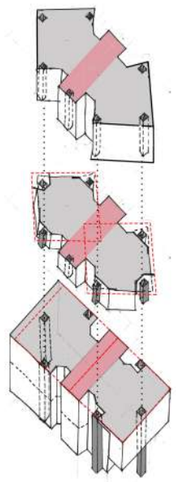


Fig 8.1.6: Diagram showing the placement of cubes in Pracheen Kala Kendra to obtain the form; The red depicts the service block.
*Source: by the author*

Fig 8.1.8: Front elevation of Pracheen Kala Kendra, Chandigarh
*Source: ©MATTER 2014*

Fig 8.1.9: View of the Administration block at NIPER, Mohali
*Source: (Prakash, 2012 p.123)*

Fig 8.1.10: View of the Library block at NIPER, Mohali
*Source: (Prakash, 2012 p.123)*

In his later stage, we see the **Cubist forms** become more evident, with the clear sharp rectilinear forms. The rotating and alignment of the mass creates a dynamic and complex form, making it visually appealing and innovative.

The form of the **Hostel for Art College** (1963-65), Chandigarh is devised from the intent to create a sense of community in the building, and as a response to the climate. The cross section of building, reflected on the front façade of the buildings brings the 'drama' to the building through the stepped pyramidal form. **Form used to respond to the climate, create a visually appealing building, and to create a thermally comfortable and interactive space for the users.**

**The Guest House(1963-66) at CSIO**, have form similar to the Hostel for Art College i.e. two rows of rooms or units are connected through a continuous corridor in the center, except it does not form the pyramidal form. The open balconies and stepped terraces seen on the façade are derived from the **intent to provide open spaces for all the users.**

Fig 8.1.11: Front elevation showing the pyramidal form
*Source: SDSA website*

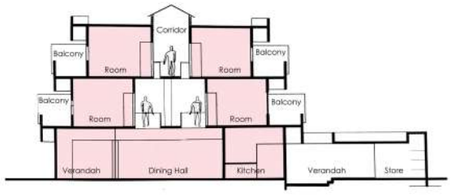



Fig 8.1.12: Cross section of the Hostel at Art College
*Source: (Prakash, 2012 p.29) – Diagram by author*


Fig 8.1.13: Cross section of the Hostel at Art College
*Source: (Prakash, 2012 p.29) – Diagram by author*



Fig 8.1.14: Elevation of the Guest House at CSIO, with the open balcony and terraces
*Source: SDSA website*

**The form of the Cafeteria (1963-66) at CSIO sets it apart from the rest of the campus as a visual landmark**. The cafeteria is a cylindrical building built in brick. The form is a result of the intent to create a visually appealing building that is set in the center of the campus. The method of contrast was employed for the same, creating a completely circular building among the other strict rectilinear buildings. It is also a cafeteria and hence the form also meant to achieve the casual sense of the function into the building.

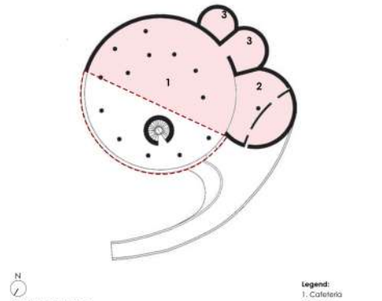



Fig 8.1.15: First Floor Plan of CSIO Canteen
*Source: (Prakash, 2012 p.34) – Diagram by author*

Services like store, kitchen and toilet are given in smaller semi-circles which are attached to the main cylinder. This part of the cylinder, with the attached service, is covered with bricks, and slit windows are provided. The other side of the canteen is kept completely open, with undulatory glazing creating a skin for the structure.

This creates a distinction between the **open and closed façade.** This apporach to openings can be seen in his later projects as well.

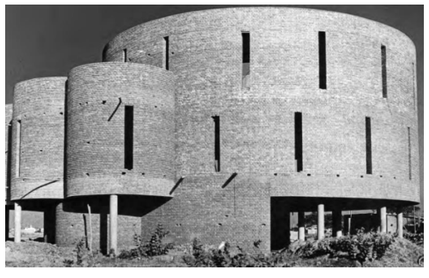


Fig. 8.1.17: View of the CSIO Canteen, showing the closed façade.
*Source: (Prakash, 2012 p.35)*

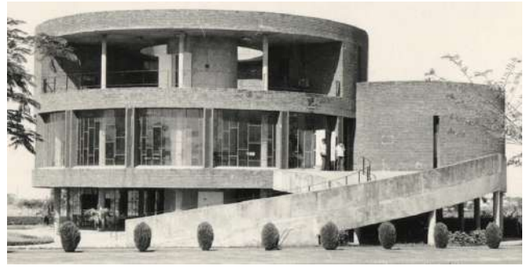


Fig. 8.1.16: View of the CSIO Canteen, showing the open façade with undulatory glazing
*Source: SDSA Website*

A similar approach to create a distinction between the open and the closed on the façade can be seen in his later project, the **Clubhouse for the Golf Course** (1965-67) near Sukhna Lake and the **Museum of Life and Evolution** (1965-67) in Leisure Valley. To achieve this distinction, the opening are articulated in a manner that a continuous plane i.e. the distance between 2 columns, is either kept a solid brick wall or covered with undulatory windows. We don't see 'punctures' into the walls, and the two (open and closed) are kept separate.

In the Museum, this distinction is also seen between the two floors. The ground floor is kept completely open, covered by undulatory windows, whereas the first floor is projecting outwards creating shading for the ground floor and covered with brick in-fill walls. The walls end at distance of approximately a feet from the column, creating slit openings.



*Fig. 8.1.20: View of the Museum of Life and Evolution, showing the open and closed distinction between the ground floor and first floor.*
*Source : Source: (Prakash, 2012 p.56)*

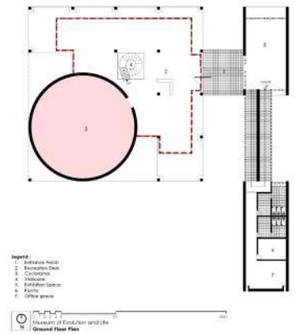



Fig. 8.1.21-a: Ground Floor Plan of the Museum showing the open façade
*Source: (Prakash, 2012 p.47) – Redrawn by author*

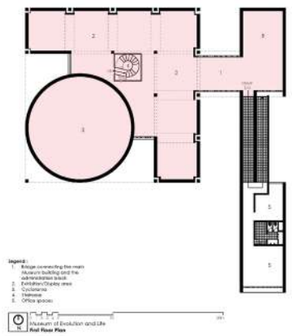



Fig. 8.1.21-b: First Floor Plan of the Museum showing the closed facade
*Source: (Prakash, 2012 p.47) – Redrawn by author*

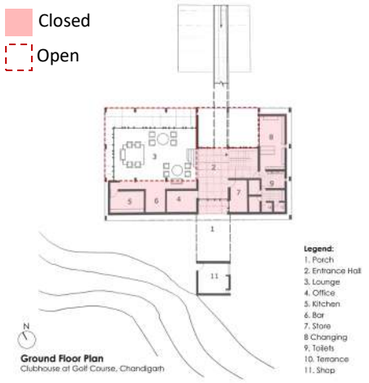




Fig. 8.1.18: Plan of Clubhouse for Golf Course, showing the open and closed façade.
*Source: (Prakash, 2012 p.47) – Diagram by author*

Fig. 8.1.19: View of the Clubhouse, showing the open and closed façade together.
*Source: (Prakash, 2012 p.44)*



In the **U.T. Guest House** (1965-66) at Sukhna Lake, we see balconies places at a 45**°,** angle from the main building. **This makes the building visually appealing**. We observe a similar distinction of open and closed in the façade as discussed above. Solid brick walls with minimal openings are used to create 'solid forms'. A similar massing with the balconies is also seen in the **Jammu & Kashmir Guest House** (1982-83), Chandigarh. The building is plastered and painted and uses vaults to span to match the architecture of the hills, but not literally.

Fig. 8.1.22: View of the Jammu & Kashmir Guest House
*Source: SDSA Website*

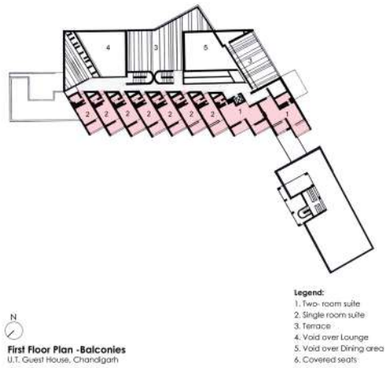



Fig. 8.1.23: First Floor Plan of the U.T. Guest House showing the placement of the balconies
*Source: (Bhatti, 2018 p.11) Diagram by author*


Fig. 8.1.24: First Floor Plan showing the placement of the balconies
*Source: (Bhatti, 2018 p.11) Redrawn by author*

Fig. 8.1.25: View of the balconies at the U.T. Guest House
*Source: Photo by author*

**The Gurudwara at sector 19** (1963), Chandigarh is an example where **form is derived directly from the structure**. The brief required Sharma to stray away from the traditional forms of a Gurudwara, hence this was Sharma's modern interpretation of a Gurudwara. The use of concrete as material provided him with the flexibility of the form. The form was inspired from the turban of the Sikh community. The three layer of arches define the structure as well as the profile for the Gurudwara.

Fig. 8.1.26: View during the construction of the Gurudwara (1963-65) – showing its structure
*Source: SDSA Website*

The span of the arches decreases as we go upwards, and each layer is rotated at 45°, so the base of the upper arch rests on the apex of the lower arch. These arches, could also be interpreted as abstracted domes. (Fig. 24)

Similarly in **the Auditorium and Convention Center** (1988-90) for the SGPGI in Lucknow, which is a much later project by Shivdatt Sharma, the form is derived directly from the function and structure.
The form is based on the requirements of the auditorium, where lesser volume is required towards the stage and it increases as we move toward the seating and then a balcony is added to the further end (Fig. 27). Hence we see the gradation of arches on the façade. The arches are trusses that are used for spanning, hence the truss becomes bigger as the span becomes bigger. The stepped terraces are added to cover the remaining building, other than the auditorium, to merge with the arches.


Fig. 8.1.29: Side Elevation of the Auditorium and Convention Center at Lucknow, showing the increasing mass towards the one end of the building.
*Source: (Bhatti, 2018 p.205) – Diagram by the author*

**The New OPD Block at PGIMER** (1992-94), Chandigarh, The building is made of 4 rectilinear volumes, rotated at 45°, connected through a common space in the center. This placement in the plan was done to provide easy way-finding and access to the patients. This same plan is reflected in the form as-is.
Uppermost floor are projecting outwards to provide shading for the openings. This can also be seen in the **Advanced Eye Care Center at PGIMER** (1996-2000),

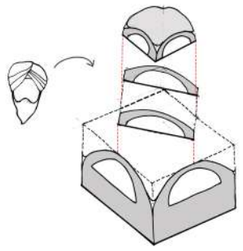


Fig. 8.1.27: Diagram showing the orientation of the arches.
Source: by the author

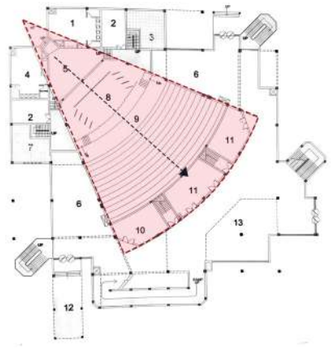


Fig 8.1.28: Plan showing the triangular Auditorium embedded in the square plan
*Source: (Prakash, 2012 p.131) – Diagram by author*

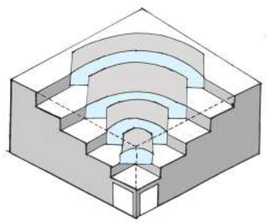


Fig 8.1.30: Diagram showing the massing for the Auditorium
*Source: by the author*

Fig. 8.1.31: Front elevation of the Advanced Eye Care Center, PGIMER, showing the upper floors projecting outwards, supported by columns
*Source: Photo by the author*



Chandigarh, where the upper floors are projecting outwards to provide shading to the lower floors.
**The form itself is used to create shading for the openings**, either through projection of upper flows, or creating recessed forms, as seen on the entrance of the **New OPD Block** in same campus of PGIMER. (1994-96)

Fig. 8.1.32: Front elevation of the New OPD Block, PGIMER, showing the recessed form of the building
*Source: Photo by the author*

**The National Institute of Plant Genome research (NIPGR)** (1999-2000), Delhi is a science research Institute, placed at the eastern edge of the Jawaharlal Nehru Campus. The site is a geographically complex site in Delhi, situated near the last intact green area of the capital. The campus is designed in a **fragmented form**, to adapt according to the site levels, and accommodate the various activities required, since a large structure would not fit into the levels of the site. (Fig 34.)
The building employs geometric forms to create clusters, with each cluster featuring a central courtyard. These courtyards serve as the central nucleus of the built environment, facilitating interaction and connectivity. It also provides natural light and air ventilation to the cluster. The huge pergolas are used not only as a shading device but also to unify the fragmented form of the building, so the form is expressed as one.

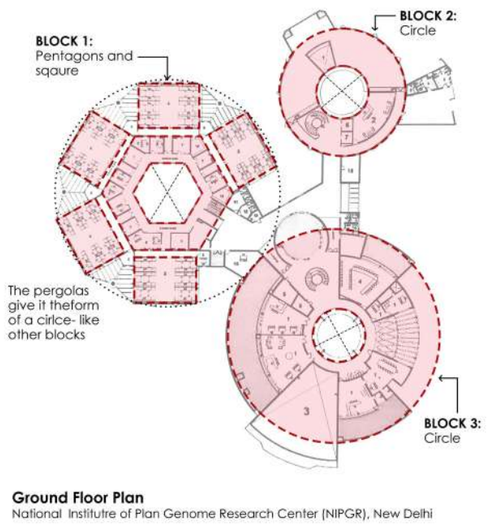



Fig. 8.1.33: Diagram of the ground floor plan of NIPGR showing the use of geometrical shapes and fragmentation in form
*Source: (Bhatti, 2018 p.102) – Diagram by the author*

**The Entrepreneur Development Center**, Chandigarh (2007-2009) represents a significant deviation from Shivdatt Sharma's language. The form has a bold, dominating and visually striking form. It designed to fulfill the project's brief, which called for an expression that would capture the attention of the entrepreneurs, hence the form is intended to look progressive and futuristic.

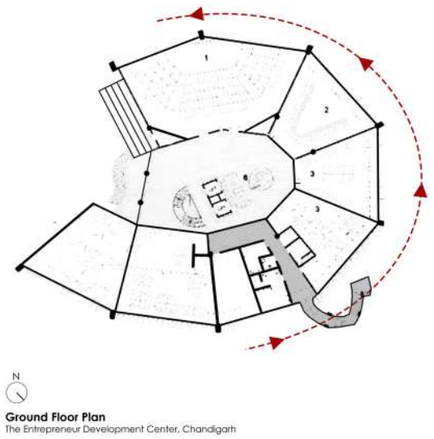



Fig. 8.1.34: Diagram of the ground floor plan of EDC showing the curvilinear overall form of the building.
*Source: (Bhatti, 2018 p.15) – Diagram by the author*

Fig. 8.1.35: Entrance of the EDC
*Source: (Bhatti, 2019 p.148)*

## 8.2 Material

Construction in Chandigarh was required to be fast, efficient and economical. For these reasons, materials like brick, stone and concrete were chosen as they were versatile and locally available. These 'old' materials were being used with new building techniques and new aesthetics. Efficient and optimal ways to use these materials were employed. There was also availability of skilled labour in India and the construction industry was largely manual- labour based, hence the buildings were designed in such a way to optimize on these factors.

Some of these methods could be seen in Pierre Jeanneret's housing:

1. Optimal use of brick in housing for all economic sections, since it was a locally available and cheap material, and labourer were familiar with the materials. Brick was used for:
   - Load bearing walls
   - *Jali* wall for ventilation
   - Parapets
   - Creating sun-breakers for openings
   - For in-built furniture like niches, cupboards and platforms
   - Outdoor pavement

   These were either kept exposed or plasters and painted white.

2. Use of locally available stone to create break the monotony of the brick in façade.
3. In most typologies, Pre-cast concrete battens were used to span over these walls for roofing. This resulted in faster construction and it was cost effective as it cut down the cost of shuttering
4. The opening were smaller, but larger in number and placed thoughtfully to optimize their use. They also expanded vertically than horizontally as the brick could be stacked vertically, but increasing the span horizontally would mean using longer lintels for spanning, which would increase the cost.



In his earlier phase, when Ar. Shivdatt Sharma is working as an architect in the Chandigarh Capitol Project (1959-1973) under the masters, we see the use of only these materials in is work; namely brick, concrete and stone.

### Chandigarh
### Brick, Concrete and Stone

In the **Hostel for Art College, Chandigarh** (1962), which is his first independent project as an architect in Chandigarh, we see the used of brick for load bearing walls. The beams, lintels and parapets are made of exposed RCC. Rubble stone masonary is used for the cafeteria to create curvilinear wall. Both concrete and brick are expressed distinctively on the façade. On the front façade, the brick wall expresses the pyramidal section of the building.

Fig8.2.1. The random rubble stone curvilinear walls for the cafeteria
*Source: (Prakash, 2012 p. 28)*

In the **Guest House for CSIO** (1963-65), we see the use of brick for load bearing walls, brick *jali* wall is used for ventilation and for parapet and brick is also used to make in-built niches and cupboards. Reinforced concrete beams are used for spanning and lintels.

> These are cladded with brick tiles, to maintain the overall **monolithic expression of brick** on the façade.


Fig. 8.2.4: Monolithic expression of brick on the side elevation of the Guest House for CSIO
*Source: (Prakash,2012 p. 40)*

Fig. 8.2.2: Front elevation showing section of the concrete elements used i.e. beams and slabs. The front porch is also in exposed concrete.
*Source: SDSA Website*

Fig. 8.2.3: Side elevation shows the concrete parapet, which gives the impression of large beams.
*Source: ©MATTER 2014*

**The Housing Type I for CSIO** (1963-66) was for the lowest category in the hierarchy of institutional staff. One large unit constituted of 5 smaller units, three on the ground floor and two on the first floor. Similar to the Hostel for Art College (1962), this building is also constructed of load bearing brick walls. The entire building is expressed in bricks, except the lintels and staircase on the front façade of the unit for the access to the first floor, which are in exposed concrete.

The project employs elements like brick sun breakers which were plastered and painted white, brick *jali* as parapet, and use of long vertical window, which are direct influences from the housing of Chandigarh designed by Pierre Jeanneret, Maxwell Fry and Jane Drew. (Fig 8.3.5).

Similarly for the **U.T. Guest House near the Sukhna Lake**, Chandigarh, the expression is entirely in brick, except the exposed concrete circular columns on the ground floor and concrete louvers. The beams and lintels are cladded with brick tiles to maintain the monolithic expression. The pattern of the brick changes on various intervals on the façade.

The above mentioned projects predominately see the influence of **Pierre Jeanneret.**

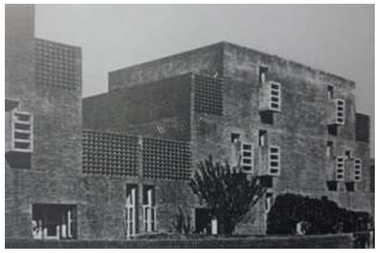


Fig. 8.3.5: Monolithic expression of brick on the side elevation of the Housing Type 1, with the sun breakers.
*Source: (Prakash,2012 p. 38)*

Fig 8.3.6: Elevation of the U.T. Guest House in brick, lifted on concrete columns; monolithic and solid forms.
*Source: Photo by author*

Fig 8.2.8: Concrete louvers at the U.T. Guest house, solid monolithic brick facade
*Source: (Prakash, 2012 p.50)*

Fig. 8.3.7: Entrance to the U.T. Guest house
*Source: Photo by author*

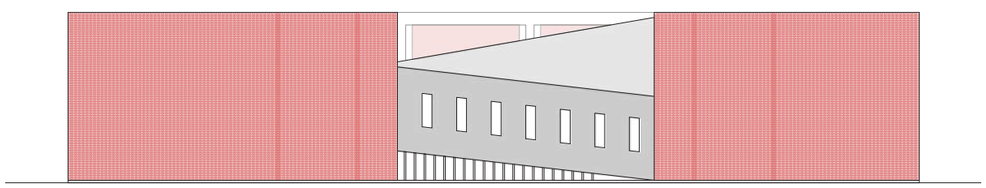


Later projects, like the **Club House for Golf Course** (1965-67) and the **Museum of Life and Evolution** (1965-67), showcased influences from Le Corbusier's language of brick and concrete. The frame structure of the building is clearly visible in exposed concrete. The columns extend all the way to roof from the plinth, uninterrupted.

Fig 8.2.9: Front Elevation of the Clubhouse at Golf Course; Illustration showing the uninterrupted columns, extending to the roof
*Source: SDSA Website – Diagram by author*

Fig 8.2.10: Front Elevation of the Museum of Life and Evolution; Illustration showing the uninterrupted columns, extending to the roof
*Source: (Bhatti, 2018 p.264) – Diagram by the author*

In the Museum of Life and Evolution, Shivdatt Sharma showcased an innovative blend of the two expression of brick and concrete discussed above and his own ideas. The administration block and cyclorama are predominantly expressed in exposed brick masonary. However, Sharma introduced a distinctive element by incorporating an exposed concrete ramp in the east façade of the building. This ramp, unlike Le Corbusier's free-standing open ramps, had vertically oriented openings, creating a visual contrast with the rest of the exposed brick structure (Fig. 8.2.11). In the main museum building, the frame structure of the buildings and the edge-to-edge stacking of the bricks, are similar to the **Government Museum and Art Gallery by Le Corbusier** in the same complex (Fig 8.2.13). This gives two distinct characters to the Admin building and the main museum building.



East Elevation

Fig 11: Concrete ramp on the east elevation of the Museum of Life and Evolution
*Source: Drawn by the author*

Fig. 8.2.12: Brick pattern in the Museum of Life and Evolution
*Source: by the author*

Fig. 8.2.13: Brick patter in the Government Museum and Art Gallery by Le Corbusier
*Source: © Kai K Gutschow*

## Ahmedabad
### Brick and Concrete

**The Vikram Sarabhai Hall (1973-80) in Ahmedabad** is built in the 'Chandigarh style' language of brick and concrete, with the clear expression of structure in exposed concrete and in-fill walls in brick. Although newer elements are introduced. For example: The brick columns on the ground floor.

Fig. 8.2.14: View of the Vikram Sarabhai hall, showing the brick columns on the ground floor
*Source: ©MATTER 2014*

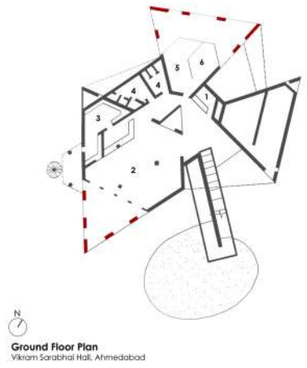



Fig. 8.2.15: Ground Floor Plan showing the placement of the brick columns.
*Source: (Prakash, 2012) - redrawn by the author*

## Southern Regions of India
### Concrete, pre-cast blocks, locally available material

While working for ISRO, from 1973-1979, Shivdatt Sharma built in the southern region of India, like Bangalore, Thumba, Alawaye, Nicobar etc., where the land was available and secluded to build the space facilities of ISRO.



Unlike the north, it wasn't a common practice to build with brick in these locations. The laborer were also not well equipped with brick construction.

> Sharma had to adapt himself to use the **locally available materials**, or materials that would be **easy to build** with in remote areas with **little resources and low-skilled laborers.**

**The Pressure transducer Unit** (1973-80) near Bangalore, concrete frame structure is used with hollow and solid fly ash bricks of the same dimensions for the in-fill walls. The blocks make a pattern on the façade, which accounts for the minimum ornamentation on the building, also providing control on intake of light and air. (Fig. 8.2.16)

Fig. 8.2.16: Concrete frame structure with pre-cast blocks in-fill wall at the Pressure Transducer Unit
*Source: (Prakash, 2012 p.84)*

Similarly in the **Ammonium Perchlorate Experimental Plant** (1973-80), concrete frame structure is used with in-fill walls, all materials used exposed. Pre-case hollow blocks are used on the ground floor for ventilation and brick is used for infill walls on the first floor. The building is designed with a grid plan that derives its dimension from the brick module. The concrete shell structure used for spanning was modular and precast. (Fig. 8.2.17)

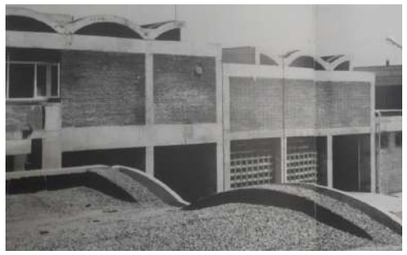


Fig. 8.2.17: Concrete frame structure with brick and hollow block at the Ammonium Perchlorate Plan
*Source: (Prakash, 2012 p.78)*

**These hollow blocks used for ventilation and natural light control can considered the replacement of the brick *jali* wall seen in the earlier works of Shivdatt Sharma, used for the same purpose.**

The use of locally mined Laterite and Grate stone can be seen in the **VSSC Central School** (1973-80) at Bangalore. The stone is used for the load bearing rubble masonary walls of the school, and concrete is used for spanning and roof structure.

Fig 8.2.18: The VSSC Central School made with stone rubble masonary, with a concrete roof
*Source: ©MATTER 2014*

Fig 8.2.19: Entrace to the school, with wooden shuttered windows
*Source: (Prakash, 2012 p.85)*

## Chandigarh
### Brick

The use of brick as a predominant material can be seen again in Sharma's work when he returns to Chandigarh and Panchkula to start his own private practice in 1980. A clear monolithic expression of brick can be specifically seen in three projects, the **Tribune Model School** (1998-99), the **Auditorium for Carmel Convent School** (1992-93) and **Pracheen Kala Kendra** (1998-99). In these projects, we see that the entire building is expressed in exposed brick, creating a monolithic and monotextural expression of brick, similar to that seen in his early works. The expression of concrete is limited to the columns and occasionally lintels. This expression is more similar to the Museum of Life and Evolution, where brick is used to express solid forms like the cyclorama. This is expression is used as method to achieve the architect's intention of a sculpture-like architecture.

Fig. 8.2.20: Auditorium for Carmel Convent School
*Source: (Prakash, 2012 p. 92)*

Fig. 8.2.21: Pracheen Kala Kendra
*Source: ©MATTER 2014*

Fig. 8.2.22: Image of the Tribune Model School, showing the monolithic expression of brick, with an exception of louvers and 'scoops'
*Source: SDSA website*

**In his later works, we do not see the prevalent use of *jali* walls or sun breakers over smaller windows. We also don't often see the use of various patterns in bricks on the façade, like seen in the U.T. Guest,** except in residential projects like in **Dr. Amod Gupta's Residence** (2003-04) in Panchkula.

Fig. 8.2.23: Use of brick jali wall in Dr. Amod Gupta's Residence
*Source: (Prakash, 2012 p.164)*

## Later Projects
### Exterior Cladding

Stone cladding on the exterior façade of the building can be seen in his later projects. In an interview, Sharma mentions that his decision for stone cladding was based on two factors; one, that the quality of the brick had decreased over time and it cannot be used exposed, two, that the use of other sustainable materials like fly-ash bricks, aluminum blocks etc. is promoted since they are economical and more sustainable as compared to brick, but they also cannot be left exposed as they are very porous and need to be cladded.

Hence locally available stones is used for cladding in his later projects like the **National Institutes of Pharmaceutical Education and Research** (1992-94), Mohali and the **Auditorium and Convention Center at SGPGI** (1988-90), Lucknow.

Fig. 8.2.24: Entrance to the Auditorium and Convention Center at SGPGI, Lucknow
*Source: SDSA Website*

Although the buildings at NIPER are cladded in stone, it is done with an intention to express the frame structure and in-fill wall separately, as seen in his exposed brick and concrete building.

Fig. 8.2.25: Front façade of the Library building at NIPER
*Source: (Prakash, 2012 p. 123)*

Fig. 8.2.26: Stone cladding on the Administration building at NIPER.
The darker stone gives an expression of a frame structure and the light stone of an in-fill wall
*Source: (Prakash, 2012 p. 122)*

The use of concrete as predominate material can be seen in the three buildings designed by Sharma for Post Graduate Institute of Medical Education and Research (PGIMER) at Chandigarh, namely **The New OPD Block** (1992-94) and **The Advanced Pediatric Center** (1994-96), **The Advanced Eye Care Center** (1996-2004).

But the language is different as compared to his earlier works. It is also because these buildings were large in scale and service centric. They have less of a 'sculpture' like look because of the same reason, since it had to be program based, unlike the museum and auditoriums designed by him earlier.

In his later projects like the Advanced Eye care Center, we see the use of exposed concrete, not just for the structure but also for the walls and brick tile cladding.

> But unlike his earlier works, **the two materials are used in two separate areas of the façade, instead of being used together, or individually.** We do not see the two materials being blended in one singular area of the building.

For example- The columns, façade of the upper floors, and porch of the buildings are exposed concrete, whereas the façade of the ground floor and first floor, except the service block are cladded in brick tiles with various patterns (Fig. 28). Here, brick is used as ornamentation and not as an expression of structure.

**We see the evolution of brick from being used as structure to it being used as ornamentation only.**

Fig. 8.2.27: North-west façade of the building showing the material distinction
*Source: (Prakash, 2012 p. 103)*

Fig. 8.2.28: Front façade of the Advanced Eye Care Center
*Source: Photo by author*

Fig. 8.2.29: Patterns formed by brick tiles on the front façade
*Source: By author*



New Materials

## Bamboo

**The Bamboo Museum** (2010-11) in Palampur is a unique project designed by Sharma using Bamboo. He had used bamboo previously to build sheds during his time in ISRO, but it was different for the museum since the scale was much larger as compared to sheds and he was using only Bamboo as a material to build. Hence the materials had been tried to be used in all forms in the building. It is used to span horizontally, vertically, as columns and beams. Bamboo mats were used for the interior and exterior covering.

Fig. 8.2.30: Interior of the museum, use of different types of bamboo mats for the ceiling and the walls
*Source: TheBetterIndia (Menon, 2017)*

Fig. 8.2.31: Bamboo Museum at Palampur
*Source: SDSA Website*

Fig. 8.2.32: Use of bamboo to create structural members, covering walls and frames for windows
*Source: TheBetterIndia (Menon, 2017)*

Sharma believes that it is important for an architect to be versatile and open to using the locally available materials and not be limited to using only bricks, concrete and stone.

> “The architect should be very innovative in trying to use the local material, local facilities, local skills. And all you want is you want to find the answers. You should try something which becomes a very innovative answer to the questions there.”
>
> *- S. D. Sharma (2024)*

## 8.3 Architectural Elements

### Ramp as an elements

The ramp was a key element in the architectural vocabulary of Le Corbusier. One such example of the use of ramps can be seen in the **Mill Owner's Association Building (1954)** in Ahmedabad, where the straight ramp, with a concrete and a steel parapet, is aligned perpendicular to the building, jutting outward (Fig 8.3.1).

Fig. 8.3.1: Ramp at the Mill Owner's Association Building, Ahmedabad
*Source: architecture-history.org*

Sharma mentions that he uses ornamentation in his work, but it is not applied, neither is it through the historical borrowings of *chajjas, chatris*, domes and arches, but rather thought architecture elements like ramps and staircases. Staircases and ramps, when placed on the façade, acts as a connection between the inside and the outside, as one can see the activity going inside the building and it gives a sense of participation even when it is being observed from the outside.

In the **Clubhouse for the Golf Course** (1965-67) at Sukhna Lake, the ramp with the concrete and steel parapet, placed perpendicular to the facade, extending outward, echoes Le Corbusier's aesthetic. Similarly, in the **CSIO Cafeteria** (1963-66) Chandigarh, the curvilinear ramp on the front facade complements the cylindrical form of the building, standing out as a distinct architectural element, having an identity of its own.

Fig. 8.3.2: Circular ramp at the CSIO Canteen and Guest House
*Source: ©MATTER 2014*

Fig. 8.3.3: Front Elevation with ramp of the Clubhouse at Golf Course, near Sukhna Lake
*Source: SDSA Website*



In contrast, the **Museum of Life and Evolution** (1965-67), in the leisure valley of Chandigarh, features a more subtle expression of the ramp. The exposed concrete ramp is placed between 2 exposed brick monolithic blocks, integrated into the overall form of the building, unlike the examples discussed above. The material and form of the ramp make it a distinctive element on the façade.

The **Vikram Sarabhai Hall** (1973-80), Ahmedabad features a free-standing ramp, positioned as a separate block on the facade and constructed in concrete. It resembles the ramp at **City Museum** (1969-70), Chandigarh, which is situated in the same campus as the **Government Museum and Art Gallery by Le Corbusier** and the **Museum of Life and Evolution** designed by Sharma himself.

However, the parapet and the profile of the center concrete wall sets the ramp apart from its precedent. This closed concrete ramp, used in the City Museum, Chandigarh, where Sharma largely contributed as part of the design team, was inspired from the **Maison de l'Homme (1960-67) in Zurich by Le Corbusier**.

All the primary functions are situated on the first floor of the building. The ramp at Vikram Sarabhai Hall directs attention towards the entrance on the first floor, emphasizing its significance and highlighting the function.

The ramp at the **Ammonium Perchlorate Experimental Plant** (1973-80) in Alwaye is placed as a part of the building merged with its material pallet. While serving its function, the ramp adopts a more understated approach, reflecting the building's pure service and function-oriented design.

Fig. 8.3.4: Maison de l'Homme in Zurich by Le Corbusier
*Source: fondationlecorbusier.fr*
*© FLC / ADAGP*

Fig. 8.3.5: City Museum, Chandigarh
*Source: Picture by the author*

Fig. 8.3.6: Ramp at the front elevation of the Vikram Sarabhai Hall, Ahmedabad
*Source: (Prakash 2012, p.67)*

**Notably, in Sharma's later works, the free-standing concrete ramp becomes less prevalent. The ramp is either integrated into the building's design or absent altogether, reflecting a shift in the architectural expression over time.**

## Staircase as an element

The **Housing type I at CSIO** (1963-66), Chandigarh, was designed for the lowest category in the hierarchy of the institution staff. It features an independent staircase is provided on street facing façade of the building for the separate access to the first floor. Contrasting with the exposed brick structure, the concrete staircase creates a clear distinction. This can be seen as direct influence from the **Housing type 13-J** (1961) designed by Pierre Jeanneret for the lowest income group in Chandigarh.

Fig 8.3.7: Housing type I at CSIO, designed by Shivdatt Sharma
*Source: (Prakash 2012, p.36)*

Fig 8.3.8: Housing type 13-J (Double Storeyed) designed by Pierre Jeanneret
*Source: Canadian Centre for Architecture*

Similarly, in the **Faculty Guest House at CSIO** (1963-66), the staircase, although a part of the building, appears separate due to material and massing changes, deviating from the otherwise uniform design.

Fig. 8.3.9: Façade of the Faculty Guest House at CSIO
*Source: (Prakash, 2012 p.40)*

**Unlike ramps, Sharma's use of staircases as bold statements on facades emerged later in his career.**



In the **Auditorium and Convention Center at SGPGI** (1988-90), Lucknow, the free standing staircase is not used as a prominent element on the façade, instead it is hidden inside the pre-dominant cube form of the building to maintain the geometry.

In the **Admin building at NIPER** (1992-94), Mohali, the linear staircase projects outwards of the singular mass of the building, which is a cube, to make a statement. In the **Library building**, the staircase which are the same width as the elevation of the building, are placed on the front elevation and leads to the raised entrance plinth of the building.

Fig. 8.3.10: Staircase at the Auditorium and Convention Center at SGPGI
*Source: (Bhatti, 2018 p.2.5)*

Fig. 8.3.11: Staircase at the entrance of the Admin building at NIPER
*Source: (Prakash, 2012 p.122)*

Fig. 8.3.12: Staircase at the entrance to the Library building at NIPER
*Source: (Prakash, 2012 p.123)*

In **Advanced Eye Care Center, PGIMER,** (1996-2000) Chandigarh, the concrete fire exit staircase on the façade comes out as a distinct element. It is the result of the requirement of a **fire exit** in a hospital, but it is designed to be consistent to the symmetry, massing and material palette of the building.

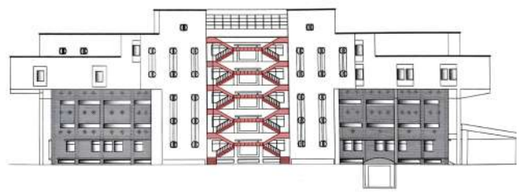


Fig. 8.3.13: North West elevation the Advanced Eye Care Center highlighting the fire-staircase on the facade, PGIMER
*Source: by the author*

Fig. 8.3.14: Elevation showing the fire-exit staircase on the façade
*Source: (Prakash, 2012 p.103)*

Furthermore, innovative design is evident in the combination of ramps and staircases, where the two have been combined together in a semi-circular form. The dog-leg staircase is set in the center and the ramp wraps around it in a semi-circular manner. Although it is not openly placed on the façade, the semi-circular form covered with glass, attached to the otherwise rectilinear building makes it a distinct element of the building.

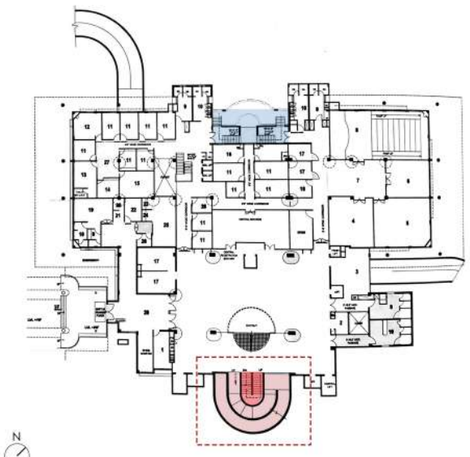



Fig 8.3.17: Ground Floor Plan of the Advanced eye Care Center, showing the ramp and the staircase on the South-East façade of the building, and the fire exit at the North-West façade.
*Source: (Prakash, 2012 p. 104)*

Fig. 8.3.15: Semi-circular ramp and staircase; exterior view
*Source: PGIMER Website*

Fig. 8.3.16: Semi-circular ramp and staircase; interior view
*Source: Photo by the author*

The **DLF Shopping Complex in Qutub Enclave** (1989-92) at Gurgaon features a stand-alone staircase, designed for fire-exit, adjacent to the parking, near the entrance of the complex. The unusual plan of the staircase gives it a striking form. It is supported by large columns that extend all the way to the top without interruptions. The staircase, with is its solid parapets, columns and the height it is extended to, gives it a monumental look.

Similarly, in the **Entrepreneur Development Center (EDC)** (2007-2009), Chandigarh, the fire-exit staircase is placed on the façade of the building. It is given a curvilinear form to blend in with the form of the building. The staircase add to the sculpture-like expression of the building. The ramp and the staircase are placed together, contributing to the dynamic and dramatic aesthetics of the building.
While they do compliment the building, they also stand out as distinctive elements as their own.

Fig. 8.3.18: Fire exit at the DLF Shopping Complex
*Source: (Bhatti, 2018 p. 127)*

Fig. 8.3.19: Fire exit at the DLF Shopping Complex
*Source: (Prakash, 2012 p. 151)*

Fig. 3.8.20: Fire exit and ramp at the EDC
*Source: (Bhatti, 2018 p. 153)*

## Entrance to the building – porch and pergolas as an element

**The utilization of porches as sculptural elements** is seen in the architectural language of **Pierre Jeanneret**, evident in buildings like the **Old Architect's Building and at Punjab University[12].**

Fig. 8.3.21: Entrance Porch at the Old Architect's Office, designed by Pierre Jeanneret
*Source: Photo by the author*

Fig. 8.3.22: Aministration building at Punjab Engineering College, Chandigarh - designed by Peirre Jeanneret
*Source: © SARBJIT SINGH BAHGA & ARUN MIRCHANDANI mid 1850s)*

Fig. 8.3.23: Display of different porches at designed by Pierre Jeanneret for Punjab University, at the Pierre Jeanneret Museum in Chandigarh
*Source: Photo by the author*


Fig. 8.3.24: A.C. Joshi Library at PunjabEngineering College, Chandigarh- designed by Peirre Jeanneret
*Source: official_acjoshilibrary @ instagram*

This is also seen in the three buildings that Sharma designed for the **Post Graduate Institute of Medical Education & Research** (PGIMER) in Chandigarh. In the **New OPD Block** (1992-94), the porch is given a curvilinear form with sculpture-like columns, contrasting to the straight rectilinear form of the building. The **Advanced Pediatric Center** (1994-96) feature a porch supported on rounded corners. Above the porch, curvilinear paths

12. Talked about the use of porches in the Punjab University by Pierre Jeanneret in the display in the Pierre Jeanneret Museum in Chandigarh, visited by the author.



are incorporated on the façade, linking two blocks in the building. This addition serves both aesthetic and functional purposes, as it introduces visual complexity and breaks the monotony of the building's otherwise straight, linear and sharp form. In the **Advanced Eye Care Center** (1996-2000), the front porch is reminiscent of an eye, and the porch at the Old Architect's office.

The **Pergola as an element,** emerges much later in Shivdatt Sharma's architectural language.

Fig. 8.3.25: Entrance porch of the Advanced Eye Care Center, PGIMER
*Source: Photo by author*

Fig. 8.3.27: Entrance porch of the New OPD Block, PGIMER
*Source: Photo by author*

Fig. 8.3.26: Entrance porch of the Advanced Pediatric Center, PGIMER
*Source: Photo by author*

In the administration building at **National Institutes of Pharmaceutical Education and Research** (1992-94), Chandigarh, a triangular pergola, formed by a cube protruding from another, makes a distinctive architectural statement. **It is used to break the monotony of the form.** (Fig. 28)

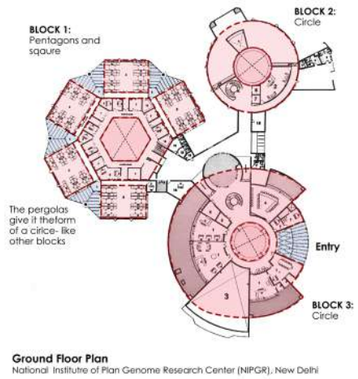
Fig. 8.3.28: Pergola at the Admin building at NIPER)
*Source: (Prakash, 2012 p. 121)*

**The National Institute of Plant Genome Research (NIPGR) Center** (1999-2000), New Delhi consists of 4 block, two of which are circular. The other two are hexagons at the core, and a square is aligned and attached to each side, creating a flower-like formation. A pergola is used to fill these 'gaps' between the squares. It is placed between the two adjacent edges of the square, making it similar to the circular blocks of the institution. Here, **the huge pergolas are used to give a comprehensive look to the form.**

**The pergola has also been used as an entrance element at NIPGR.** (Fig 8.3.31)

Fig 8.3.31. Image showing the pergola used at the entrance of the NIPGR building
*Source: NIPGR Website*

Fig. 8.3.29: Pergola between 2 block at NIPGR
*Source: (Bhatti, 2018 p.111)*




Geometrical Forms in Plan
Pergola in Plan

Fig 8.3.30. Image showing the pergola used at the entrance of the NIPGR building
*Source: NIPGR Website*

This is also seen in the **Haryana State Industrial Area Development Corporation LTD (HSIDC)** (1991-92), Panchkula. The 2 formal entrances are places on the opposite facades of the building, between two larger volumes. These entrances are recessed inside and the two volumes are tied together with the pergola. The pergola creates a semi-open space and adds grandeur to the entrance. (Fig. 8.3.32)

Fig. 8.3.32: Pergola at the entrance of HSIDC
*Source: ©MATTER 2014*


Geometrical Forms in Plan
Pergola in Plan

Fig. 33. Diagram showing the geometrical patterns in the plan and the pergola used.
*Source: (Bhatti, 2018 p.139)*



The use of entrance element becomes more prominent in the **DLF Shopping Arcade** (1991-92), New Delhi, where a space frame is used to span over the entrance. The elevated entrance is placed between 2 blocks, and opens to a central courtyard.

The **Entrepreneur Development Center** (2007-2009) in Chandigarh stands out as one of Shivdatt Sharma's most monumental and dramatic architectural creations. Central to its design is a striking pergola of grand proportions, which wraps around the building, starting from the roof and descending downwards. Supported by large, stand-alone, sculpture like columns that extend from ground to roof, these elements stand apart from the building itself. They impart a visually imposing expression.

On a smaller scale, the pergola is used in residential projects like **Dr. Amod Gupta's residence** (2002-2003) and **Architect's own residence** (1990-91). The pergola is used to provide shading on the open terraces and balconies.

Fig. 8.3.34: Space frame at the entrance of the DLF Shopping Arcade

Fig. 8.3.35: Pergola at the Entrepreneur Development Center
*Source: (Bhatti, 2019 p.148)*

*Fig. 8.3.38: Architect's Own Residence; pergola over the balcony facing the entrance.*
*Source: (Bhatti, 2019 p. 42)*

Fig. 8.3.36: Pergola descending downwards

*Fig. 8.3.39: Architect's Own Residence; pergola over the balcony facing the entrance.*
*Source: (Bhatti, 2019 p. 45)*

*Fig. 8.3.37: Dr. Amod Gupta's Residence; pergola over the balcony facing the entrance.*
*Source: (Bhatti, 2019 p. 22)*

## Openings and Sun Shading devices

The **undulatory glass surface** were a key element in the architectural vocabulary of Le Corbusier. It can be seen in the Government Museum and Art Gallery by Le Corbusier in the Leisure valley at Chandigarh. It also becomes a recurring element in the works of Shivdatt Sharma. He prominently uses it in his projects in Chandigarh, namely the **Canteen at CSIO** (1963-66)**,** the **U.T. Guest House** (1965-66), **Museum of Life and Evolution** (1965-67), which is in the same complex as the Government Museum by Corbusier, and the **Clubhouse for Golf Course** (1965-67).

Fig. 8.3.43: Front Elevation of the Clubhouse at Golf Course, near Sukhna Lake
*Source: SDSA Website*

Fig. 8.3.40: Canteen at CSIO
*Source: ©MATTER 2014*

Fig. 8.3.41: Entrance to the U.T. Guest house
*Source: Photo by author*

However, **the use of undulatory glazing is only limited to his work during his tenure as an architect in the Chandigarh Capitol Project team until 1973.** It is not seen in his later works.

The U.T. Guest House also features concrete louvers along with the undulatory glazing, a direct influence of Le Corbusier. However, they are placed in staggering formation on the façade, deviating from Corbusier's typical grid arrangement.

Fig. 8.3.42: Museum of Life and Evolution' Exterior and interior views
*Source: Photos by the author*

Fig 8.3.44: Concrete louvers at U.T. Guest House
*Source: (Prakash, 2012 p.50)*



Abstraction of these vertical louvers can be seen in his much later work at **National Institutes of Pharmaceutical Education and Research** at Chandigarh (1992-94), where the louvers are used on the front façade of the Library building, in a grid, and cladded with stone like the rest of the building. It becomes the identity of the façade.

The use of concrete pipes on the exposed brick façade for ventilation are seen in the **U.T. Guest House** (1965-66) and the **Clubhouse for Golf Course** (1965-67). They are also seen on the boundary wall of the Gurudwara at Sector 19, but here they are arranged linearly at regular distances.

Fig. 8.3.47: Circular openings at the Clubhouse for Golf Course
*Source: (Prakash, 2012 p.46)*

Fig. 8.3.45: Front façade of the Library building at NIPER
*Source: (Prakash, 2012 p. 123)*

Fig. 8.3.46: Circular openings at the U.T. Guest House
*Source: (Prakash, 2012 p.48)*

Circular openings with a concrete framing, on solid exposed brick façade in the **Ammonium Perchlorate Experimental Plant** (1973-80), Alawaye. The openings are larger in scale, placed at equal intervals and serve the purpose of ventilation. (Fig. 8.3.49)

In the **Advanced Eye Care Center at PGIMER,** Chandigarh (1996-2000), circular openings serve as ventilators specifically on the toilet block, forming a grid pattern on the façade. Other than ventilation, this feature also offers a unique expression to the services on the façade. In the same campus, t**he Advance Pediatric Center** (1994-96) also uses the circular openings for a similar function. The openings are placed on the walls of the ramp block that is placed protruding outside the main building mass.

Fig. 8.3.48: Circular openings at the Ammonium Perchlorate Plant
*Source: (Prakash,2012 p. 38)*

Fig 8.3.49: Circular openings on the toilet block in the Advanced Eye Care Center
*Source : (Prakash, 2012 p.103)*

In the **Housing type 2/3/4 for CSIO** (1963-66), Chandigarh, sun –**shading devices,** which were also used by Pierre Jeanneret in his housing for Chandigarh, are used on the façade. However, in his later project, **Pracheen Kala Kendra** (1998-99) also in Chandigarh, Sharma elevates the scale and proportion of the sun-shaders, making them into iconic façade elements that not only provide shade but also enhance the building's visual appeal.

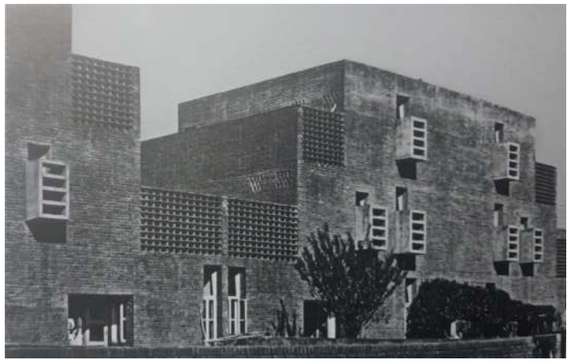


Fig. 8.3.50: Elevation of the Housing Type 1 with the sun breakers.
*Source: (Prakash,2012 p. 38)*

Fig. 8.3.51: Front elevation of Pracheen Kala Kendra, Chandigarh
*Source: ©MATTER 2014*



## Expression of the service block on the façade

In the **Pracheen Kala Kendra** (1998-99) Chandigarh, the service block is placed between two cube masses, protruding outward and expressed distinctly on the façade.

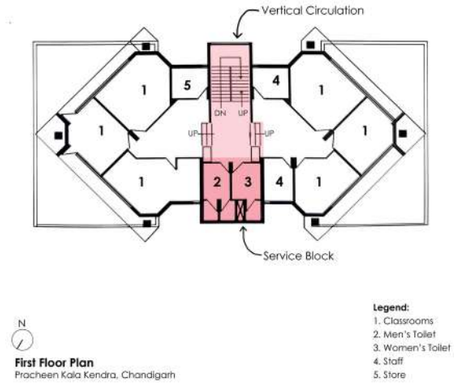
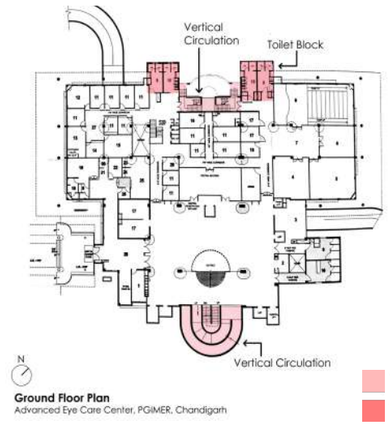



Fig. 8.3.52: Diagram showing the service block in the First Floor Plan at Pracheen Kala Kendra
*Source: (Prakash, 2012 p.91) – diagram by the author*

Vertical Circulation
Toilet Blocks

Fig. 8.3.53: Image showing the service block in the Elevation at Pracheen Kala Kendra
*Source: ©MATTER 2014 - diagram by the author*

In **Advanced Eye Care Center at PGIMER** (1996-2000), the toilet block is stacked from the ground floor to the topmost floor, protruding outward from the rest of the building. Circular openings are incorporated into its design to serve as ventilators, and it is expressed distinctly on the façade along with the fire exit staircase.




Vertical Circulation
Toilet Blocks

Fig. 8.3.54: Diagram showing the service block in the Ground Floor Plan at Advanced Eye Care Center
*Source: (Prakash, 2012 p.104) – Diagram by the author*


Fig. 8.3.55: Image showing the service block in the Elevation at Advanced Eye Care Center
*Source: (Prakash, 2012 p.103) – Diagram by the author*

The **Advance Pediatric Center, PGIMER** (1994-96), Chandigarh features a ramp, encased in a concrete wall with circular openings, protruding outwards from the building, as a separate. The ducts protrude from the form of the building as channels that run from the ground floor all the way to roof, as horizontal façade elements.

The use of ducts or services as façade elements is also seen in the **New OPD Block** (1992-94) in the same campus.

In the **Auditorium for Carmel Convent School** (1992-94), Chandigarh, the staircase block projects outward from the corners of the plan at a 45-degree angle and is clearly expressed in the elevation. The staircase block is provided with a stylized opening, contrasting to the solid form of the rest of the building.

This treatment of the staircase block is also seen in the. **Tribune Model School** (1998-99), Chandigarh.

*Fig. 8.3.56: Image of the staircase block at the Auditorium.*
*Source: (Prakash, 2012 p.93)*

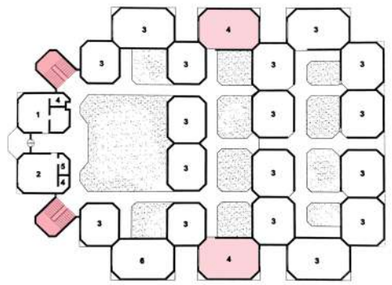



Fig.8.3.58: Diagram showing the service block in the ground floor plan at the Tribune Model School
*Source: (Prakash, 2012 p.93)*

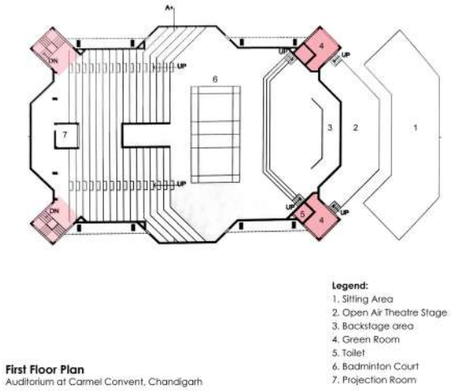



Fig. 8.3.57: Diagram showing the service block in the first floor plan at the Carmel Convent School Auditorium
*Source: (Prakash, 2012 p.94) – Diagram by the author*

At the **CSIR – Institute of Microbial Technology (IMTECH)** (1988-90), Chandigarh, the profile of the staircase is visible as it slightly projects outward from the rest of the building's façade.

Fig. 8.3.59: Image showing the protruding staircase on the façade of the building
*Source: (Bhatti, 2018 p.89)*



## Introduction of courtyards

In his earlier projects like the Guest House at CSIO and the Hostel at Art College, Sharma uses cutouts for ventilation and natural light.

Later in his career, Sharma began incorporating larger courtyards into his designs, particularly in larger-scale healthcare, institutional, and commercial buildings.

A notable example of this approach can be seen in all the buildings at **PGIMER** by Shivdatt Sharma, where the building is divided into 3-4 blocks depending on the function required, and each block is provided with a courtyard covered with skylights. This design feature aims to create a well-lit and pleasant atmosphere conducive to healing and well-being. Similar use of courtyards in each block is seen in the **National Institute of Plant Genome Research (NIPGR) Center** (1999-2000).

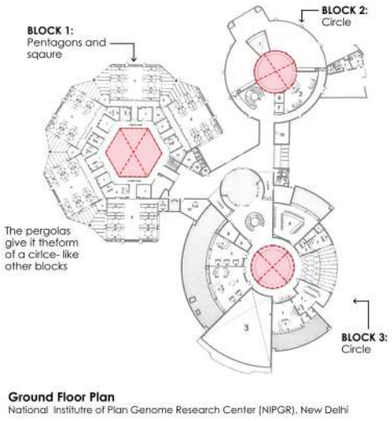



Fig. 8.3.60: Plan of the NIPGR building highlighting the courtyards
*Source: (Bhatti, 2018 p.102) – Diagram by the author*

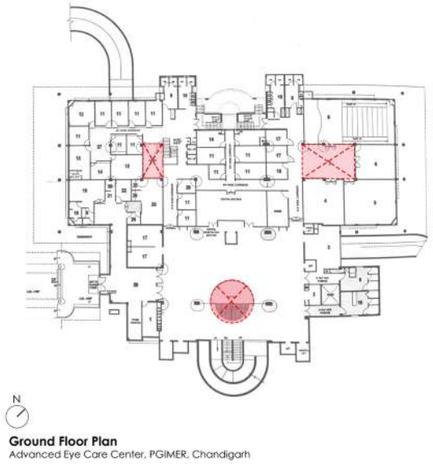



Fig. 8.3.61: Plan of the Advanced Eye care Center at PGIMER highlighting the courtyards
*Source: (Prakash, 2012 p.104) – Diagram by the author*

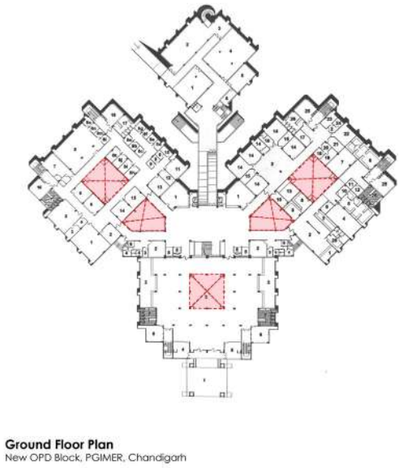



Fig. 8.3.62: Plan of the New OPD Block at PGIMER highlighting the courtyards
*Source: (Prakash, 2012 p.118) – Diagram by the author*

## 8.4 Structure

The form of many of Shivdatt Sharma's projects was directly derived from its structure design, as mentioned in section - **8.1 FORM** on this document. (Refer pg. 54). We see a clear expression of the structure of the building through materials. This is seen throughout his career, but particularly in his early phase, during his time in Chandigarh and ISRO.

In his earlier projects, the concrete frame structure is clearly expressed. This can be seen in the **Hostel at Arts College** (1962), Chandigarh where the thickness of the concrete beams is exaggerated to become a part of the façade. The section of the beam is covered on the façade to create this exaggeration.

The other apporach we see during the same time, is in the projects like **Guest House and the Housing 2/3/4 type at CSIO** (1963-66) Chandigarh, were the beams have been cladded with brick to give a mono-textural look to the façade, thus hiding the structure.

*Pilotis* are evident in the CSIO Canteen and the Teacher's training Institute.

Moreover, many of Sharma's projects demonstrate a separation of the 'skin' and the 'structure'. For example, in the **Museum of Life and Evolution** (1965-67) Chandigarh, there is a gap between the exposed brick wall and the concrete columns on the façade, separating the two.

Fig. 8.4.1: Elevation of the building showing the enlarged concrete beams
*Source: (Prakash, 2012 p. 28) – Diagram by author*

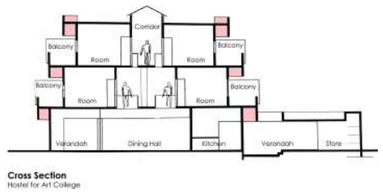
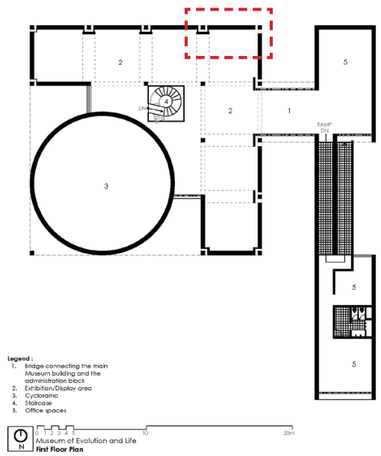



Fig. 8.4.2: Cross section of the building showing the real beam width, which is covered on the façade.
*Source: (Prakash, 2012 p. 29) – Diagram by author*



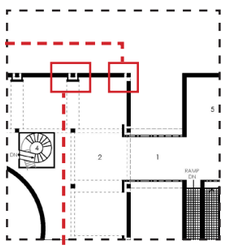



*Fig 8.4.3: Plan of the Museum of Life and Evolution showing the detail of the column and the wall forming a gap*
*Source: (Prakash, 2012 p.57)- Redrawn by the author*

*Fig. 8.4.4: Image showing the highlighted details*
*Source: Photos by the author*



A similar detail is seen in the **Admin building at NIPER** (1992-94), Mohali which was a much later project by Sharma.

In the **Clubhouse for Golf Course** (1965-67) Chandigarh, we see the walls are 'pushed' inwards from the columns, emphasizing this distinction.

Fig 8.4.5: Image showing the detail in the Admin Building at NIPER

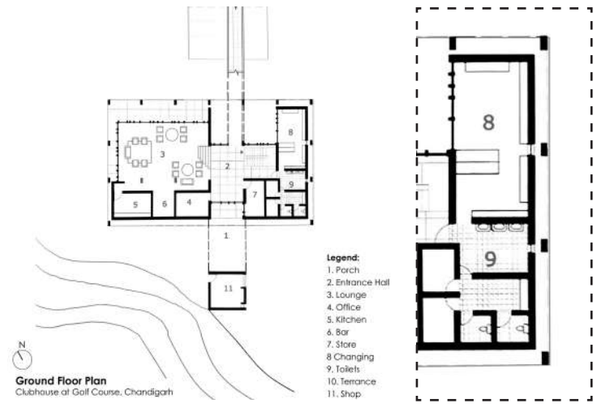



Fig. 8.4.6: Plan of the Clubhouse at Golf Course showing the detail of the column and wall – expressing the distinction between the two
*Source: (Prakash, 2012 p.46) – Redrawn by author*

*Fig 8.4.7: Image of the highlighted façade*
*Source: (Prakash, 2012 p.46)*

The same can be seen in the **Auditorium for Carmel Convent school** (1992-93) Chandigarh, were the columns that support the truss roof of the structure are placed outside the 'envelope' of the building. The form of the building is maneuvered around the column, and the column is placed outside.

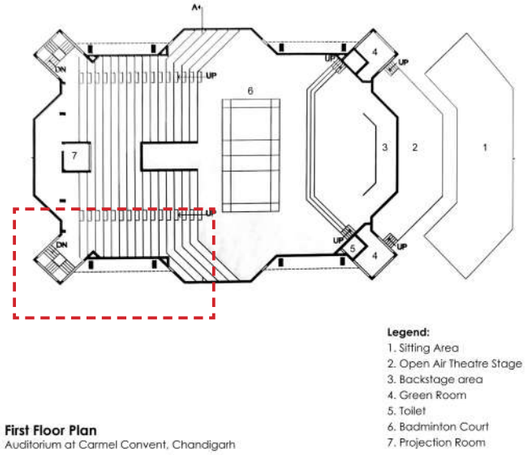



Fig 8.4.8: Plan of the Auditorium at Carmel Convent School showing the placement of the columns and the brick wall around it
*Source: (Prakash, 2012 p.94) – Diagram by author*

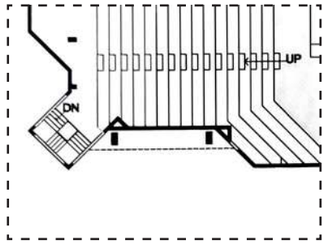
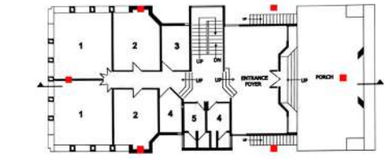



Fig 8.4.9: Images showing the columns places outside and the separation between the column and wall
*Source: (Prakash, 2012 p.93)*

In **Pracheen Kala Kendra** (1998-99) Chandigarh, the columns are expressed as a separate element, and irrespective of the form, the columns remain stagnant. They are hidden and exposed as the form changes.



Fig 8.4.10: Images showing the column on the façade, appearing and moving into the building as the plan changes
*Source: Photos by the author*



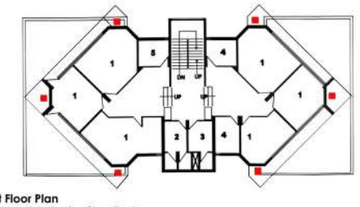




Fig 8.4.11: Plans of Pracheen Kala Kendra highlighting the columns
*Source: (Prakash, 2012 p.91) – Diagram by author*

Sharma commonly utilized the use of concrete frame structure with in-fill walls. Load bearing walls and concrete roof in the **Hostel at Art College** (1962) at **Chandigarh and VSSC Central School** (1973-80) at Bangalore, with brick and stone as material respectively.



Triangular waffle slab used in **Vikram Sarabhai Hall (1973-80)** in Ahmedabad, used in a grid form in each of the triangular spaces i.e. Seminar Hall, Auditorium and Lecture Hall. The form of the building was based on the module of the waffle slab, thus emphasizing on the importance of structure in his work.

In the **Advanced Pediatric Center, PGIMER** (1996-2000) at Chandigarh, the waffle slab was prominently expressed on the balcony. The structure is expressed on façade and used as ornamentation.

Different from all the other projects, **Advanced Eye Care Center, PGIMER** (1996-2000), featured long columns, supporting the above floors that are projecting outwards. Hence exaggerating the structure. This design approach is further developed in the **Entrepreneur Development Center** (2006-2008) in Chandigarh. The columns are given a sculpture like form, and are extended all he way to the roof, supporting the pergola. This was deliberate design decision aimed to create a visually striking and unique architectural form, as required by the brief of the project.

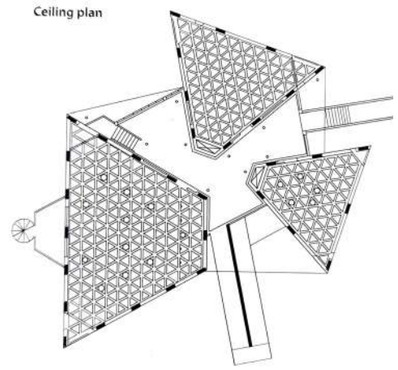



Fig. 8.4.12: Ceiling plan showing the waffle slab
*Source: (Prakash, 2012 p. 71)*

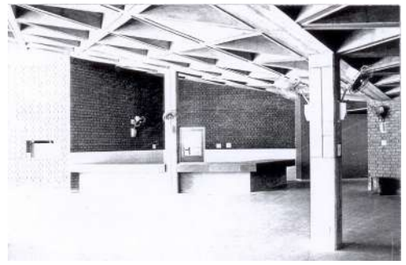


*Fig. 8.4.13: Image showing the waffle slab used at the Vikram Sarabhai Hall in Ahmedabad*
*Source: (Prakash, 2012 p. 70)*

Fig. 8.4.14: Images of the Advanced Eye Care Center
*Source: Photos by the author*

Fig 8.4.15: Image of the Entrepreneur Development Center in Chandigarh

## 8.5 Intent of the architect

Sharma constantly expresses his intent to create a **sculpture like building**, as mentioned by him in an interview. The different approaches he takes to fulfil this intent:

- Through mono-textural rendering of buildings – Sharma uses a singular material to express the entire form of the building such as brick, concrete and Bamboo, creating a unified appearance.
- Solid Forms through articulation of openings – Sharma designed openings that would appear in a grid on the façade. He created a distinct contrast between the open and closed façade. In some cases, he opted for minimal openings, or slit openings to create 'solid forms'.

**Meeting the needs of the user:** To provide well lit and ventilated spaces and to ensure the comfort of the user groups, he introduced cut-outs in the roof in his residential projects in Chandigarh. Later we see the introduction of the courtyards in his bigger projects, specifically the hospitals he designed for **PGIMER**. He mentions that the courtyards helped him to create a positive environment for the patients in the hospital.
Even in service-oriented architecture like his projects for **ISRO**, Sharma intents to create a well-lit and ventilated building to ensure the comfort of the scientist and other staff. The structure has simpler, less complicated form with extensive services.

The intention with which the building was designed was dictated by the **client's brief and function** of the building in various projects and Shivdatt Sharma manifested it in his own way in the built forms. In the **Vikram Sarabhai Hall** (1973-80) in Ahmedabad, the building was set in a context of existing building, hence the triangles were arranged in a manner that the edges of the building were parallel to edges of the existing buildings. Similarly in the **Auditorium and Convection Hall (SGPGI)** Lucknow also was set in the context of other building and hence the form was derived to match the language of the existing buildings as well.

In the **Auditorium at the Carmel Convent School** (1992-93) in Chandigarh, the brief required the building to be a remarkable landmark, but since the project has a lower budget, Sharma decided to use brick as the material, since it was cheap and easily available in Chandigarh and experiment with the form to create striking structure. The intent to create a remarkable and monumental building is seen in the **Entrepreneur Development Center (2006-08)** in Chandigarh**, DLF Shopping Arcade and DLF Shopping Complex (1989-92)** in Gurgaon.

Chapter 9

# Conclusion and Way-foward

**Form:** Sharma employs pure geometrical forms throughout his career, starting with simpler designs in the earlier phase progressing to more complex structures through rotation and champhering in later phases. The form often reflects a Cubism like style in his projects. These pure forms are emphasized more by using a solid plane surfaces, with minimal openings or slit windows. This is described by him as the use of 'solid' form to create sculpture like building.

He also achieves these solid surfaces by articulating the open and closed separately on the façade. But this is approach is only seen in his early phase.

The form becomes more complex as the scale of the project increases. The earlier projects have a simpler form, but in later stage the form becomes more fragmented and complicated. Form is actively used to reflect the intent behind the building. (Illustrated in Fig. 9.1)

**Material:** The use of jali wall in Sharma's work is confined to his early phase in Chandigarh and his projects in ISRO. In later stages, except for some residential projects, the jali wall is notable absent. Throughout his career, the primary materials—brick, concrete, and stone—remain consistent, but their application and approach evolve over time. Initially, Sharma's use of brick reflects the language of Le Corbusier and Pierre Jeanneret, incorporating jali walls and brick patterns. The mono-textural expression is used with more ornamentation and simpler forms. An example of this approach can be seen in the U.T. Guest House, where simpler forms are used with decorative brickwork. As his style evolves, the same mono-textural expression is used with lesser ornamentation and more complex forms. This approach can be seen in the Tribune Model School and Pracheen Kala Kendra, where we see the lack of decorative brickwork, but used of complex forms. Eventually, in the Advanced Eye Care Center, we see the use of brick cladding to create patterns on the façade. **We see the evolution of brick from being used as structure to it being used as ornamentation only.**

Although he doesn't restrict himself to only these materials, and works with the available resources. We see the increase use of glass and steel in his later stage. The brick was used earlier to save cost, and use for small scale projects. (Illustrated in Fig. 9.2)

**Architectural Elements:** The **ramp**, not only as a functional element but also as ornamental feature, becomes a significant element of Shivdatt Sharma's architectural language. It is a clear influence from Le Corbusier that persists throughout his career. The free-standing concrete ramp placed parallel to the building is restricted to his early phase in Chandigarh. The ramp is seen throughout his career, but it loses its prominence as an element. The ramp is either integrated into the building's design or absent altogether. Unlike ramps, Sharma's use of **staircases** as a prominent architectural element emerges later in his career. We see the use of the fire exit staircases on the facade, in his larger scale projects. Fire exit staircases, running from the ground floor to the highest level, are designed to be monumental and visually striking. Over time, the staircase becomes a more prominent architectural element in his work.

Sharma also uses **porches** to create distinct expressions for entrances, though this is not a consistent feature across his projects. Later in his career, this shifts to the use of **pergola**. It becomes a prominent element in his later career. It not only used at the entrance, but also as a means to unify the form of the building and give it a visually appealing landmark or identity. This approach is most evidently seen in the Entrepreneur Development Center in Chandigarh.

The elements are not only used for their purpose, but exaggerated to make a visual impact. For example, the **sun shading devices** used as a façade element in Pracheen Kala Kendra.

Courtyards are later introduced in his larger scale projects. Although we see the use of cutouts and smaller courtyards in his housing projects In Chandigarh from his early phase. (Illustrated in Fig. 9.3, Fig. 9.4, Fig. 9.5)

**Structure:** The structure of the building is expressed throughout his career, either through materials or forms. The idea of expressing the skin and structure of the building separately can be seen in is early as well as later projects. The structure is also exaggerated at the later stage to create a more impactful building. The expression of the structure in the early phase of his career, and becomes more evident and imposing at the end.

Shivdatt Sharma starts his architectural journey in Chandigarh, in the post-independence India. He contributes to nation-building by being a part of the Chandigarh Capitol Project team, and later by playing an instrumental role in development of the infrastructure for ISRO. He starts with the accepted guidelines of Modernism and the architectural language of the masters, and stretches them to make a language of his own.

While his core principle of honest expression remains constant, its manifestation changes over time. This can be seen in his approach towards materials, use of pure geometrical forms, use of a grid in plan, and clear expression of the structure. The important of geometry can be seen

throughout his career.

Simplicity is seen in his buildings in the early stages, as the scale of the projects increases and according to the demand of the client, the form of the buildings become more complex.

Many of his design decisions like mono-texture rendering of buildings, use of solid forms and the articulation of openings were dictated by his intent to create a sculpture like building.

Throughout his career, Sharma ensured that his buildings were well lit and ventilated, economical and made optimal use of the resources and materials available.

Sharma's approach to design evolved to suit the unique characteristics of each region, client and the purpose of the building, resulting in the variation of the end result, since he has worked in multiple regions, with a large variety of client. Hence we don't see a consistent architectural language, after the first phase of his career. His focus on meeting user needs and delivering on client's briefs persisted across projects.

Despite the diverse context in which he worked in, the core principle of modernism – to design with logic and reasoning- remained constant. He refrains from additional ornamentation, but in the later stage, we see ornamentation in form of exaggerated elements like pergola, staircases, ramps, and roof forms. He believes that an architect should be versatile to work with different regions and materials, and not be afraid to evolve with time, and this is reflected in his work

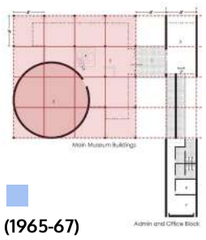
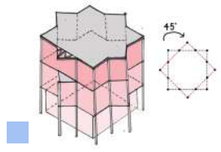
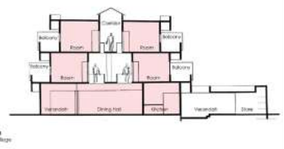
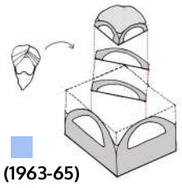
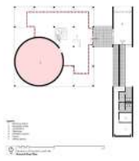
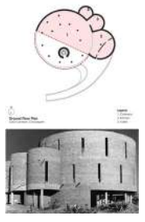
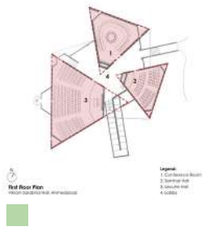
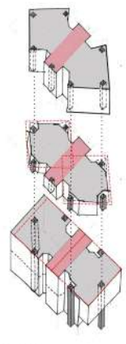
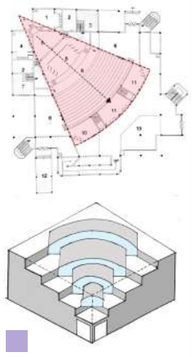


## Way Forward:

The team of Indian architects who worked under Le Corbusier and Pierre Jeanneret were integral to the history of modern architecture in India. There is a gap in the documentation of the work of these architects. A further study could draw parallels between Shivdatt Sharma and other disciples of Jeanneret and Corbusier who worked on the Chandigarh Capitol project. This study would trace their journeys, the various locations where they built, and the spread of Corbusier and Jeanneret's influence. It could also reveal the different way in which these Indian architects adapted the modernism of the masters.

A systematic analysis of particular projects and works of Ar. Shivdatt Sharma mentioned in this document, in the form of primary case studies can prove to provide a deeper understanding of the projects. It also gives a chance to study these buildings from the inside, in terms of planing of the building and programe allocation.

## FORM
(Fig 9.1)

| Different approaches towards form | | | | Form used to provide shading | Clear distinction of the open and closed facade in the form | |
|---|---|---|---|---|---|---|
| Use of pure geometrical forms | The use of cube as the primary unit to develop the form | Form used to respond to the climate, create a visually appealing building, and create interactive space for the users. | Form derived from structure | | (I) On different levels | (II) On same level |
|  **(1965-67)** The Museum of Life and Evolution |  **(1992-94)** Admin Building, NIPER |  **(1962)** Hostel for Art College |  **(1963-65)** **Gurudwara** |  **(1965-67)** The Museum of Life and Evolution |  |  **(1963-65)** Canteen at CSIO |
|  **(1973-80)** Vikram Sarabhai Hall, ISRO, Ahmedabad |  **(1998-99)** Pracheen Kala Kendra |  **(1963-66)** Guest House, CSIO |  **(1988-90)** Auditorium and Convention Center, SGPGI |   **(1965-67)** Building at PGIMER |  **(1965-67)** The Museum of Life and Evolution | |

Chandigarh /Mohali / Ahmedabad/ Lucknow/ Delhi/ Gurgaon

## MATERIAL
(Fig 9.2)

| Brick, concrete, stone - Chandigarh | | | Brick, concrete, stone - Ahmedabad | Concrete and locally available material (ISRO) | Monolithic expression of brick with solid forms - Chandigarh | Stone Cladding | A different expression of brick and concrete | Introduction of new materials |
|---|---|---|---|---|---|---|---|---|
| Load bearing walls with concrete beams and roof | Monolithic expression of brick | Concrete frame structure and brick-infill walls | Concrete frame structure and brick-infill walls | Concrete frame structure and in-fill walls (blocks) | | | | |
|    **(1962)** Hostel for Art College |    **(1963-66)** CSIO  **(1965-67)** U.T. Guest House |   **(1965-67)** The Museum of Life and Evolution  **(1965-67)** Clubhouse for Golf Course |    **(1965-67)** Clubhouse for Golf Course |   **(1973-80)** ISRO Infrastructure Concrete roof, load bearing stone wall  **(1973-80)** VSSC Central School |     |  **(1988-90)** Auditorium and convention center, SGPGI, Lucknow   **(1992-94)** NIPER, Mohali |   **(1996-2000)** Advanced Eye Care Center |   **(2010- 2011)** Bamboo Museum, Palampur |
| Use of stone rubble masonry | | | | | | Cladding also gives an expression of frame structure and in-fill walls | Use of brick as only ornamentation | |

Evolution of expression of brick

## Ramp as an element

### Inspiration

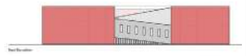
**(1963-65)**
Mill Owner's Association Building by **Le Corbusier**

**(1960-67)**
Maison de l'Homme in Zurich by **Le Corbusier.**

### Reflection

**(1963-65)**
Canteen at CSIO

**(1965-67)**
Clubhouse for Golf Course



**(1965-67)**
Museum of Life and Evolution

**(1969-70)**
City Museum

**(1973-80)**
Vikram Sarabhai Hall

## Staircase as an element

### Inspiration

**(1961)**
Housing type 13-J by Pierre Jeanneret

### Reflection

**(1963-66)**
Housing type-I at CSIO

**(1963-66)**
Guest House at CSIO

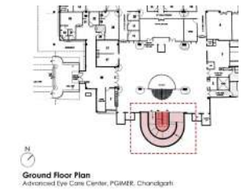
**(1992-94)**
Admin building at NIPER

**(1988-90)**
Auditorium and convention center, SGPGI

### Fire exit Staircase

**(1989-1992)**
DLF Shopping Plaza and Arcade

**(1996-2000)**
Advanced Eye Care Center




**(2006-2008)**
Entrepreneur Development Center

Chandigarh /Mohali / Ahmedabad/ Lucknow/ Delhi/ Gurgaon

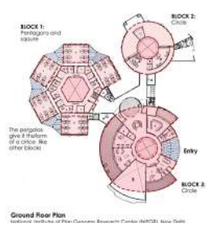


## Pergolas as elements

**(1992-94)**
Admin Building, NIPER, Mohali


**(2001-2002)**
HSIIDC Office

Pergola between blocks




Pergola at entrance

**(1999-02)**
National Institute of Plant Genome Research (NIPGR)

### Commercial

**(1991-92)**
DFL Shopping arcade

**(2006-08)**
Entrepreneur Development Center

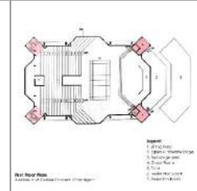
### Residential

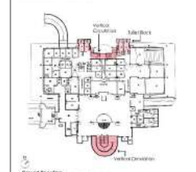
**(1991-92)**
Dr. Amod Gupta's Residence

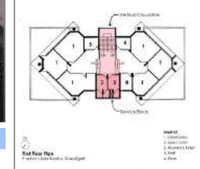
**(1990-91)**
Self residence

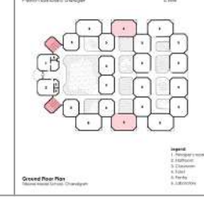
## Expression of the services block on the facade

### Plan









### Image

**(1992-93)** Auditorium at the Carmel Convent School

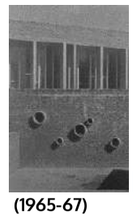
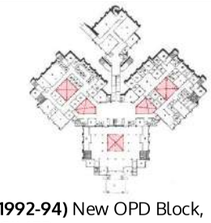
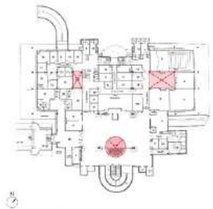
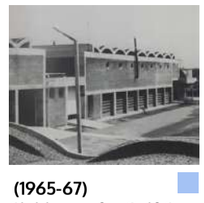
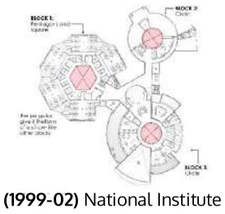

**(1996-2000)** Advanced Eye Care Center

**(1998-99)** Pracheen Kala Kendra

**(1998-99)** Tribune Model School

Chandigarh /Mohali / Ahmedabad/ Lucknow/ Delhi/ Gurgaon

**Openings/ Courtyards**

| Use of undulatory glazing - **Chandigarh** | Use of Vertical Louvers | Use of circular openings | Use of sun-shading devices | Introduction of courtyards |
|---|---|---|---|---|
|  **(1963-65)** Canteen at CSIO |  **(1965-67)** U.T. Guest House |  **(1965-67)** U.T. Guest House |  **(1963-66)** Housing type 2,3,4 |  **(1992-94)** New OPD Block, PGIMER |
|  **(1965-67)** Clubhouse for Golf Course |  **(1992-94)** Library at NIPER, |  **(1965-67)** Clubhouse for Golf Course |  **(1998-99)** Pracheen Kala Kendra |  **(1996-2000)** Advanced Eye Ca Center |
|   **(1965-67)** The Museum of Life and Evolution |  **(1969-70)** City Museum |  **(1965-67)** Clubhouse for Golf Course | |  **(1999-02)** National Institute of Plant Genome Research (NIPGR) |

Chandigarh /Mohali / Ahmedabad/ Lucknow/ Delhi/ Gurgaon

# Appendix

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## List of Figures

## Interview with Ar. Shivdatt Sharma

### Interview 1

**Interviewee :** Ar. Shivdatt Sharma

**Interviewer :** Nitya Bhargava

**Date of Interview :** 15.02.2024

**Mode of Interview :** In-person interview

**Location of Interview :** SDSA Office, Swastik Vihar, Panchkula, Haryana

**Me:** So sir, I was studying about the evolution of your work. So I wanted to firstly know that were there any influences in your early life that made you take up architecture as a profession?

**S.D Sharma:** Mine is a very peculiar story. I am a shattered survivor of the partition which took place, dividing India, Pakistan, so I could cross the border and escape the massacre. So even after coming to this side, we had no money and no house to live. It went on for a long time, maybe for a few months.

Till such time, my parents settled in Jalandhar and I went to Delhi to a cousin of mine who is a doctor. I looked forward for something.

What to do without money? I joined the Hindu College, taking up economics and mathematics.

The fee came for a month, but next month I couldn't get it. So my studies all jeopardized. I couldn't continue my academic career. Then, how to proceed with education without money?

It was very difficult. Then suddenly there was an advertisement that in PUSA Institute, Delhi, they are having an architectural course. They also pay. Hostel is there. So I think it's a God sent thing. And I passed that.

Then many people from that class, they joined evening classes to do architecture. I also joined.

But then, that also I couldn't continue. Because that again needs money, place to live. Because I can't be with my cousin for long.

So then there, after a year or two, evening studies, somehow, there was an advertisement for Chandigarh thing. And we all left studies and came here. And we started from the lower rungs.

And I qualified as an architect in 1959. Then, like the hierarchy in the government office, Assistant architect, then architect, and then architect, etc. like that. It went on.

And in very early days, when I was assistant architect, I started working with Jeanneret. Most of the time, I was with Jeanneret

And in (19)62- (19)63, he introduced me to Corbusier. And he told Corbusier that he will work with you on your Museum and Art Gallery project.

So, I started working. The drawings were sent from Paris in metric scale. You converted these things, all those drawings into feet- inches for construction, this-that, make working drawings. So, that went on for a year or more than that.

And somehow, in 65, I had the last meeting with him. He started telling me. How to do the interiors, what color scheme?

Some of those sketches are still with me.

And some of the building was maybe first floor. He died in (19)65, same year. He went back and died. And the whole responsibility of completing that building came on me.

And Mr. Randhawa, who was the first chief commissioner of Chandigarh, he was very helping.

And more or less, he and myself, we both got the building completed and I think it went very well. And this is one of the best museum building of Corbusier because he has done two more, one in Ahmedabad and the other is in Tokyo. And this is probably the best, neat, clean, very very decent interior .So what I say is that this is probably the best.

In these books (Architecture of Shivdatt Sharma by Vikramaditya Prakash) you might have seen my interview with a Japanese architect.

**Me:** Yes sir.

**S.D. Sharma:** So that is fine.

So then this went on and the whole scenario changed after his death, Jeanneret also left in 1965 and then an Indian architect came who took over as Chief Architect, Mr. M N. Sharma He and me, we both worked together up to 1973.

Then, I had to go to Bangalore to take up as Chief Architect in Department of space. Spent about 8-9 years. This is one of the best period of the career. Did some wonderful jobs. Got a certificate from the chairman, Mr. Homi that we are proud of this building that you have created.

Anyway, then after 8-10 years there, almost things were over. Only small little things started which don't interest me and I left. And I started, came back to Chandigarh and started my practice in 1980.

Until today I am sitting here doing something. So this is the whole story. And so far your questions of philosophy and all that. I am a Modernist, you know it.

**Me:** Yes sir.

**S.D. Sharma:** And modernism of Corbusier was in a big way in Chandigarh. He brought all his philosophy in Chandigarh, especially in the Capitol. And we thought that his philosophy and modernism concept are very vital for the modern world. And we adopted that as a second religion. And till today as a modernist we follow his philosophy or his way of thinking which we thought that it is the best. And Modernism is still going on although Postmodern came in between.

But modernism, because it is based on logic and rationality, it will live. Because anything based on logic and rationality which you can explain will naturally is not going to fade. It will live. And it is still living. So that is how we are working as a Modernist.

And we had adopted the best of the philosophy which Corbusier brought to Chandigarh in a very big

way. So maybe one can say that you have influence of Corbusier and Jeanneret in your works.

Yes, Here and there, one can see the influence of Corbusier and Jeanneret in my work. But it is not an imitation. We have, many people have given me certificate that he is gone beyond Corbusier.

And, but here and there some sort of fit up and feeling of spaces and the manifestation of architecture by way of exteriors, order, purity, simplicity,all these generic principles we follow in doing architecture.

Basically, the question that from an architect to another architect is that which philosophy do you work with, I have explained all that. I'm a Modernist, because we follow his generic principles.

**Me:** Yes.

**S.D. Sharma:** And his philosophy, not blindly, but considering that this is the best philosophy because it is based on rationality and logic.

So, we liked that. And the whole world also appreciates his way of thinking and his modernism.

So, that is how we are. So, we did not have to look here and there. It was a straight guided path given to me.

There is no confusion in my career. It was a channelized career, and the channel that was given to us by Corbusier, that this is the way and we followed it.

This is how it is, that is simple.

**Me:** So, sir, in your career, was there, apart from Corbusier and Jeanneret, was there any other influence through your career?

**S.D. Sharma:** Nobody is that capable.

**Me:** Or other professionals you worked with?

**S.D. Sharma:** When you have Corbusier and Jeanneret in the world, nobody is parallel to them. So no, no other influence.

As I told you, we have a clean, bull-like channel to go on working on that. And that will take us to a good destiny, rather than any fear of falling anywhere. So, we have a very clear path to follow, we should keep moving on this path. And even if we keep moving on that path, it is a big deal.

I imagine, with the help of Corbusier, or whatever it is, you know it. So even if we are able to achieve some percentage of it, it will be a big deal.

So, we don't have to run here and there. We have a clear path to follow. And we have taken it as our own philosophy, our own way of life.

With clear understanding that it will take us to understand, the certainties of architecture and creating nearly reasonable work in architecture.

**Me:** So, do you view any of your projects as threshold projects or landmark projects that were important in your career? Maybe you see a change in course or...



**S.D. Sharma:** Nitya, It's like asking a poet, which one you like.

You see, one thing is that you have these books. And you can yourself decide that I like that. But so far, I'm concerned... There are a couple of things, a couple of projects. For example, CSIO projects. Or some... Department of Space. You can see them in Ahmedabad, The Sarabhai Hall. The satellite center which is near Bangalore.

I did a very good project there because there was total freedom and I did not have any problems because there was a world known scientist. Sarabhai, Homi, many good people. Abdul Kalam was also there.

We used to work together. They are also looking for something unknown and we are also looking or something unknown.

For example, In the Sarabhai Hall, I have made a triangle for every job. I did not have any problem in selling it because they were scientists of that repute. When I said that their functioning is the same, only difference in height, length, etc. in terms of the scope of it. But the functioning is the same. Whether it is a conference or a bigger auditorium or a small meeting room or whatever.

So, you know better. So, I think yes, go ahead.

And this is the first building which you should study more deeply. In which we have said that it is a dialogue between architecture, structure and services. These three have a connection with each other.

See, the roof in this is of funicular shells. No services are inside. Instead, there is only one switch in which controls the light. And the air conditioning is all on the roof.

And that is in the triangles, you can see that in the drawings. Those are all funicular shells that sit completely with the building. Whether it is small or big. There are funicular shells used. And that was the first time in the country these shells were used.

And the structural engineer from Madras. He did it. I was happy to create that Gurudwara.

Le Corbusier and Pierre Jeanneret were one of the greatest architects, And the whole world knows and says it. So what else do you need? If there is such a faculty to teach you, so then it depend on everyone's potential on how much they can learn.

They saw my potential and chose me to work with them. Only 2-4 people got the opportunity to work with Le Corbusier out of nearly 100 architects working on the Chandigarh Project. I got this rarest of the rare opportunity to work with him.

## Interview 2

**Interviewee :** Ar. Shivdatt Sharma

**Interviewer :** Nitya Bhargava

**Date of Interview :** 30.04.2024

**Mode of Interview :** Telephonic conversation

**Me :** Hello Sir, I was studying your work and mainly I was focusing on four buildings (Museum of Evolution and Science, Vikram Sarabhai Hall, Pracheen Kala Kendra, Advanced Eye Care Center), which was the case studies that I mentioned. So there were two things that really that came to me was the massing, the importance of massing and how you use pure forms like cubes and the placement of these forms.

For example, the case of Museum of Science and Evolution. So I wanted to ask you about your design process and how do you reach to that massing or the expression of pure forms?

**Sir :** Okay. In this, I tell you very clearly that every plan has to be geometrically proved with geometrical dimensions.

Or maybe modular dimensions. Because it can't be irrelevant.

It has to be in a geometrically proved pattern in plan and also in elevation. So that's the approach.

Okay. Sir, I also mentioned about this article that Ar. Apoorva Bose had written, which mentioned monolithic expression and solid forms. So if you could elaborate on that, the expression of, or monotextural expression, which we see, for example, in the Auditorium for the Carmel Convent School or the Tribune Model School.

Yes. I see that the Corbusier's buildings are monotextural and concrete. So I thought, why can't I have a monotextural? Because it gives like a feeling of a sculpture. If it is monotextural, it becomes a sculptural something. Otherwise not.

And that is I wanted to try in my buildings, although it was not tried before even in Chandigarh by Jeanneret or anybody else. So I wanted to make a sculptural sort of thing.

In pure dimensions, or geometrically proved, it may be modular dimensions, it may be the golden section or anything but it has to have the basics of some ideology otherwise I don't like random.

**Me :** Sir I also see the emphasis of the expression of material in your work so I wanted to ask you what your…

**Sir :** Yes Yes, you see that it is always better in life of an architect to use versatile materials like brick and concrete. These two are very versatile materials, after once they are installed they don't need any sort of maintenance, maybe due course of time after two years it may get little blackish but that can be wiped out clearly. Similarly in brick you don't need any maintenance after it is done and it stays like a sculpture, maybe it gets aged with the time doesn't matter. But the proportions in the plan and elevation and as a visual it should be very very appealing like a sculpture.



**Me :** For example I noticed in the museum of Life and Evolution, it was my observation that maybe the dimensions were calculated from the size of the brick and that's how the grid was developed.

**Sir :** That's right.

**Me :** So I was looking at your project uh in Lucknow the Auditorium for the Sanjay Gandhi Post Graduate Institute. I think that that is where I see the peak of innovation and I think that this project departs from your usual architectural language that. So I wanted to know if there was any underlying concept that the building was based on or your decision making process for that building.

**Sir :** You see, this auditorium building has very innovatively derived certain sort of sectional elements which gives us a very three-dimensional picture, which becomes appealing and it is structure only. Tt's only through structure and not through any artificial things and this goes well with the wards, the other wards which have been used in the other buildings by another architects, in the different buildings so i also tried to, in this canvas, build a ward by shear structure of the auditorium

And also so it becomes economical. In a smaller span the truss is smaller and as it (the span) goes bigger and bigger the truss becomes bigger so automatically this sort of result comes and the area around is also treated like this and the whole thing merges very well.

Talking about one idea, it's not a hotch-potch. This is a projection of one idea with a lot of _,so that the total result is very appealing it's an award winning subject the many of these projects which you have taken about us are award winning

These two versatile materials are we talked about- the brick and the stone. In the NIPER (National Institute of Pharmaceutical Education and Research) stone is used in the exterior because by and large as the time passes, the quality of brick is getting worse, and also it is advocated that we should also use the fly-ash blocks and so on, to make the building very economical, which is the need of the day.  So we cannot use it (fly ash brick) in the exterior as it is very porous and it takes water, so it's cladded with stone. And that is also a versatile thing because after that application of stone without this also doesn't need any maintenance so that is what it is. Stone, brick, concrete.

**Me :** Sir, while I was reading about your work during ISRO, so in the Ammonium Percolate Plant, you had used fly ash bricks and the three cars but I think that was because of region difference and because it had to be built fast and the construction had to be efficient. Sir I wanted to ask if there were other regional variations that you had to adapt to while you were working with ISRO because of this.

**Sir :** ISRO, we had free hand but then there in south there is no brick, and it is not very common something for the workers to work with concrete, so there we have used the hollow block that were available there and also used this stone, available in the south, Trivandrum, we have used that stone which was very porous and very delicate.

**Me :** sir I wanted to ask you about the Museum of Bamboo that you designed, I think that was the first time that you worked with Bamboo?

**Sir :** In this case it was the first time. The small little sheds we have been doing using in (bamboo) in

temporary things in department of space here and there but this (the Museum of Bamboo) was in a big state and the director of that institute, the Himalayan Resources, he said that let us exploit the potential of bamboo so that people are tempted to use bamboo more and more in the weddings.

So with that we have developed different forms where it pans horizontal, where it goes vertical, and where there are some skylights, what is the exterior finish, the interior finish with mats and so on. All possibilities and potential which bamboo has, I have tried to use. So that is the idea.

So when the material changed from brick and concrete and stone, I felt that a lot of the ideology of Chandigarh manifested itself through material. So when the material changed, how did you still practice your ideology as a modernist?

**Sir :** The idea is to use local materials. Whatever is available locally. So one should not be afraid and also sort of be handicapped that I have to only use where our brick is not available at all. So one should be, as an architect with an open mind and see what is locally available to make the building cheaper.

Not cheaper, but economical. And it gives a different perspective. It speaks of that land. Not that you build something in Trivandrum which speaks of Chandigarh. No. That's what I have done.

Some sheds there in Trivandrum. And they said, much more complex than a building. Each column is bringing in services. The communication system is so strong in the department of Satellite.

The whole building becomes full of communication lines. It is very, very interesting. It is dropped everywhere. It requires little effort. It becomes very, very interesting. The architecture is very interesting

The architect should be very innovative in trying to use the local material, local facilities, local skills. And all you want is you want to find the answers. And you should never feel handicapped when you go away from the usual work, when you have done something. But you should never feel handicapped. You should try something which becomes a very innovative answer to the questions there.

Yes, I think that would be all sir. That's all I wanted to ask.