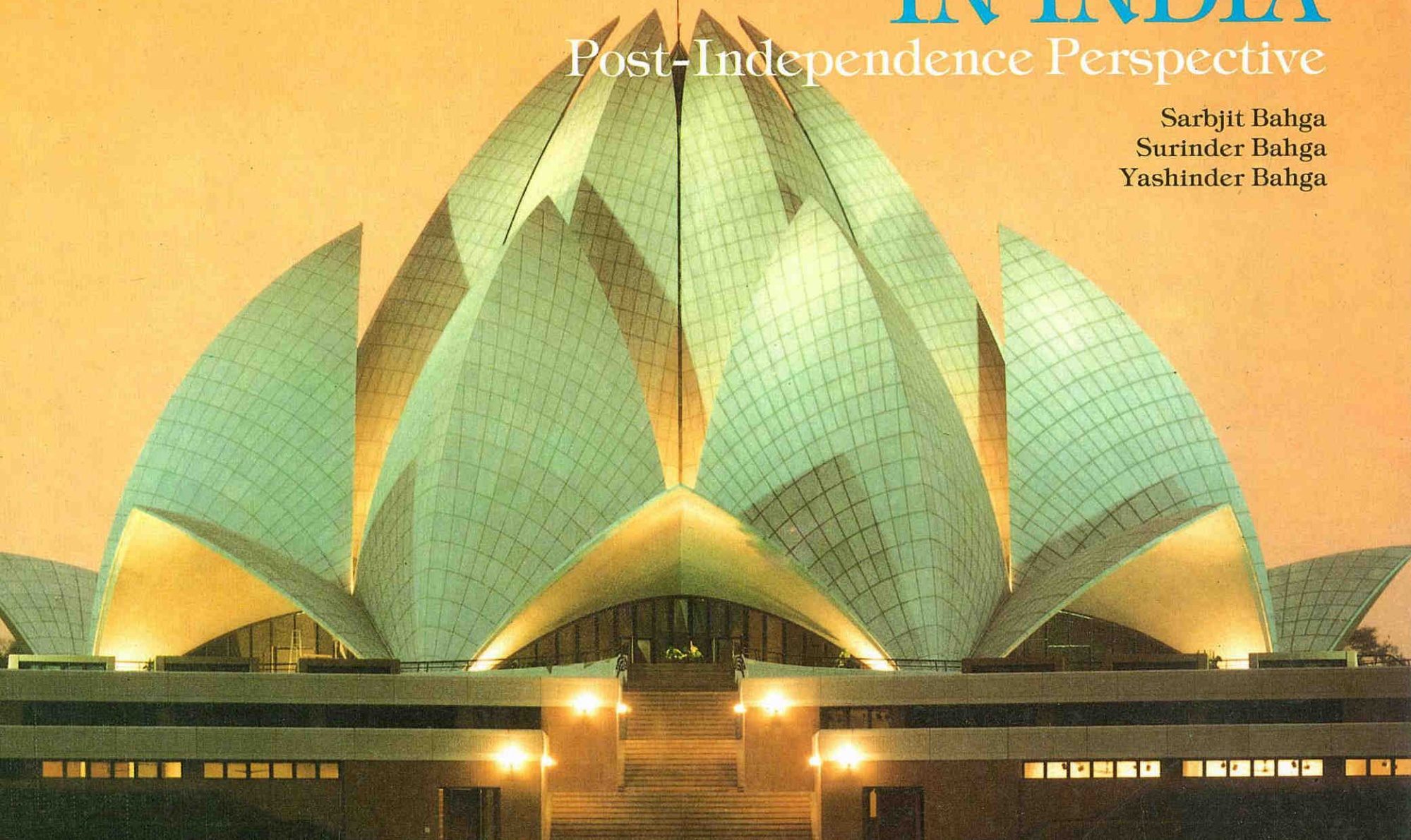
# MODERN ARCHITECTURE IN INDIA

## Post-Independence Perspective

Sarbjit Bahga
Surinder Bahga
Yashinder Bahga



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# *Foreword*

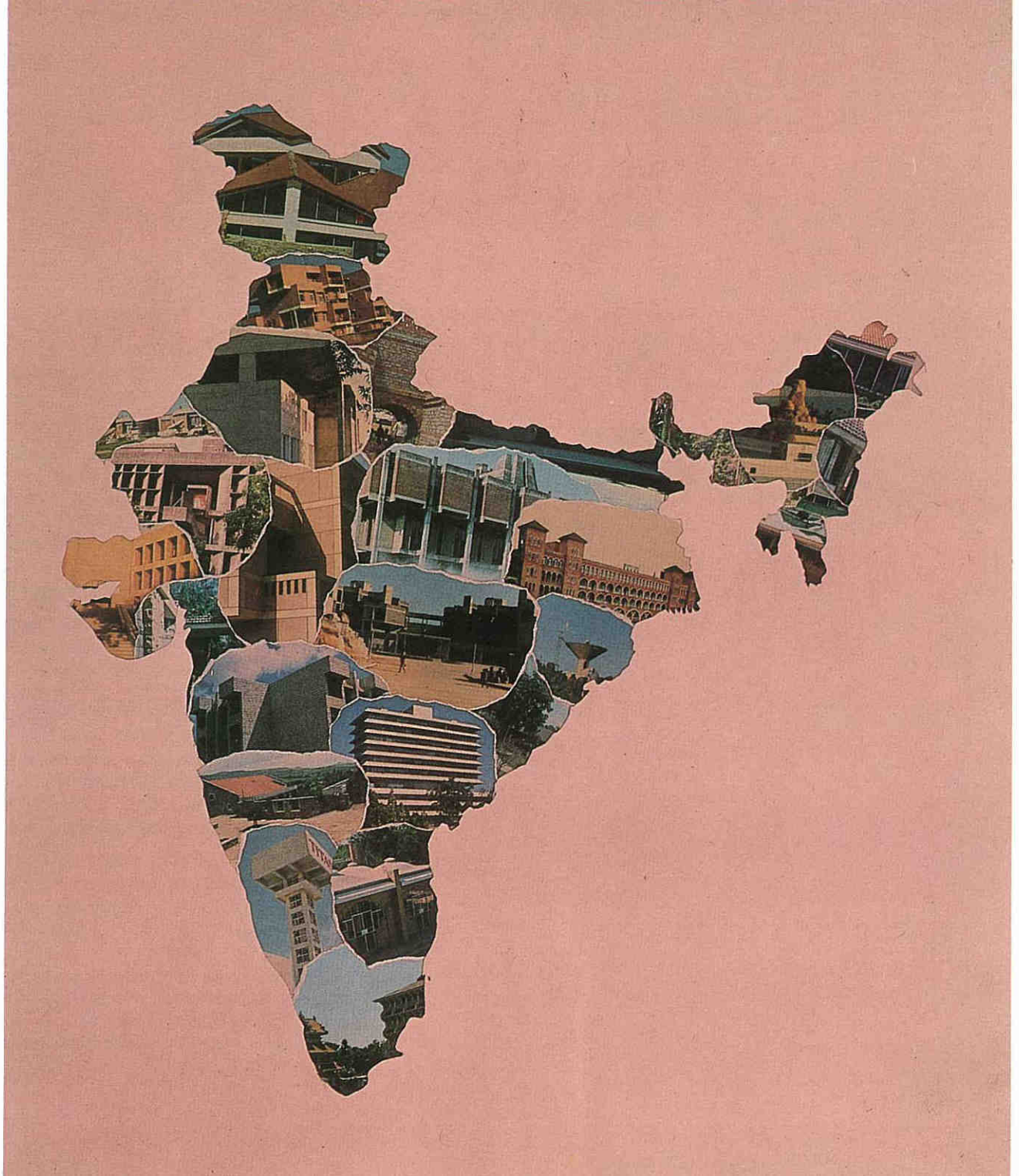
I am delighted to write the Foreword to this book. It is quite time that present-day Indian architecture receives more recognition.

The word 'India' has to the British ear a magical sound. So many years of close association between the two peoples has led to a special relationship. However, when the British occupied India they failed for the most part to appreciate Mughal and Hindu culture and its architecture. The many Indians who have made Europe and America their home have made better sense of European culture and architecture.

One very good thing is that 'modern' Indian architects have made very little attempt to copy the past styles. There are some exceptions such as the feeble Ashoka Hotel in Delhi, but for the most part the many good Indian architects—Charles Correa, B.V. Doshi, Achyut Kanvinde, Jeet Malhotra, U.E. Chowdhury, Ashok B. Lall, Romi Khosla (to name a few at random)—have, instead of copying either Hindu or Muslim or British Indian architecture, evolved styles suited to the Indian climate, way of life and economy.

Unfortunately, no Indian politician since Nehru has really done much to use the talent available. France, for example, has benefited enormously from Mitterrand's patronage. The need for India to use architects to solve its great housing and planning problems is self-evident. I hope this book will educate those in authority to administer a greater deal of patronage. Chandigarh offered the Indian architects a great opportunity but that was almost fifty years ago; a great deal still needs to be done now.

JANE B DREW



# Introduction

India, the largest developing country in the world, is endowed with a rich cultural and architectural heritage. Copius works have been written on its ancient art and architecture but woefully few publications are available on its architecture after Independence, and these too are either restricted to personal monographs of leading architects or others which lack comprehensive information and discussion on the subject. A few journals published in the country are the main source of information but these are inadequate to cope with the demands of the times, and in the absence of healthy competition, except in the case of two or three, they fall below international standards. Besides, the material published in these journals is on diverse topics and lies widely scattered, making it virtually impossible for a serious reader to glean all the information and material and form a picture of the whole. The vastness of the subject of architecture and the pace of development in India need volumes of books, monographs and journals to cover the entire scenario.

This work claims to be one of the first publications on Indian architecture in the post-Independence era.It discusses 98 projects designed by 14 foreign and 53 Indian architects. The projects studied and illustrated in the book include capital cities, towns, townships, universities, hostels, group housing and educational, cultural, sports, religious, administrative, commercial and industrial buildings. These projects are arranged in a chronological order so that changes and trends can become self-evident at a glance. The projects are grouped decade-wise into four sections. Each project has been explained in a uniform style and is supplemented by appropriate drawings and photographs. Apart from giving factual information about each building illustrated, we felt that no critical commentary was called for and hence avoided it. Nonetheless, our subjectivity is undoubtedly reflected in the examples we have chosen to illustrate. The projects themselves represent only a section of the entire scenario and there are several other outstanding buildings which we wish we could have included but this was not practically possible and, as such, we have preferred to give a microcosmic picture to reflect the macrocosm.

Our Chapter 1, "India: Land, Climate and People", is a brief account of the country, acquainting the readers, especially foreigners, with various facets of this vast land. This chapter is well supported by a map of India showing the boundaries of the states and the locations of the projects discussed.

Chapter 2, "From Imperialism to.... Indianism or Regionalism" dwells on the architectural development during the British Raj and the post-Independence period.

In Chapter 3, we get down to the various "Projects" under study, taking these up in the context of architecture, urban design, town planning and landscaping.

Chapter 4, "Futuristic Approach", records a few suggestions for the benefit of professionals who have embarked upon improving our built-environs.

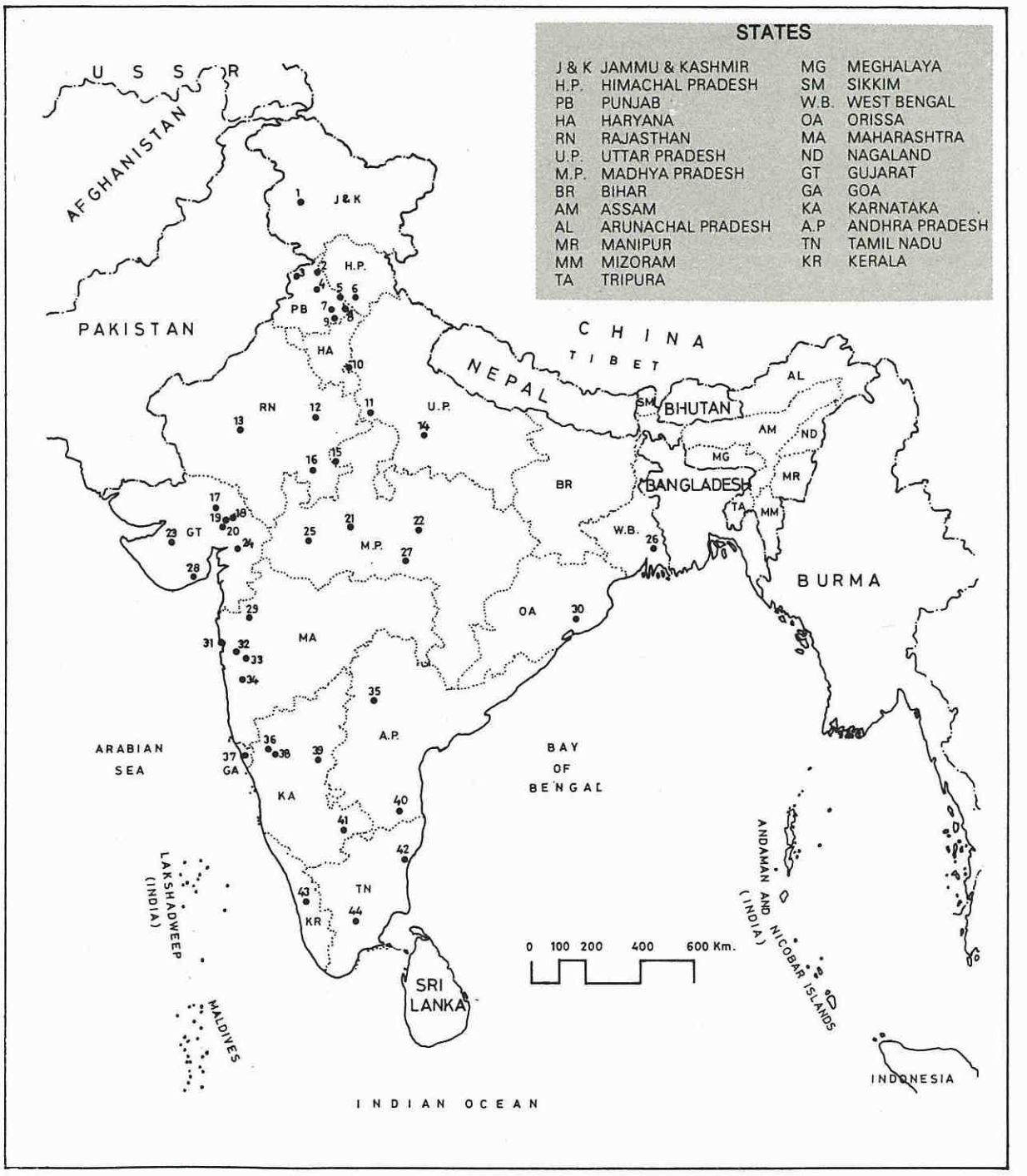
This work was conceived of and is presented as a reference book for the use of primarily four sections of society to enable them to have an overview of the different styles of architectural development in this subcontinent. The first group we hope to reach comprises professionals like architects, planners, engineers and builders, besides other persons engaged in building activity. The book should act as a source of inspiration to stimulate their creative instincts. In the second group we have in mind are students of art and architecture, town and country planning, urban design and landscape architecture. In the absence of sufficient indigenous treatises, our institutions imparting architectural education have to rely heavily upon works from other developed nations, which only aid in importing ideas having none or very little relevance to our conditions. This book, hopefully, will provide a broad base which our institutions could use to remodel their curricula in order to have future architects capable of finding their own solutions to their problems. The third section of readership aimed at includes tourists, both Indian and foreign, on sight-seeing and architectural tours. We have tried to adopt a simple and concise method of explaining each project, which could help them in selecting specific places of interest. The fourth section which we are trying to reach is the general reader having sufficient interest in modern architecture. This work, it is hoped, will be of value to any serious reader who is inquisitive to know more about India.

The selection of projects and material for illustrations was a colossal task and the present work is not beyond criticism, but we have to draw a line somewhere. The various available possibilities were studied but not found feasible and finally we decided to prepare our own code for selecting the material. Even if some other strategy had been adopted, the end-result would have varied only slightly. The decisive criteria which governed our choice were that the projects must cite innovation and should represent as many periods, styles, types and regions as possible. Only completed projects are featured as their qualities can be judged easily and described accurately. Unbuilt projects have thus been avoided because their presentation could be misleading.

The book includes drawings sufficient to understand the project and photographs of finished buildings. Perspectives, architects' scribblings, elevations and photographs of models have largely been avoided, except where considered necessary to ensure a more realistic presentation.

LOCATION OF PROJECTS

| | | | |
|---|---|---|---|
| 1 | SRINAGAR | 23 | RAJKOT |
| 2 | TALWARA | 24 | VALLABH VIDYANAGAR |
| 3 | AMRITSAR | 25 | INDORE |
| 4 | JALANDHAR | 26 | CALCUTTA |
| 5 | ANANDPUR SAHIB | 27 | SEONI |
| 6 | KUFRI | 28 | KALSAR |
| 7 | SIRHIND | 29 | NASIK |
| 8 | CHANDIGARH | 30 | BHUBANESHWAR |
| 9 | PATIALA | 31 | BOMBAY |
| 10 | NEW DELHI | 32 | LONAVALA |
| 11 | AGRA | 33 | PUNE |
| 12 | JAIPUR | 34 | PANCHGANI |
| 13 | JODHPUR | 35 | HYDERABAD |
| 14 | KANPUR | 36 | DHARWAD |
| 15 | VADODARA | 37 | GOA |
| 16 | KOTA | 38 | HUBLI |
| 17 | MEHSANA | 39 | VYSANKERE |
| 18 | DANTALI | 40 | TIRUPATI |
| 19 | GANDINAGAR | 41 | BANGALORE |
| 20 | AHMEDABAD | 42 | AUROVILLE |
| 21 | BHOPAL | 43 | TRICHUR |
| 22 | JABALPUR | 44 | MADURAI |



# Acknowledgements

We must first express deep gratitude to all the architects, Indian as well as foreign, who have ungrudgingly allowed us the use of their projects, although, with much regret, we were unable to use the material supplied by some of them. We are much indebted to architects Ms Jane B. Drew, Mr. B.V. Doshi, Mr. Anant Raje, Mr. Jasbir Sachdev, Mr. Yetinder Mathur, and Prof. A. Richard Williams (Illinois University, USA) for their guidance and constant encouragement in accomplishing this work. Deep appreciation for assistance rendered is also due to Ms. Rajul Shah, Editor, *Indian Architect and Builder,* Bombay; Mr. Jeet Malhotra, former Chief Architect, Government of Punjab and Ex-President Indian Council of Architecture; and Prof. S.S. Bhatti, Principal, Chandigarh College of Architecture, Chandigarh.

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We are indebted to Mr. Promod Kale, Director, Space Applications Centre, Ahmedabad; Mr. Otto H. Koenigsberger, Editor, Development Planning Unit of *Habitat International,* London; Ms. H. Kapasi, Library Director, The American Centre Library, New Delhi; and Mr. E. Le Maistre of the Architectural Association, London, whose active support made the whole project possible.

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We sincerely appreciate the help rendered by many of our friends, especially M.C. Bharadwaj, Anshu Mahajan, Rana Ram, Tarvinder and Manmohan Sharma. The enthusiasm for the project shown by Ranjit Patel has been heartening all through.

Finally, we must acknowledge with a sense of deep appreciation the contribution of our family members who stood by us with encouragement when it was most needed and whose support proved catalytic during the course of writing this project.

## PHOTO CREDITS

Photographs are courtesy concerned architects and Ashish K. Maitra (*A+D*, May-June, 1989), Deepak Sarin, Dinesh Mehta, Director Space Applications Centre, Ahmedabad, Hardev Singh, Homi Lal, Hotel Le Meridien, Hotel Taj Bengal, *Indian Architect and Builder* (September 1987), Jaswinder Sahota, Jatinder Singh, K. Ramachandran (*A+D*, March-April 1990) and Geoffrey Bawa Trust, Manmohan Sharma, Paramjit Singh, Rabi Shankar Dey (*A+D*, July-August 1990), Rolf, Suminder Bahga, Suresh Sharma, Suresh Wadia, *Technique and Architecture* (August-September, 1985), Vivek Das (*A+D*, July-August, 1990) and Yatin Pandya.

# *Architects Represented*

## FOREIGN ARCHITECTS

1. Albert Mayer, USA
2. Bernard Kohn, France
3. Fariburz Sahba, Israel
4. Geoffrey Bawa, Sri Lanka
5. Jane B. Drew, UK
6. Le Corbusier, France
7. Louis I. Kahn, USA
8. Matthew Nowiczki, USA
9. Maxwell Fry, UK
10. Otto H. Koenigsberger, UK
11. Pierre Jeanneret, France
12. Piero and Gloria Cicionesi, Italy
13. Philip Johnson and John Burgee, USA
14. Roger Anger, France

## INDIAN ARCHITECTS

1. Achyut Kanvinde, New Delhi
2. Anant Raje, Ahmedabad
3. Anil Thakur, Chandigarh
4. Ashok Dingankar and M.L. Ahuja, Patiala
5. Ashok B. Lall, New Delhi
6. A.V. Joshi, Ahmedabad
7. Bali Benjamin and Associates, New Delhi
8. Bimal H. Patel, Ahmedabad
9. B.P. Mathur, Chandigarh
10. Balkrishna Doshi, Vastu-Shipla Foundation, Ahmedabad
11. Chandavarkar and Thacker, Bangalore
12. Christopher C. Benninger, Pune
13. C.S. Menon, Enarc Consultants, Trichur
14. Department of Architecture, Punjab Chandigarh
15. Design Group, New Delhi
15. Development Architects, Calcutta
17. Dulal Mukherjee and Associates, Calcutta
18. Hasmukh C. Patel, Ahmedabad
19. Jeet Malhotra, Chandigarh
20. Kamu Iyer, Architects' Combine, Bombay
21. Kulbhushan Jain and Minakshi Jain, Ahmedabad
22. Laul and Associates, New Delhi
23. M.N. Ashish Ganju and Mark Warner, New Delhi
24. M.N. Joglekar, Design and Development Wing, HUDCO, New Delhi
25. Nek Chand, Chandigarh
26. Office of the Chief Town Planner and Architectural Advisor, Capital Project, Gandhinagar
27. Prem Nath and Associates, Bombay
28. Raja Aederi Consultants Private Limited, Bombay
29. Raj Rewal Associates, New Delhi
30. Rumy Shroff and Associates, Bombay
31. Saakaar Foundation, Chandigarh
32. Sabikhi and Choudhury Architects Private Limited, New Delhi
33. Sachdev Eggleston Associates, New Delhi
34. Sanon Sen and Associates, Calcutta
35. Satish N. Madhiwalla, Bombay
36. Satnam Namita and Associates, Chandigarh
37. S.D. Sharma and Associates, Chandigarh
38. Sen Kapadia, Bombay
39. Shirish Beri, Kolhapur
40. Shivnath Prasad, New Delhi
41. Sikka Associates, New Delhi
42. S.L. Chitale and Son, Madras
43. Somaya and Kalappa Consultants Private Limited, Bombay
44. S.S. Bhatti, Chandigarh
45. J.S. Dethe, Chandigarh
46. Stein Doshi and Bhalla, Ahmedabad
47. Sudhir Diwan, Bombay
48. Suhasini Ayer-Guigan and Serge Maini, Auroville
49. Suraj P. Subherwal, New Delhi
50. Suryakant Patel, Sthapatya Kendra, Vadodara
51. T. Khareghat and Associates, Bombay
52. Uttam C. Jain, Bombay
53. V.K. Jain and Rana Ram, New Delhi

# Contents

# INDIA: LAND, CLIMATE AND PEOPLE

CHAPTER 1

India is one of the oldest civilisations of the world with a kaleidoscopic variety and a rich cultural heritage. It has achieved multi-faceted socio-economic progress during the period of 45 years since Independence. The country has become self-sufficient in agricultural production, is now the tenth most industrialised country in the world, and the sixth nation to have sent scientific equipment into outer space to conduct research for the ultimate benefit of mankind.

India is distinctively cut off from the rest of Asia by the high Himalayan ranges in the north and sweeping seas on the remaining three sides. Such a location on the continent makes India an entity on its own, remarkable in geographical factors and environs. Bounded by the great Himalayan wall in the north, it tapers into the Indian Ocean between the Bay of Bengal on the east and the Arabian Sea on the west.

Almost two-thirds of the country lies to the north of the Tropic of Cancer, between latitudes 8°-4′ and 37°-6′ north and longitudes 68°-7′ and 97°-25′ east. The mainland stretches 3,214 km from the north to the south and 2,933 km from the west to the east. The total length of the coastline of the mainland is about 6,100 km. The Andaman and Nicobar Islands and Lakshadweep Islands are also an integral part of the Indian Union. India is the seventh largest country in the world with a total land area of 32,87,782 square kilometres, which accounts for nearly 2.5 per cent of the world's total land mass.

The countries with a common border with India are Afghanistan and Pakistan to the north-west, China, Bhutan and Nepal along the north and Myanmar and Bangladesh in the east. Sri Lanka is separated from India by Palk Strait in the south.

Physiographically, India can be divided into seven regions, namely the Himalayas, the great Indo-Gangetic plain, the central highlands (including the Vindhya and Satpura ranges), the peninsular plateau, the east and west coastal plains, and the oceanic islands. Stretching from Kashmir to Assam, the Himalayas are a series of almost parallel ranges interspersed with plateaus and valleys. The Indo-Gangetic plain, which is highly productive from the agricultural point of view, is one of the most densely populated areas in the world. The plain is crescent-shaped, has stretches of alluvium, and extends from the Arabian Sea to the Bay of Bengal. It is almost a flat level plain with homogeneous topography with some wind-blown sand-dunes. From Calcutta on the eastern coast to Delhi in the north, the plain has an elevation of about 200 metres. Broadly speaking, it comprises the States of Uttar Pradesh, Bihar, West Bengal and parts of Punjab, Haryana and Rajasthan. The peninsular plateau is separated from the Indo-Gangetic plain by the Vindhya and Satpura hill ranges. Peninsular India is relatively stable and is rarely affected by seismic disturbances. The States of Madhya Pradesh, Maharashtra, Orissa, Andhra Pradesh, Karnataka, Kerala and Tamil Nadu constitute the Deccan plateau and the central highlands. The eastern coastal plain extends from the Ganges delta in West Bengal to Kanniyakumari. The western coastal plain, beginning from the Malabar coast in the south, runs to the north all along the Arabian Sea. The Andaman and Nicobar Islands are 550 in number, many of them are too small for habitation. The Lakshadweep Islands lie 320 km off the coast of Kerala in the Arabian Sea.

The river system of India may be broadly classified into the following groups:

- The Himalayan rivers which, since they are snow-fed, are perennial and can cause havoc when in spate during the monsoons.
- The non-perennial peninsular rivers, which are generally rain-fed and whose flow thus fluctuates with the seasons.
- The coastal rivers which, especially on the western coast, are short in length and have limited catchment areas. Most of them are torrents and non-perennial.
- The streams of the inland drainage basin of western Rajasthan and Haryana. These are mostly of an ephemeral character. The streams are seasonal and ultimately lost in the sands.

India is a meteorological unit in itself. Its climate is influenced by two exterior factors. On the north, the Himalayas prevent it from the extreme cold winds of Central Asia and Siberia and give it a "continental climate". In the south, the Indian Ocean makes India a hot monsoonal country, more typical of the tropical than the temperate zone. Virtually the whole of the area between the mountain wall and the Indian Ocean is fed by the south-west and north-east monsoons. As such India is a tropical monsoon country.

However, the conception of the broad unity of a monsoon-induced climate should not lead us to ignore striking regional variations in the country's climatic characteristics. Despite a

broad uniformity in the climate, it has several regional variations which are expressed in the pattern of winds, temperature and rainfall, the rhythm of the seasons and the degrees of humidity. Such differences in the climate are naturally determined by location, altitude, distance from the sea or the mountains and the general relief. Let us cite some instances of the variations in temperature, winds and rainfall patterns. Barmer in Rajasthan may record a temperature of 48° to 50° C on a June day, while the mercury might barely touch 22° C at Gulmarg in Jammu and Kashmir the same day. On a December night Dras or Kargil in Jammu and Kashmir could easily record the minimum temperature as low as −40° C while Trivandrum or Madras would show 20° or 22° C. Differences can also be seen in rainfall patterns. For instance, Cherrapunji in Meghalaya receives 1080 centimetres of annual rainfall, whereas at Jaisalmer in Rajasthan it rarely exceeds 12 centimetres. The Ganges delta and the coastal plains of Orissa are hit by strong rainstorms almost every third or fifth day in July and August, while the Coromandel Coast, a thousand kilometres to the south, goes dry. The Brahmaputra valley is often virtually submerged by floods in July, while the sun-bathed Bihari peasant might still be sitting cross-legged on his parched fields, waiting for the rain clouds. The people of Bombay and the Konkan coastal areas on the west have hardly any idea of the extremes of temperature and the seasonal rhythm of the weather. Besides, there are differences in the onset and the retreat of the monsoons.

India comprises 25 States and seven Union Territories. It has a total population of about 860 million which is almost 16 per cent of the world's population. After China, it is the second most populous country in the world. About 74 per cent of the people live in the rural areas with agriculture as their mainstay. The distribution of population is very uneven, varying from State to State and region to region. Being a huge chunk of the subcontinent in itself, India harbours, ethnically and culturally, a great diversity in its population. The country has as many as 3,768 urban agglomeration/towns and 5,78,413 villages.

Indian towns and cities are classified on the basis of population. Class I towns have a population of one lakh and above and include the metropolitan cities which have a population of one million and above and are administrative districts in themselves. In 1991 there were 300 Class I towns, including 19 metropolitan cities and 4 mega cities. The number of Class II towns with a population of 50,000 to 99,999 was 345. The numerical strength of the Class III towns with a population of 20,000 to 49,999 was 947. Of all the categories, Class IV towns with a population of 10,000 to 19,999 were numerically the highest, totalling 1,167. The number of Class V towns with a population of 5,000 to 9,999 was about 740, while that of Class VI towns with a population less than 5,000 was 269.

There are 15 languages and 768 dialects spoken in the country. The main religions followed by people are Hinduism, Islam, Christianity, Sikhism, Buddhism and Jainism, besides a few other persuasions. Each region's geographical environment has determined the culture of the people inhabiting it. As a result of frequent interaction between different peoples, each culture has absorbed and adopted something of the other.

In brief, the variations in geographical and socio-economic factors have given birth to different life-styles of the peoples, each possessing their own cultural ethos, beliefs, dogmas, festivals, folklore and mores, art, dress, dietary habits and, of course, architectural designs for their dwellings.

# FROM IMPERIALISM TO... INDIANISM OR REGIONALISM

CHAPTER 2

*It will be useful to explain the intent of this chapter right at the beginning. It is not proposed to give here a detailed historical survey of the various schools of architecture like the Buddhist, the Hindu and the Mughal schools prevalent at the beginning of the seventeenth century, by which time the British had acquired a foothold in India. The focus of this chapter is on the process by which British architecture was implanted in this country and on the transition from this process to an Indian view of architecture which emerged as a response to the challenge posed by an imperialist art of building.*

India cast off the yoke of British colonialism more than four decades ago. The fetters and chains that chafed and restrained were cast off and a new era was ushered in with Independence. Having found an anchorage with the advent of freedom, we went through a process of introspection in order to find our own solutions to our problems. But whither have we gone? Now is the time to assess our achievements objectively and thence to steer our intellect with newly furbished skills to achieve the objectives set afresh.

The era of independent India is a continuation of the pre-Independence period. Hence, for the benefit of a perspective, the pre-Independence period, that is, the British Raj and the architectural development during that period, must form a prelude to a study of the era of independent India.

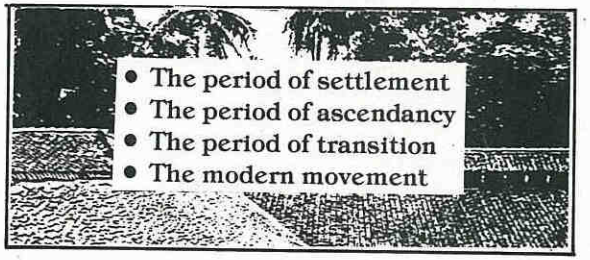
## THE RAJ

In the beginning of the seventeenth century, the British acquired a foothold in India as speculative traders. The country was then ruled over by the Mughal dynasty, based in the north. At that time the traders of the British East India Company held just a rival position with the Portuguese, who possessed colonies in Goa and Bombay since the sixteenth century, and Dutch, French, Swedish and Danish merchants in the ports. In 1639, the East India Company established its government in Madras on the eastern coast and three decades later the Company, in a tidal sweep, obtained possession of Bombay as well. By now the Company was a power to be reckoned with. The influence of the Mughals was on the wane and their fall was imminent. The Company felt the pulse of the times, assumed the powers of a State and was, to all intents and purposes, the sovereign authority in Bombay, Calcutta and Madras, the three principal ports of India. These ports were then known as Presidency towns. By the 1850s the whole subcontinent was under the sway of the Company, which had by now defeated its foreign rivals as well as insurgent Indians. A British Governor-General with headquarters in Calcutta was the supreme authority. The Mughal Emperor was a weakling, the lesser Indian princelings were just pale shadows of power and the French, the Dutch, the Danes, the Portuguese and the Swedes were either expelled or posed not even the ghost of a threat. The Indian Mutiny, called "The First War of Independence" by Indians, broke out in 1857 but the political and economic power of the British was in the ascendant. The outcome of the uprising was that the British became even more securely saddled in unchallenged power and authority.

In 1858 the Company formally handed over the reins of power to the British crown. This made India a British colony. It now came to be ruled by the Queen-Empress in London who was represented by her Viceroy in Calcutta. It was a dream realised which was ultimately doomed to shatter. The growing spirit of nationalism, the upsurge of the Indians en masse, guided by the votaries of non-violence, struck a fatal blow to the British rule in India. The British could not withstand the onrush of Indian nationalism and patriotism and had to leave the country. The small hours of August 15, 1947 heralded the end of about 300 years of British colonialism.

## ARCHITECTURAL DEVELOPMENT

For a purposeful and comprehensive survey of the changes in the attitude and style of architecture during British rule our purview admits of sub-classification pertaining to four distinct periods.

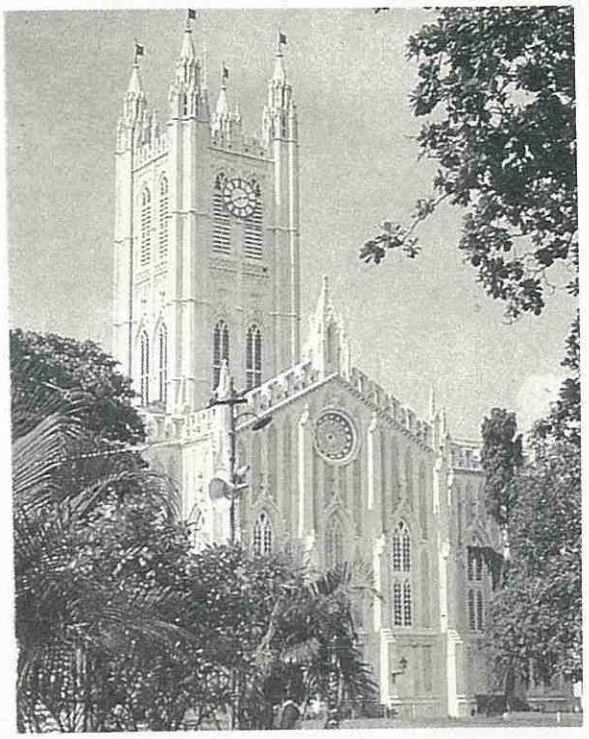


## The Period of Settlement

During the period 1640-1840 the British faced the onerous task of consolidating their position all over the country and exercising their authority by force, as was done by their predecessors. Well-protected military stations containing the requisite facilities and infrastructure for those away from their original homes were of paramount necessity. So, first they constructed forts in the three Presidency towns and for years their original settlements were enclosed within fortified walls. The prominent among them were Fort St. George at Madras and Fort William at Calcutta. Built in 1750, the former was designed by Benjamin Robins. Within its high walls, the fort contained offices, warehouses, an arsenal, barracks and living quarters, besides a church, a theatre, auction rooms, a library, a bank, etc. The new Fort William at Calcutta (which replaced the earlier one that had been proved inadequate to withstand an attack in 1756) was perhaps the greatest and most famous of Anglo-Indian military stations. Designed by Captain Brohier and completed in 1773, this was one of the most advanced fortresses of its time. Located on the banks of the River Hooghly, the fort is an irregular octagon in plan and is surrounded by a moat. Five massively fortified gates provided access to it, over water on one side and by land on the other. The area around the fort was cleared of marshy outcrops for an easy view of the enemy. This area later became Calcutta's Maidan—a grand park in the heart of the city. At the centre of the fort stood St. Peter's Church and between its grid of alleyways was a regular warren of barracks, bomb-proof chambers, interconnected galleries and stables.

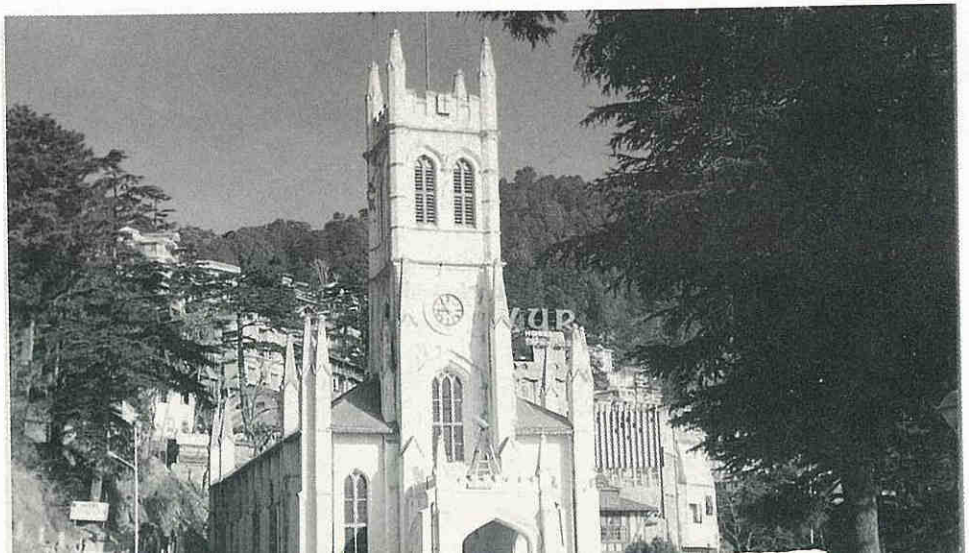
In the next phase, when the British penetrated further into the land, they established several military stations, which, however, were not fortified. "Cantonments", as these were called, were functionally planned and were self-sufficient military towns having their own markets, slaughter-houses, churches, cemeteries, jails, hospitals and services like water supply. These were generally located at a distance of eight to ten kilometres from the subjugated cities and were connected with them by roads and at a later stage by railway lines. By the 1860s, there were about 175 such cantonments. These were often elaborately equipped and planned functionally on a strict grid-iron pattern of streets. All the principal buildings were largely oriented to receive the season's breeze. A distinct segregation of various functions and activities was another major planning criterion. The officers were segregated from the subordinates, the quarters of the married from the barracks, the British troops from the natives, the artillery from the cavalry and so on.

The biggest of the cantonments was at Secunderabad, in the State of Hyderabad. It contained a headquarters building, a bazaar, a club and a hotel, besides bungalows and a church. A wide green belt on the edge of the complex contained a race course, a polo field, a cemetery and a vast parade ground. Another landmark, which was nicknamed after Windsor Castle, marked the innermost redoubt of Secunderabad. This military fortification had the dual purpose of being the last bunker in case of an emergency. The castle, with a round tower, fortified gateway, cruciform slits and Tudor turrets, was built in gleaming white stone and stood in splendid isolation above the rocky outcrops.



St.Paul's Cathedral, Calcutta

Christ Church, Shimla



## The Period of Ascendancy

The period 1840-1900, which can be termed as the period of ascendancy, was, in a way, an extension of the British school of architectural thought. During this period Western architecture, irresistibly palpable to the mind, was discernible in the buildings erected in India by the British. They needed these buildings soon after assuming the reins of the government by the mid-nineteenth century. Till then they were neither prepared to part with their European style of architecture nor were they equipped to study, mould, adapt or develop indigenous architecture in the context of their needs. Since this period coincided with the industrial pre-eminence of the British in the world, the architecture they produced in India was the mirror image of their achievements at home. Christ Church, Shimla (1844), St. Paul's Cathedral, Calcutta (1847), Queen's College, Benaras (1847), Bombay University, Bombay (1870), Indian Museum, Calcutta (1875), Victoria and Albert Museum, Bombay (1877), Viceregal Lodge, Shimla (1880), Dalhousie Square, Calcutta—the Secretariat of the then Bengal Government (1880), and Victoria Terminus, Bombay (1887), are some of the building examples which pertain to this period and stand witness to a distinct and unmistakable European style of architecture.

Christ Church on the Ridge at Shimla, with its rising tower, was built in the Gothic style of architecture. It was designed to infuse a sense of security and stability in the entire Christian population of this hilly town and the nearby areas. St.Paul's Cathedral, on the south-eastern edge of Calcutta's Maidan, with its splendid scale, tall pinnacled steeple and reverent works of art and craftsmanship, had a classical design steeped in orthodoxies. The detailing was all Gothic. The entire expression is ribbed, lined or chiselled with emphasis on verticality. Queen's College at Benaras is another example of a similar style. Its ornate and gorgeous buildings provide a grandiose and imposing contrast to the simplicity of its surroundings. The pinnacles and the ornate windows and niches are both a thing of beauty and a mystery.

Bombay University at Bombay, like the other universities in the Presidency towns, was established to disseminate British ideas and values among the Indian people. Designed by Sir Gilbert Scott, it comprises an oblong quadrangle with double-storeyed blocks surrounding it and an open entrance with the library on one side and a convocation hall on the other. It is built in pure Gothic style with elaborately buttressed balconies, ogee windows, open spiral staircases, statue niches, stone carvings, pinnacles, and ornate arcades.

The imperialists laid equal emphasis on the construction of museums, with exhibits like archaeological relics, ancient guns, fabrics and gigantic representations of British history which they thought proper for the instruction of the Indians. The Indian Museum at Calcutta and the Victoria and the Albert Museum at Bombay are some of the important museums of this period. The former was designed around a colonnaded courtyard full of greenery and was reminiscent of an Italianate palace and the latter was a French Renaissance building.

The Viceregal Lodge at Shimla, with its three-storeyed main block has, when viewed from the north-east, lofty, stern, almost forbidding aspect and could be mistaken for a medieval castle. It was the first government house to have electricity and European-style kitchens. Built with locally available grey limestone, the Lodge excelled in elaborately carved woodwork. Dalhousie Square at Calcutta, now known as BBD Bagh, was allegedly built in the French Renaissance style and its buildings are replete with architectural symbolisms of one sort or another and ornamented with sculpted figures of didactic import.

The Victoria Terminus at Bombay was built to celebrate Queen Victoria's Golden Jubilee in 1887. Designed by F.W. Stevens, it could well be termed the truly central building of the entire British empire. Its Italian Gothic structure with several domes, pinnacles, protruding turrets, tall stained-glass windows, meticulous carvings, curly tendrils, and whirligigs expresses in a nonpareil style the majesty, splendour and stateliness of imperialism.

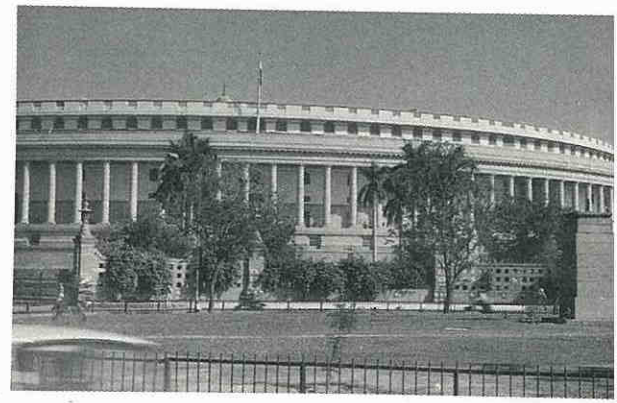
Victoria Terminus, Bombay

## The Period of Transition

In the period 1900-1925, conscious efforts were made by British architects to take into account the Indian conditions while building. By so doing, they were attempting to send signals through the medium of architecture that, despite being an imperial people, they were organically and inextricably part of the Indian scene. Conscious efforts to express such a synthesis resulted in weird hybrid styles of architecture. A British architect, Sir William Emerson, thought that buildings in India should show a distinctively British character and at the same time should adopt the details and essence of native architecture. Howrah railway station at Calcutta (1906), designed by Halsey Ricardo, and the Capitol Complex at New Delhi (1912), designed by Edwin Lutyens and Herbert Baker are examples of a revived imperial architecture breathing an air of Indianness. In their endeavour to make architecture more rational and appropriate to its locale, the British architects had to compromise with elements from the Buddhist, Hindu and Mughal building vocabularies. Howrah railway station, built in red brick, reflects the influence of Tibetan monastic features. The monotony of its complex and rigidly symmetrical facade is broken by eight solid brick towers, six of them with wide eaves and two with solid square tops.

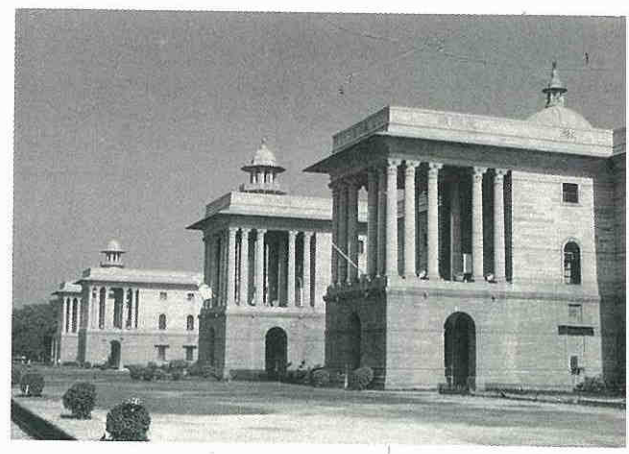
About the style of architecture to be adopted for New Delhi, Lord Charles Hardinge, the then Viceroy of India, felt that pure Eastern and pure Western architecture would be quite out of place. He emphasised the need to blend both styles. He was confident of the popularity of the new imperial architecture of Delhi. As he put it: "I have no hesitation in saying that I have absolutely the whole of India at my back in wishing that the new city should be built in accordance with Indian sentiments. I do not by this mean that the town should be built of highly ornate or Hindu architecture; but my idea is that it should be a fine broad style with a minimum of decoration, but that decoration should be of the purest and most ancient Hindu ornament. Opinion in this country is quite unanimous on the subject and after all who are we building for—the Indian or the British public?"[1] Herbert Baker also believed that Indian sentiments could be satisfied by grafting onto classical British architecture certain decorations expressing the myths, symbols and history of the Indian people. Thus spacious colonnades, open verandahs, overhanging eaves or cornices, narrow and high window openings, *chhajjas* or wide, projecting shade-giving stone cornices, *jaalis* or pierced stone lattice screens to admit air and not glare and *chhatris* or free standing pavilions breaking the long horizontal lines of the flat roof were incorporated into his scheme for two secretariat blocks. Baker, in a letter to *The Times* of October 3, 1912, explaining his views about the style of architecture to be followed for New Delhi, wrote: "The new capital must be the sculptural monument of the good government and unity which India, for the first time in its history, has enjoyed under British rule. British rule in India is not a mere veneer of government and culture. It is a new civilization in growth, a blend of the best elements of East and West..... It is to this great fact that the architecture of Delhi should bear testimony."[2]

Edwin Lutyens, being a staunch believer in the principles of classicism, had always advocated Western designs and was strongly opposed to hybrid forms of Indian and European architecture. He believed that European classicism embodied all that was civilized, rational and humanist. His scathing criticism of Indian architecture was: "I do not believe there is any real Indian architecture or any great tradition. There are just spurts by various mushroom dynasties with as much intellect as there is in any other art nouveau.... India has never had any real architecture, and if you may not graft the West out here, she never will have any."[3] He further added: "Architecture, more than any other art, represents the intellectual progress of those that are in authority. In India, they have never had the initial advantage of those intellectual giants the Greeks, who handed the torch to the Romans, they to the great Italians and on to the



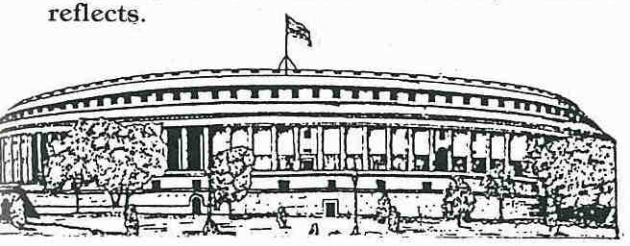
Parliament House, New Delhi

Secretariat, New Delhi—two views



Frenchmen and to Wren, who made it sane for England.... I should have liked to have handed on that torch and made it sane for India, and Indian in its character."[4] His determined efforts, however, ultimately resulted in a complex of exceptional scale and unique picturesqueness, reflecting baroque classicism. His hard principles of Western classicism were to some extent diluted, perhaps due to the sweeping persuasion of Lord Hardinge who declared to Lutyens that "it would be a grave political blunder, and in my opinion an absurdity, to place a purely western town amidst eastern surroundings."[5] This is evident from Lutyens's design for the Viceroy's Palace in which some elements of traditional Indian architecture are incorporated. The arches, the projecting cornices and the decorative *chhatris* are reminiscent of both Hindu and Mughal architecture. While the large central dome resembles a Buddhist *stupa*, the railings remind you of those found at the *stupa* in Sanchi. Even the adjoining garden west of the palace has been designed on the pattern of the Mughal gardens.

Despite their endeavour for indigenisation of the European style of architecture by readjusting proportions, adapting layouts, being more responsive to the climate of the country and by the vivid use of shade and shadow with the help of projecting eaves, verandahs, porticos blocked by rattan screens and windows with shutters, the emphasis was on the form, external expression, vistas, axes and symmetry. As such, although this European style of architecture undoubtedly possesses artistic taste akin to Indianness, it is nonetheless soulless. There are no glimpses of Indian styles of living in it. Architecture is frozen music and as such must express the soul of the society which it reflects.

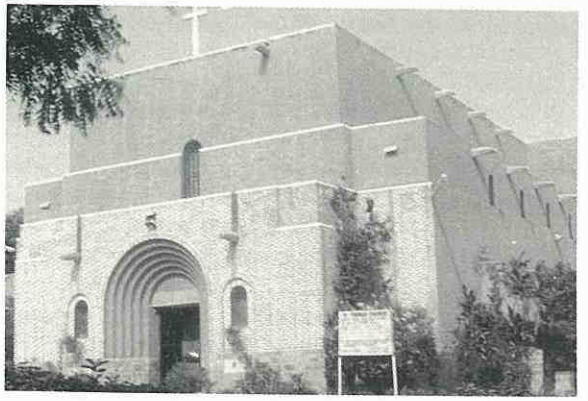


## The Modern Movement

During the period 1925-1947 the truth dawned on British architects that if their works in India were to pulsate and vibrate with life, these must mirror the culture and the living styles of the Indians. British architecture in India was now compatible with the habits, ways of life, culture and the life-giving spirit of the natives. St.Martin's Garrison Church, New Delhi (1928), St.Thomas's Church, New Delhi (1929), and St. Stephen's College, Delhi (1938), besides the lesser—known low- to middle-income housing in New Delhi are some of the illustrations of the living styles of Indians rolled into architectural materials. This form of architecture evolved from modern concepts and ideas and could well be called the harbinger of modern architecture in India.

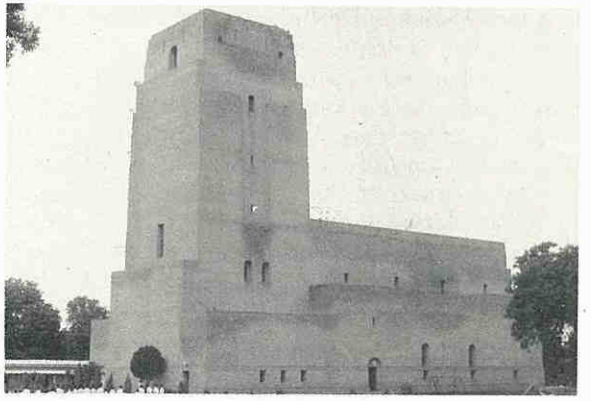
St.Martin's Garrison Church embodies technical innovations in architecture, casting aside stylistic orthodoxy. Designed by Arthur Shoosmith, this fortress-like building is built entirely in exposed brickwork. The square-shaped building with its sharp profile, rough surfaces and almost windowless facades has interiors of an extremely classical nature with a brick dome above the chancel. The massive angularity of the exterior is softened by curves above the doors and deeply-recessed windows. St. Thomas's Church, designed by Walter George, exemplifies a similar departure from traditional style. Like St. Martin's Church, it also embodies exposed brick surfaces and simple geometric forms. Intended for the use of Indian sweepers, the building is economically built and modest in scale.

St. Stephen's College in old Delhi too was designed by Walter George. It is a living monument, expressing in eloquent silence the changing trends in architecture. The complex incorporates a series of arcaded walkways and courtyards, displays simple horizontal massing and unvarnished surfaces in combination of red brick and grey stone. The artifice of design was purported to keep out the vagaries of the climate. These buildings, with simple geometric forms and smooth, finely-finished surfaces



St. Thomas's Church, New Delhi

St. Martin's Church, New Delhi



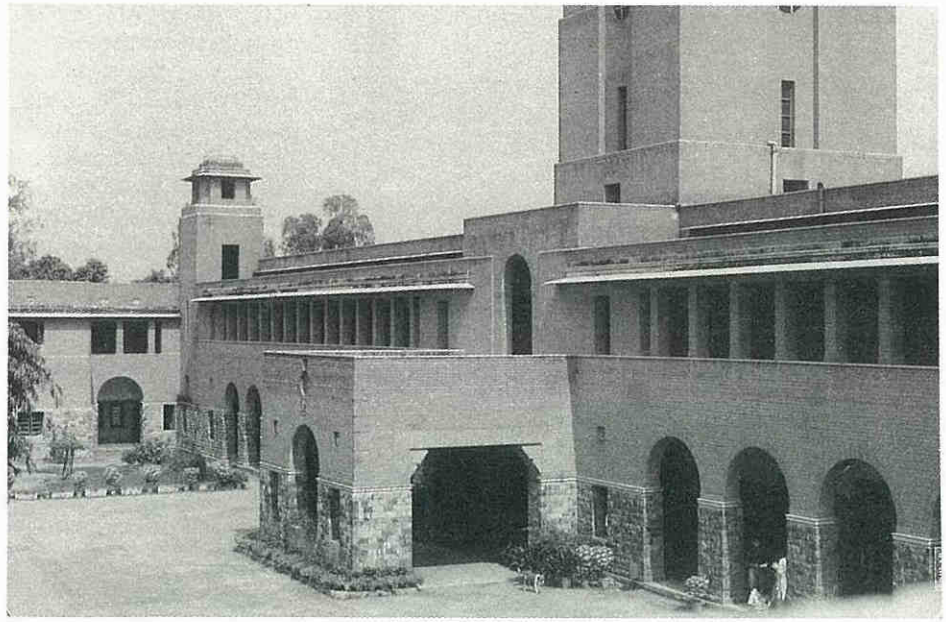
free from overmuch and redundant garnishing, not only responded well to the local climate and the existing technology but also provided an admirable precedent for the advent of modern Indian architecture.

Likewise, the low-income housing complex in the Gole Market area and the middle-income housing complex on Ferozshah Road in New Delhi, both designed by Henry Nicholls during the 1920s, show the British concern for an architecture with roots in the land. Both these housing complexes "share certain essential characteristics: they follow a classical U-shaped plan and they respond effectively to climatic conditions. The latter is best exem-

plified by the use of verandahs in the front and walled-in courtyards in the back, and by good cross-ventilation and high ceilings in the interiors."[6] This description has been given by Peter Serenyi, an American architectural historian, who also dwells on another housing complex, Sujan Singh Park of New Delhi, designed by Walter Sykes George in the early 1940s. He writes that "an important part in this large group of middle class apartment houses is built around an open green space using exposed red brick as its primary building material. It should be remembered that exposed brick was only rarely used in pre-colonial and colonial architecture of most of India. In fact, it was Walter George, together with such fellow British architects as Arthur Gordon Shoosmith and Sir Reginald Blomfield, who introduced exposed brick in Delhi."[7] These architects were fascinated by this material more than three decades before Pierre Jeanneret, Maxwell Fry and Jane Drew made it popular in India. Serenyi comments: "Walter George's handling of detail and building materials, especially brick, his sensitivity to function and climate, and his attentiveness to scale and context contributed to his becoming the most influential younger member of the original Lutyens team."[8]

The efforts of Blomfield, Shoosmith and George to bring in some sort of universality by rejecting traditionalist doctrine were backed by the European modern movement. These architects acted as agents to maintain a liaison between India and the West. Technological advancements in Europe initially had little impact on Indian architecture, yet by the 1930s the mainstream of the Western modern movement reflected the so-called international style. The advent of precast and pre-fabricated metal components like staircases, handrails, grills and frames had already initiated modifications and changes in the external expression of buildings. Exploitation of reinforced concrete as contemporary building material by those who supported the modern movement further supplemented this change of expression. A British architect, Robert Cable, who was working in India in the 1920s, declared concrete to be "a material that defies all the accepted canons of architecture and which is going to upset all the traditional forms which have grown out of the expression of construction, a material, moreover, the universal use of which... will tend to produce throughout the world one, more or less, universal and international style of architecture."[9] Modernism, according to its supporters, was not a superficial style but an embodiment of fundamental and universal principles. Thus they advocated it as a rational, functional and culturally neutral mode of building. About the international style, an Indian modernist, R.S. Deshpande, an engineer by profession and the author of a popular series of books on house design, wrote that "it was not a revolution which was sweeping over the Western countries, but a natural, inevitable evolution."[10] He further pointed out that "the *esprit moderne* consists of functionalism and simplicity and devising new methods of construction to suit new materials... To copy the productions of historical periods is not to maintain traditions of those periods at all. They were suitable for those times only."[11] He insisted that modern architecture was "more in keeping with the fundamental principles of true architecture than the conventional architecture which we have long been accustomed to. Modern architecture seems to transcend not only the limitations of time and space, but even national traditions and bias. It is not the property or patent of any particular body of any one nation, but a universal art offering boundless scope for development."[12] About the aesthetics of the international style, he judged it to be "most suited to our country. In the first place, it is in keeping with our philosophical ideal, viz. 'plain living and high thinking'... in a land of sunshine with a contrasting effect of light and shadow, bold, clear-cut features with smooth, sweeping lines present a more effective appearance."[13]

St. Stephen's College, New Delhi



## POST-INDEPENDENCE PERIOD

### State of the Profession

Independence brought with it the kind of enthusiasm which marks the beginning of a new era of cultural, social, political and economic development. Architecture, the physical manifestation of all these changes, was at the crossroads in India. There were only two schools or teaching institutions of architecture and about 300 qualified architects in the country to serve a population of 330 million. By the beginning of the 1970s the number of schools had grown to 15 and that of architects to more than 5,000 for a population of 550 million. By the mid-eighties, to a maximum stretch, only 10,000 architects were available for 750 million people which works out to one architect for every 75,000 persons—quite a low ratio as compared to the one prevailing in developed countries like the United States of America and Great Britain. But the India of today teems with about 40 schools of architecture, turning out almost a thousand graduates every year.

For the development of the architectural professionalism and to deal with matters relating to education in this field, at the time of Independence there existed in the country only one professional body of architects called the Indian Institute of Architects with its headquarters in Bombay. It was formally started in 1917 as the Architectural Students Association. Its name was changed to the Bombay Architectural Association in 1922 and finally to the Indian Institute of Architects in 1929. It remained affiliated to the Royal Institute of British Architects from 1925 to 1968, in which year the President of India became its patron. It is now a member of the International Union of Architects, the Commonwealth Association of Architects and the Architects' Regional Council of Asia. The Architectural Students Association had a humble beginning, with a membership composed of former students of the J.J. School of Art in Bombay. In 1929, when it grew to the stature of an all-India body, it had a membership of a little more than 150 which rose to just 260 by the mid-fifties. At present it has a membership of more than 6,000. The institute has enlarged its operational network with several chapters and centres all over the country.

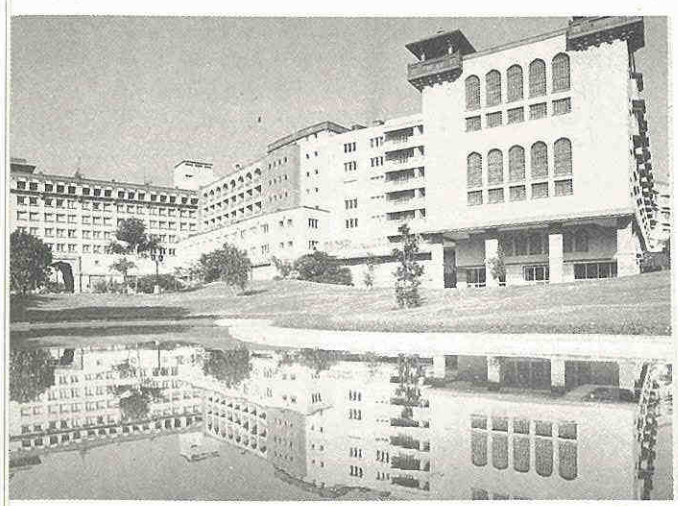
The Institute helps in promoting the architectural profession in India by formulating guidelines for practice like code of conduct, articles of agreement, conditions of engagement and the scales of professional charges, besides sponsoring design competitions, exhibitions, conferences and seminars. It also renders professional advice to the government, semi-government and private organisations in fields related to architecture. The Institute pioneered the Architects Act, which was passed by Parliament in 1972 and is considered a landmark in the history of the profession. By virtue of this Act, only such qualified architects can practise in the country as have registered themselves with the Council of Architecture. Though the process of introducing the Architects Bill was initiated in 1946, it gained momentum and impetus only in 1967 when the Commonwealth Association of Architects, in a conference held in Delhi, passed a strong resolution emphasising its urgent need. Finally, it was with the untiring efforts of Mr. Piloo Modi, Member of Parliament and noted architect, that the Bill was passed by both the Houses of Parliament and was subsequently accorded assent by the President on May 31, 1972. The Act came into force on September 1, 1972.

### Architecture after Independence

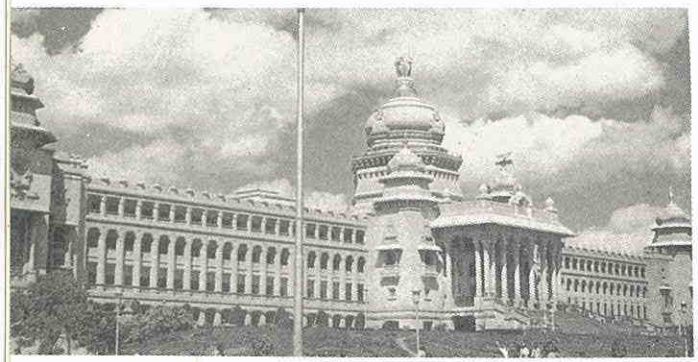
Immediately after the attainment of Independence from the British, there prevailed a higgledy-piggledy scenario in the field of architecture. The horizons of architecture for the new nation were as yet hazy and the subject was hotly debated in order to arrive at some clarity of the goals to be pursued. The top officers of the newly formed Indian administrative set-up wanted to play a safe game and, thus, were not keen to deviate from the lines already established by their British predecessors. Others, mainly young intellectuals, architects and critics, were opposed to this traditional approach and passionately pursued modernism in order to achieve a sense of universality. They termed the Indo-European style absurd in the context of contemporary needs. The early post-Independence period thus marked the beginning of two styles of architecture—broadly speaking the revivalist and the international. The former was an extension of the late Indo-European style and, like its prototype, laid emphasis on form and external expression. It embodied the efforts to evolve built-forms appropriate to contemporary needs, yet bearing a resemblance to traditional architecture. This was often achieved by providing superficial envelopes for traditional decorative motifs on the otherwise contemporary structures. To make the buildings look presumably Indian, the horizontal, straight skylines were customarily broken by capping the rooftops with superfluous domes and kiosks. The international style, on the other hand, was the outcome of a rational approach to design, unhampered by historical or cultural restraints. It had a distinct expression with free facades, unembellished planes, long horizontal glazed windows and contemporary sun-shading devices.

Ashoka Hotel in New Delhi (1955-56), was designed by B.E. Doctor and is a bold and striking specification of the revivalist school. It incorporates traditional features like latticework *(jaalis)*, rooftop kiosks *(chhatris)* and ornamental brackets to create "a product of Indian traditional design harmoniously blended with the present-day comforts and amenities of the West,"[14] its architect records. The Supreme Court building, also in New Delhi (1954-58), was designed by architects of the Central Public Works Department. It is a continuation of the architecture of the Capitol Complex of New Delhi.

Another example of the revivalist movement is the Vidhan Saudha at Bangalore (1952-57), which houses both the State legislature as well as the secretariat. Built by the State Public



Ashoka Hotel, New Delhi



Vidhan Saudha, Bangalore

Works Department under the close supervision of the then Chief Minister, Mr. Kengal Hanumanthaiya, it is a four-storeyed rectangular structure in granite, replete with towering columns and captivating frescoes and carvings.

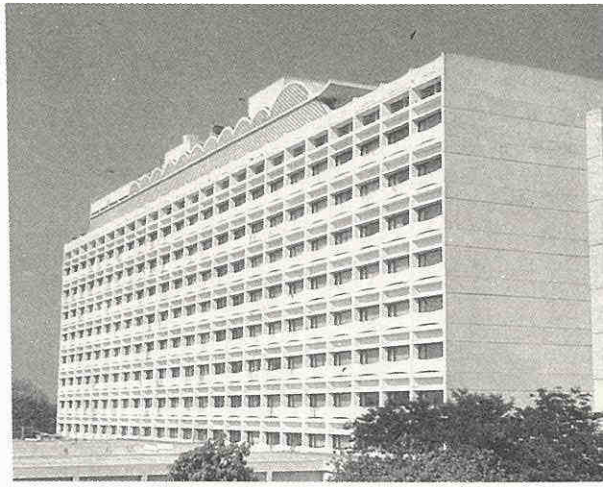
The Vigyan Bhavan in New Delhi, with its plain cubical mass and a conspicuous entrance under a green-marble Buddhist arch, presumably symbolising an Indian identity, also falls in the post-Independence revivalist category.

Golconde House in Pondicherry, designed by Antonin Raymond, was one of the first buildings to represent the international style. It was conceived in 1936 but completed in 1948 after a protracted period of construction. This dormitory incorporated new architectural features like adjustable horizontal louvers on its vertical surfaces for sun protection and precast thin shell concrete vaulting to create a ventilated double roof for heat insulation.

Walter George, who lived in India even after the construction of New Delhi, also switched over to the new vocabulary of the international style. His T.B. Association Building in New Delhi (1950-52), with an independent facade of adjustable lightweight, horizontal sun-breakers was in sharp, distinct and clear-cut contrast to the revivalist style. This, coupled with the Golconde House, marked a new era in Indian architecture.

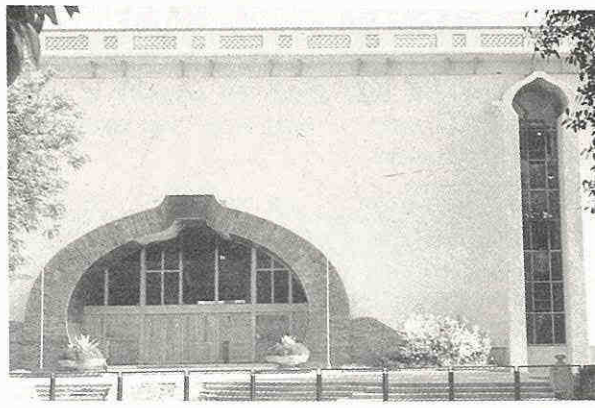
Habib Rahman's New Secretariat in Calcutta (1944-54), a reinforced-concrete-frame structure with pile foundations, louvers, elevators, fire-fighting systems and other modern services, Achyut Kanvinde's ATIRA building in Ahmedabad (1950-52), with long horizontal windows, Durga Bajpai and Piloo Mody's Oberoi Hotel in New Delhi (1951-58), with well-integrated services and the structure of precast concrete beams, slabs, louvers and balcony railings are some of the illustrations of the international style.

Skyscrapers, which were restricted to the United States before the World War II, were also introduced in India after Independence. These came into existènce because of intense urbanization and rising land prices, even though these were considered necessary evils. A noted American author, Norma Evenson, made this observation about skyscrapers: "For its early proponents, the skyscraper seemed the inevitable fruition of modern technology, and destined to characterize the modern city. The seductive symbolism of the high-rise building was to have particular appeal in the Third World, where, in spite of their costliness, technical problems, and cultural inappropriateness, such structures would often be prized as visible evidence of progress."[15]

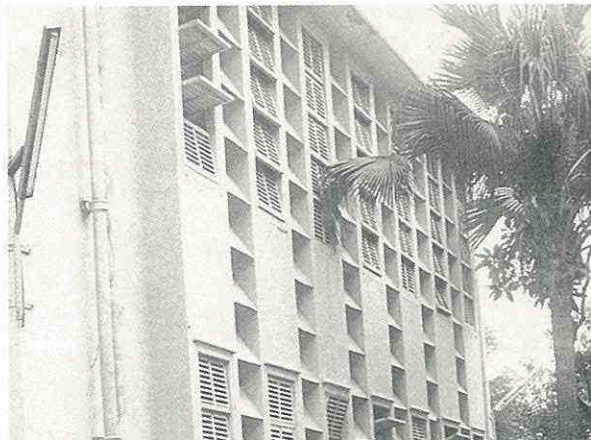


Oberoi Hotel, New Delhi

Vigyan Bhavan, New Delhi



T.B. Association Building, New Delhi



ATIRA Building, Ahmedabad

Chandigarh, the new capital of Punjab and one of the greatest experiments in the fields of town planning and architecture, was conceived in 1950. Mahatma Gandhi's demise had ended resistance to the lure of Western ideas and India opted almost decisively for a techno-industrial mode of development in opposition to the path shown by the "Father of the Nation,"—the path of grassroot development using indigenous technology. Prime Minister Jawaharlal Nehru vehemently patronized the creation of Chandigarh, although it was ultimately designed by foreign architects. Swiss-born French architect Le Corbusier was invited to design the new city. He had not only been a leader of the European modern movement since the 1920s but was also one of the creators of the international style, although his later buildings were characterized by bold sculptural forms in exposed reinforced concrete. Le Corbusier designed only the Capitol Complex in detail, distributing much of the additional work to other modern architects like Pierre Jeanneret, Maxwell Fry and Jane Drew. Chandigarh had set the pace for the emergence of modern architecture and provided a wide spectrum of topics for planners, architects, engineers and administrators to think, discuss, criticise and to appreciate. About Chandigarh, Jawaharlal Nehru said in 1959: "Now I have welcomed very greatly one great experiment in India which you know very well—Chandigarh. Many people argue about it, some dislike it, some like it. It is totally immaterial whether you like it or not; it is the biggest thing, because it makes you think. You may squirm at the impact, but it makes you think and imbibe new ideas. And the one thing that India requires in so many fields is to be hit on the head, so that you may think. I do not like every building in Chandigarh. I like some very much, I like the general conception of the township very much. But what I like above all this, is the creative approach—not being tied down to what has been done by our forefathers and the like, but thinking out in new terms; trying to think in terms of light and air, and ground and water and human beings, not in terms of rules and regulations laid down by our ancestors. Therefore, Chandigarh is of enormous importance, regardless of whether something in it succeeds or not...."[16] The truth in his words was brought out by the fact that Chandigarh, during the past four decades, obsessed our architectural psyche and there was hardly any professional talk, seminar or symposium in the country which did not express a haunting awareness to the architectural modernity of Chandigarh.

Le Corbusier was also invited to design Sanskar Kendra, the Headquarters of the Millowners Association, and some private residences at Ahmedabad. It afforded him another opportunity to extend his influence to a city which also became the site of the Indian Institute of Management, the campus of which was designed by the American architect Louis Kahn in 1962. Kahn used brick extensively and helped in promoting this material to an exalted status in the vocabulary of modern architecture in India. "Although the designs of Le Corbusier and Kahn were sometimes controversial, their work embodied a vocabulary of powerful architectural images that seemed in many ways timeless and universal. Their use of materials, moreover, gave their work a certain suitability to India. In a land where building maintenance was often lacking, and where surfaces were subject to strong weathering, brick and concrete seemed feasible alternatives to the smooth, plastered surfaces of the International Style and of Art Deco,"[17] observed Norma Evenson. Louis Kahn and Le Corbusier had experimented with sun-shading devices such as inset balconies and *brise-soleil* to design their buildings to suit the Indian climate. By the time the major buildings of Chandigarh had been completed in the late 1950s, the influence of the international style had begun to ebb. Perhaps Le Corbusier's greatest immediate impact was to settle the debate between the revivalists and the fledgling modernists. Almost all the members of the first generation of architects after Independence were greatly influenced by this unique experiment and they based their design philosophy in Chandigarh and assiduously lived up to its architectural vocabularies. In a few buildings elsewhere, the inspiration was rather specific, as J.K. Chowdhury's Indian Institute of Technology campus, New Delhi (1961-84), Shivnath Prasad's Akbar Hotel, New Delhi (1965-69), and Rajinder Kumar's Inter-State Bus Terminus, Delhi (1969-71). These buildings echo the monumental scale and sculptural abstractions of Corbusier's monuments.

An Indian architectural critic, Patwant Singh, summed up the French architect's impact thus: "Corbusier's work in this country—Chandigarh, more specifically—shook India out of the architectural stupor it had been in since long. It needed that shaking. Not that India lacks design talent, but just that it was the right time to point to the possibilities which lay beyond our obsession with *burjis, chhatris* and domes. We were beginning to look on these forms as representatives of the Indian tradition, while ignoring the true definition of tradition: the creativity inherent in the sensitive temperament of a people. We had a tradition of creativity we were devaluing by plagiarising the past. Chandigarh was the catalyst which pulled us out of that rut."[18]

A stage, however, came by the mid-sixties when a few Indian architects began to examine their work and evaluate its relevance to our

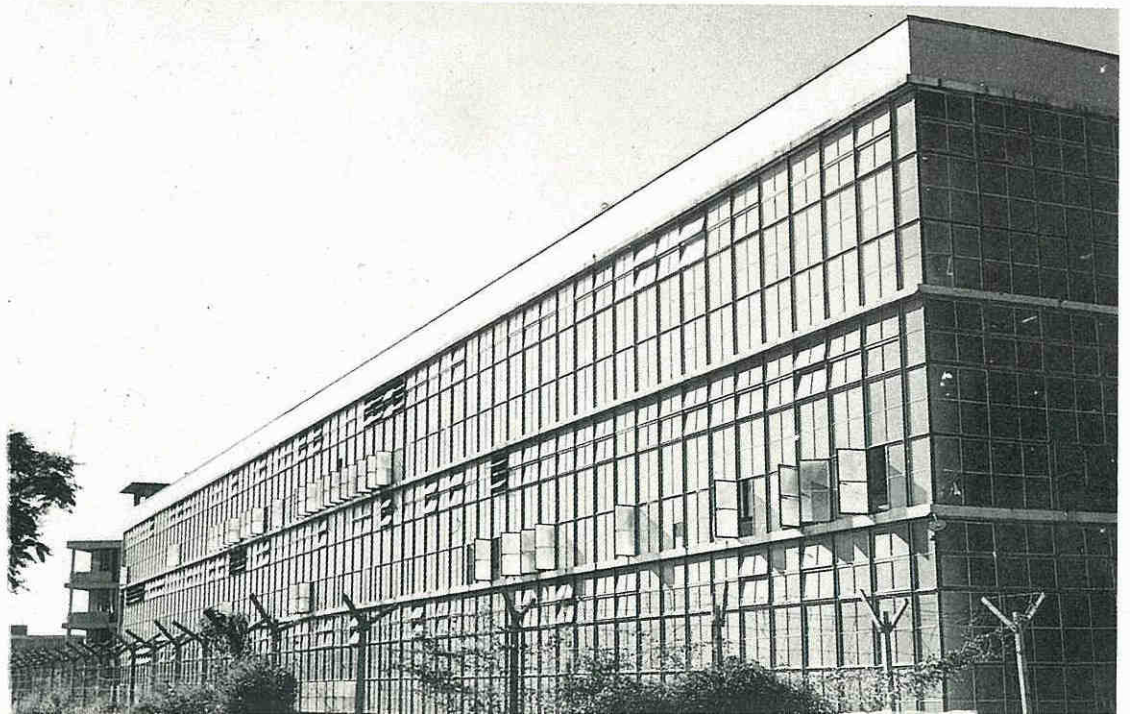
indigenous requirements. This led to a search for design solutions that were more relevant to our local needs and life-styles. Such Indian architects looked on the past as neither wasted nor purposeless but, enriched by its experience, saw in it the possibilities of rising to nobler attainments. They rejected such old vocabularies of the international style as uniformity of independent facades having no rationality with the functions inside, too much of glazed surfaces and concrete louvers, all which were found more ornamental than functional. The "outwards to inwards" approach to design changed to "inwards to outwards." In the revived situation, emphasis was laid on the function of the building and beyond that on the mode of life, the topography of the area, the climate and the character and soul of a particular region. The external images of the buildings were, therefore, to be more expressive of their inner functions. Yet, due to new methods of construction and universally used building materials like reinforced concrete, steel and glass, complete individualisation or regionalisation was far from achieved. Some sort of universality remained intact and this led to the emergence of a new style of architecture, more appropriately termed "internationalism."

Besides technology, the universalisation of modern functions further promoted internationalism. Numerous reinforced concrete structures of the 1960s and the 1970s fall in this category. During the past three decades it was internationalism which dominated the national architectural scene, and is likely to maintain this stature in the future. However, some variations in its external expressions have become necessary. The changing trends of external finishing in the past decade or so bears testimony to this apprehension. The natural concrete finish patronised by Le Corbusier and the exposed brickwork exploited by Pierre Jeanneret, Maxwell Fry, Jane Drew and Louis Kahn and followed by many others began to forfeit popularity due to the visible aging effect on the surfaces. It had become apparent that both concrete and brick suffered continual deterioration in the Indian climate. This gave way to a variety of other finishes, more durable and immune from the effects of the weather. Sandstone cladding of different colours and textures and stone aggregates became popular with the architects who were seeking a durable finish, and this changed the entire complexion of present-day architecture.

A new trend of high-technology architecture with complete glass facades is emerging slowly but surely. The Government Press building in Chandigarh, designed by Maxwell Fry in the 1950s is among the first evidences of this trend in India. After a lapse of three decades, the same emphasis reappeared in some stray examples in the 1980s, like Charles Correa's L.I.C. Building in New Delhi, Raja Aederi's Hotel Le Meridien, also in New Delhi, and the Mahindra and Mahindra head office at Bombay. How far is this lavish use of glass justified? What are we trying to achieve from it? Is it really a necessity or just a gimmick? Do our climatic conditions permit it? These are some of the issues which can be discussed and argued. Time alone will pronounce its mass acceptability or complete repudiation.

*Internationalism has dominated our national architectural scene over the past three decades and is likely to maintain this stature in the future.*

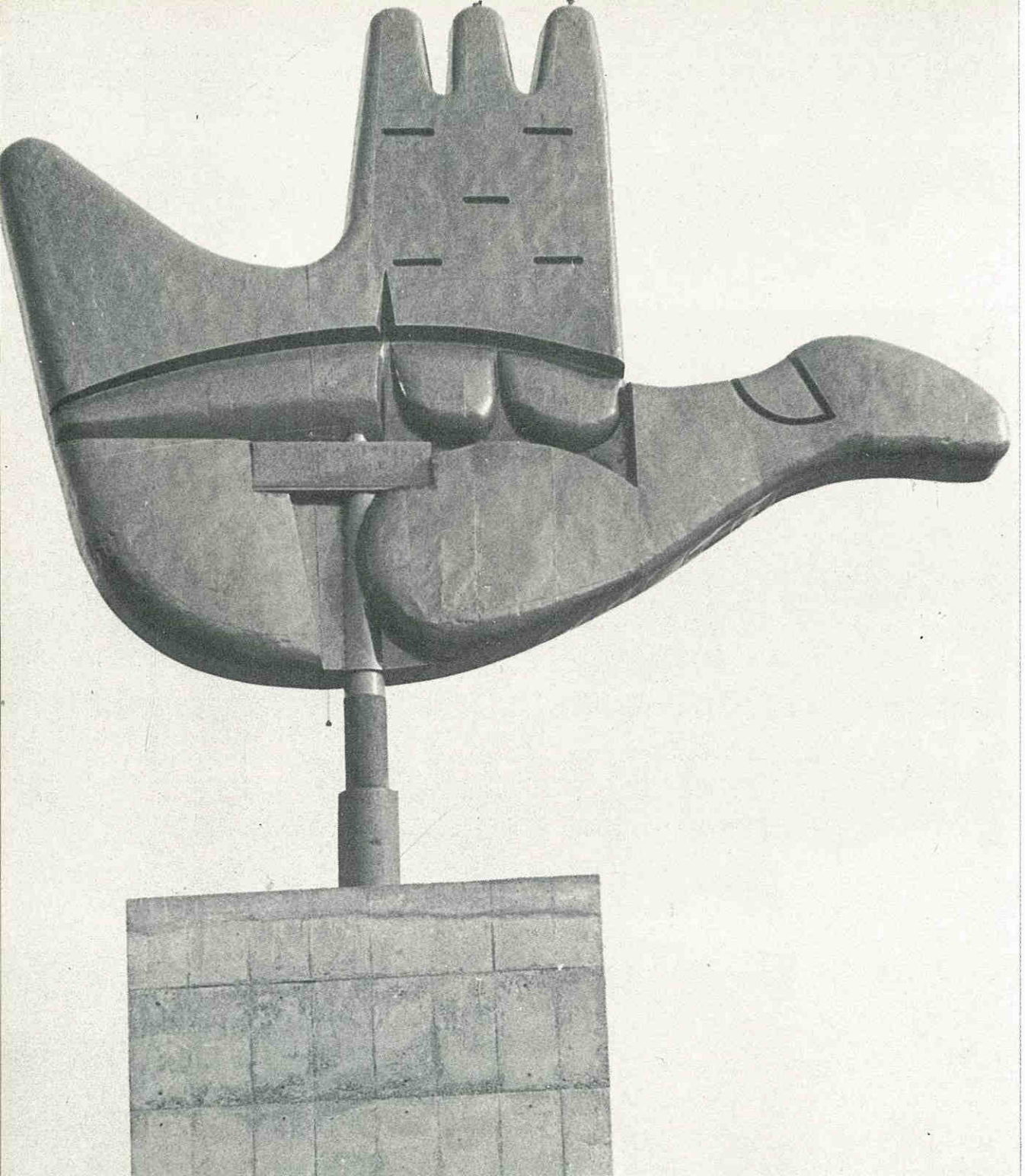
Government Press, Chandigarh



The past 15 years or so demonstrate a new awareness and a search for an Indian identity which many like to call "Indianism". The term in itself is as vague as the vastness of this sub-continent. Like India, with infinite facets, an age-old jigsaw of civilizations and innumerable cultural influences, its architecture cannot easily be reduced to a single unified vision. It simply defies generalization. From Kashmir to Kanniyakumari, from Gujarat to Assam, and from a tiny village to a metropolis, all kinds of architectural traditions can be found cheek by jowl. Each is important in its own way and none can pretend to embody the totality of Indian reality. "Regionalism" may thus be the more appropriate term. As against the universalisation of building materials, technology and functions, culture and climate are regionally rooted and express distinctive local characteristics. In spite of the general desire of the masses as well as that of the Indian government for an architecture which respects regional characteristics, local life-styles and the immediate physical environment, we have virtually failed to enunciate architectural principles for regions with a common culture, climate and tradition. The need of the hour is to analyse factors like climate, physical environment, social relations, materials and techniques which influence the architectural styles of each region and then to correlate these different factors to evolve design vocabularies rooted deep in the local ethos. These design vocabularies can then be incorporated in our architecture so as to make it vital, purposeful and relevant to the regional conditions and problems. Only then will our architecture instill confidence in our people and be recognised and accepted by them.

*Is the so lavish and extensive use of glass justified?*

LIC Building, New Delhi



The Open Hand—Chandigarh

# PROJECTS

CHAPTER 3

## Section I (1947-60)

## BHUBANESWAR (1948)

*Planner:* Otto H. Koenigsberger, London.

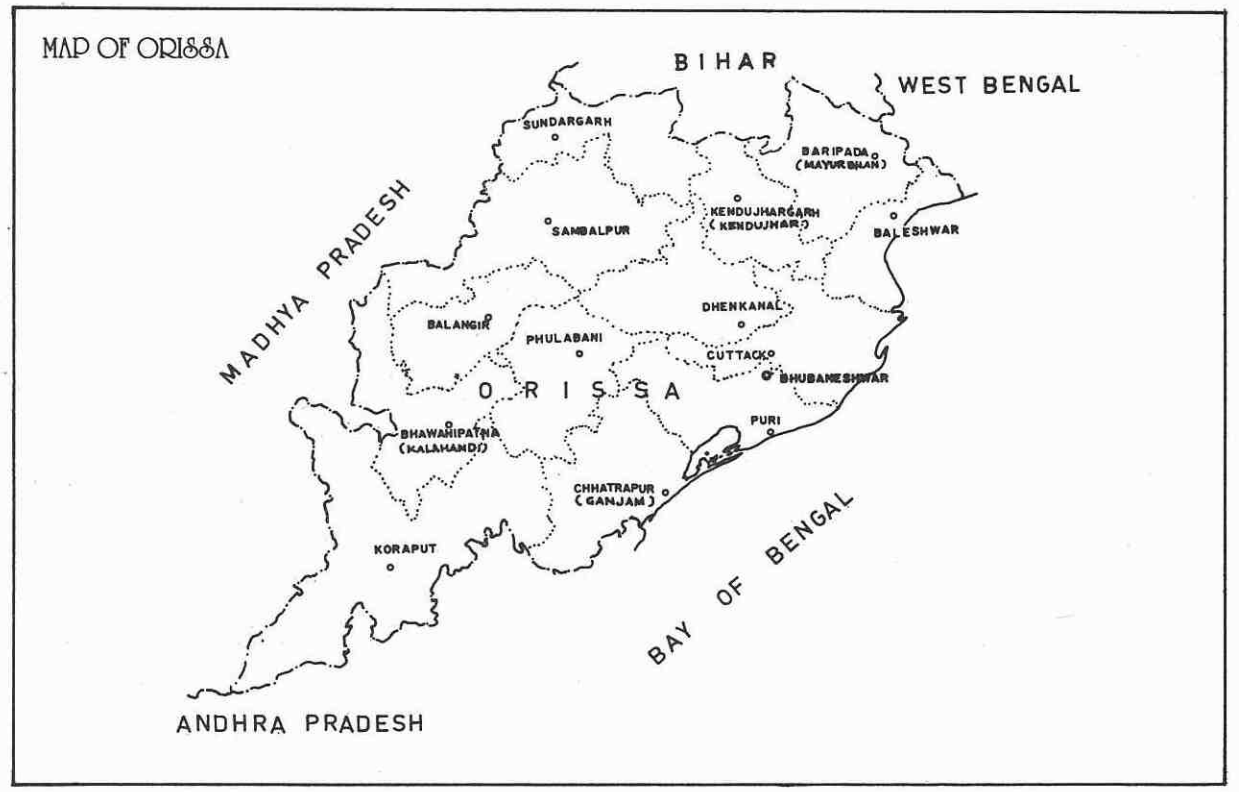
Bhubaneswar, the capital of Orissa, is located 48 km from the sea on the border between the fertile delta of the Mahanadi and the gently undulating and wooded hinterland of this State.

The site was selected in February, 1948 for the new capital. Site clearance work and the preparation of plans were undertaken simultaneously. The Prime Minister of India, Jawaharlal Nehru, laid the foundation stone of the city on April 13, 1948. Construction work started immediately after and in June 1949 a group of 800 government officials and their families shifted to permanent houses and temporary offices.

The site was characterised by certain salient features like an air field, a railway line and the original town of Bhubaneswar with a population of about 12,000 persons. Old Bhubaneswar is a major Shaivite centre of India and has more than 300 free-standing temple structures and a lake considered sacred. The main road of the new town is linked with the National Highway from Madras to Calcutta which bypasses the town to the north. The new capital has road links with Cuttack and Puri.

The capital was so planned as to serve as an administrative town for 50,000 persons. It was not conceived of as an industrial town. However, a small estate was ear-marked for light and service industries.

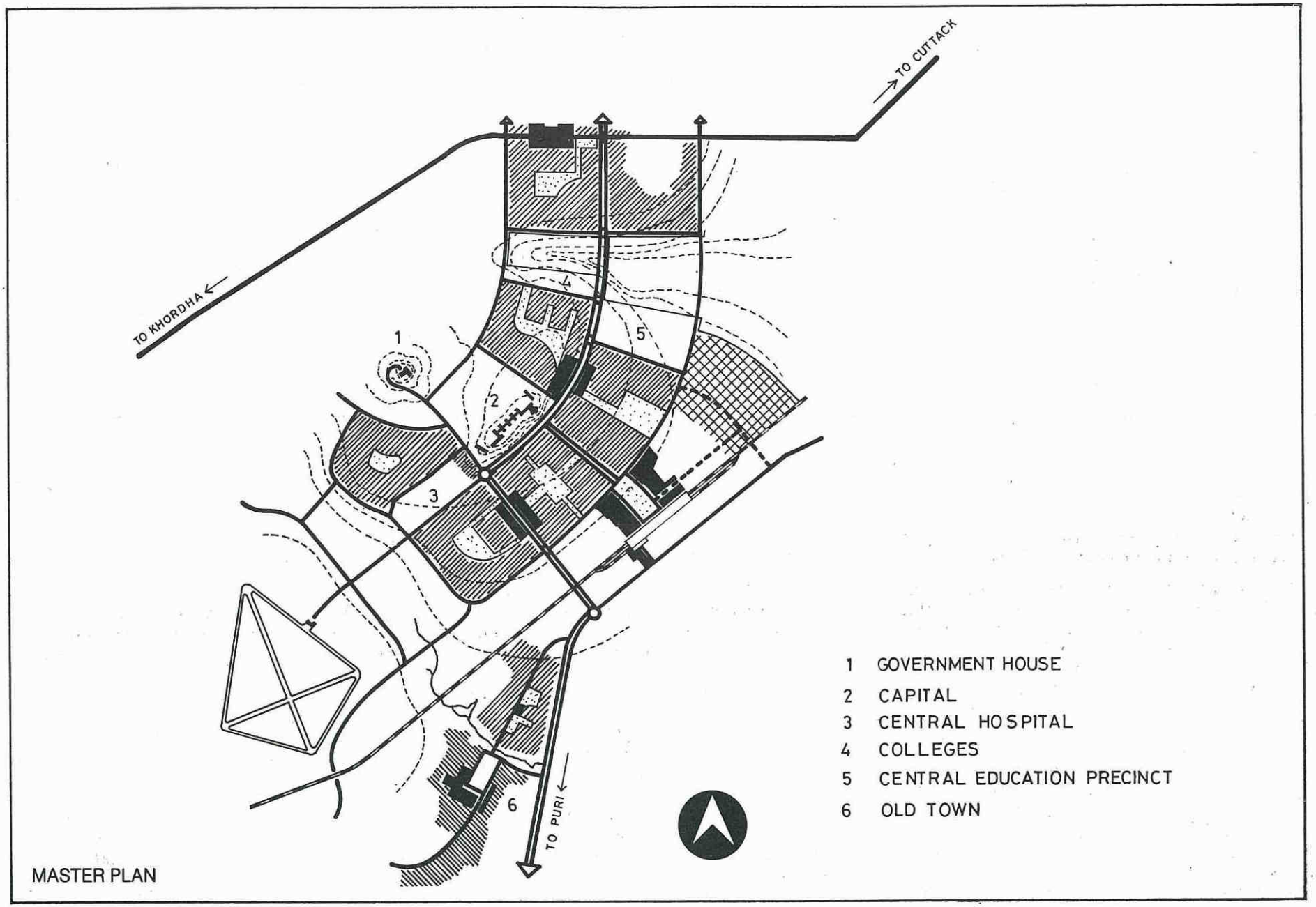
The Capitol Complex with the Assembly Hall and the Secretariat is located on a ridge, overlooking the residential areas on the eastern and southern slopes and is so designed as to receive refreshing breeze. The road network follows a T-pattern. The crossbar of the T links two rows of the residential areas while the stem of the T, forming broad avenue, connects the Capitol Complex with the business centre in front of the railway station.




Each residential neighbourhood is planned around an educational and recreational centre with open spaces for community functions. Local shopping centres for every two sets of neighbourhoods are grouped together with the intention of improving business prospects. A central shopping district has also been placed around the spacious station square to cater to the needs of the entire town. Every second housing site has been reserved for lease to non-officials to prevent the emergence of an "official ghetto". An attempt has been made to provide similar standards of urban amenities to both the old and the new towns, despite differences in their character and background.

New Bhubaneswar has grown much beyond Koenigsberger's plan for 50,000 inhabitants. By 1981 it had 2,19,211 people, including the inhabitants of the old town, which itself had increased to a strength of 34,000.

(By the permission of the author and the editor of *Town Planning Review*, Vol. XXIII, No. 2, July 1952)



## CHANDIGARH (1949-65)

*Architects and Planners:* Le Corbusier, Pierre Jeanneret (Paris), Maxwell Fry and Jane Drew (London)

After the partition of India in 1947, a search was launched to find a capital for East Punjab. Lahore, the capital of undivided Punjab, went to Pakistan as the capital of West Punjab. To select a suitable site for the Indian Punjab's capital, the State Government appointed a committee under the chairmanship of P.L. Verma in 1948. After a thorough survey, the existing towns were rejected for fresh development due to various reasons like shortage of water, defence vulnerability or inaccessibility. The committee felt that the existing towns, to which there was a tremendous influx of migrating people, would not be able to fulfil the needs of a state capital. Finally, it was decided to build a new capital city on an open site.

After considering various possibilities, the team of experts chose the present site, located in the submountainous area 260 km north of Delhi. The site was found suitable due to its fairly central location in the state, availability of sufficient water, its proximity to the national capital and an ideal gradient for natural drainage. With the Shivalik Hills in the background, this site also held promise of scenic beauty and imaginative landscaping.

Chandigarh, which owes its name to a temple of the Hindu goddess Chandi, has turned out to be one of the boldest experiments in architecture and town planning. The original site comprised mainly farmland, dotted with mango groves and encompassing 24 villages. It was bound by two seasonal *choes,* or rivulets—the Patiali Rao and the Sukhna—in the north-west and the south-east respectively. It extends in the north-east right upto the foothills of the Shivaliks. It lies on longitude 76° E48′ and latitude 30° N50′. Its altitude varies between 304.8 metres and 365.76 metres above sea level. The region experiences extremes in climate. The temperature could rise to 45° C in summer and drop to freezing point in winter.

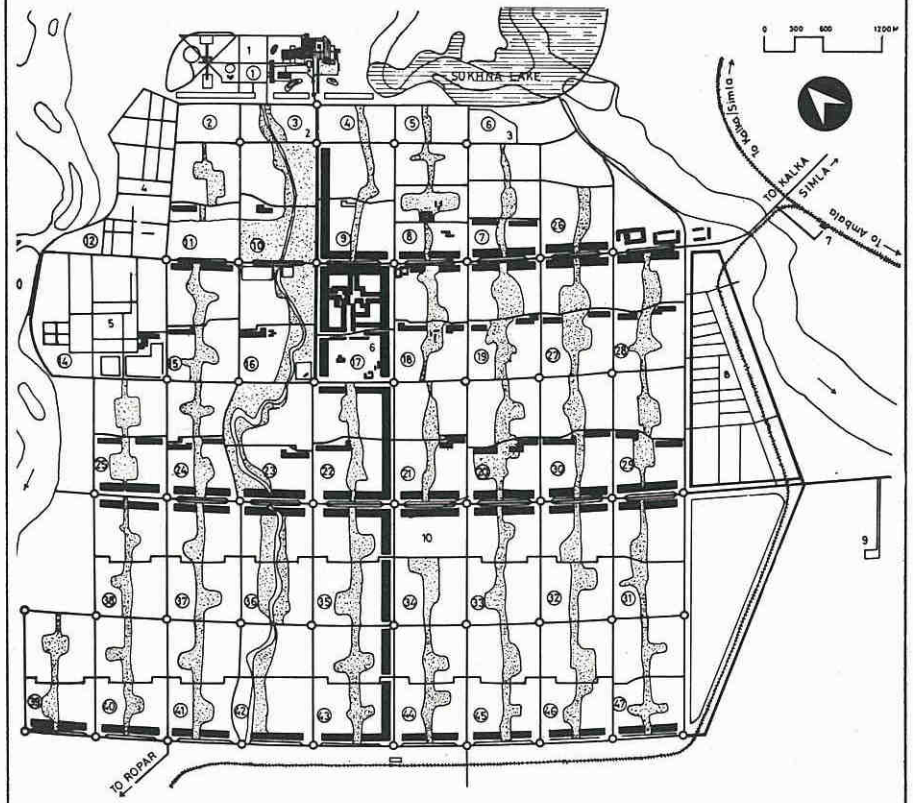
Supreme builders: Nehru and Corbusier

The direction of the prevalent winds is south-east to the north-west in summer and north-west to the south-east in winter.

Jawaharlal Nehru, the first Prime Minister of India, inspired the planners and builders of Chandigarh with the words: " .... this shall be the new city of free India, totally fresh and wholly responsive to the aspirations of the future generations of this great country, and that the city shall be free from all shackles and shall be unfettered by the traditions of the past—the city shall be so built and nurtured that it shall be a model for our glorious future growth of the country."[1]

Albert Mayer, a planner of the American firm Mayer, Whittlesley and Glass, was invited to design the new capital on the recommendation of Prime Minister Nehru. Other specialists were also engaged to plan the city's economics and transportation, utilities and roads and for site engineering and landscape design. Matthew Nowiczki, a brilliant Polish architect, was also invited to join the project. They prepared the first plan in 1949. But soon after, Nowiczki died in a plane crash and the town had its first setback. Mayer was heartbroken and reluctant to continue. This necessitated the selection of a new team. In 1950, a committee consisting of the State Administrator, P.N. Thapar and the

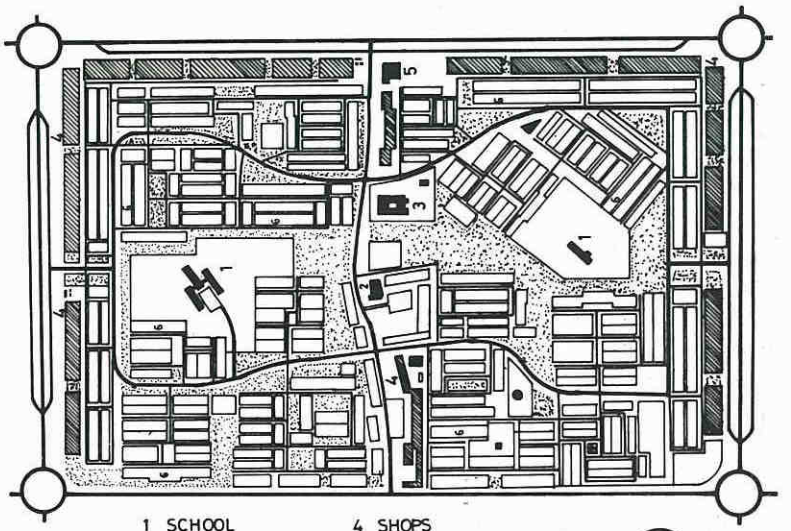
## MASTER PLAN (LE CORBUSIER)




SECTOR NOS. ARE INDICATED IN ○

1 CAPITOL COMPLEX
2 MLA'S HOSTELS/FLATS
3 RAJ BHAWAN
4 POST GRAD. MEDICAL INSTITUTE
5 PUNJAB UNIVERSITY
6 CITY CENTRE
7 RAILWAY STATION
8 INDUSTRIAL AREA
9 AIR PORT
10 SUB CITY CENTRE

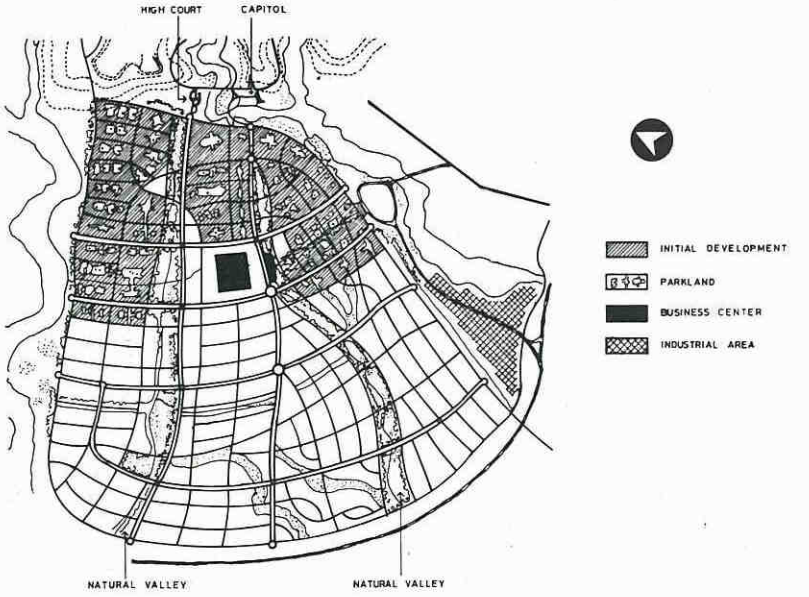
## SECTOR 22



1 SCHOOL
2 KIRAN CINEMA
3 HEALTH CENTRE
4 SHOPS
5 AROMA HOTEL
6 RESIDENTIAL

PLAN

## MASTER PLAN (MAYER AND NOWICZKI)



Chief Engineer, P.L. Verma, was sent to Europe to choose another team to design the new capital. After numerous interviews with important architectural firms in various countries, in November, 1950 they selected the French architect Le Corbusier, his cousin Pierre Jeanneret and the British architects Maxwell Fry and Jane Drew. Corbusier became Chief Architectural Adviser and took charge of developing the master plan, designing the Capitol Complex and establishing architectural controls. Jeanneret, Fry and Drew took the responsibility of designing housing, schools, shopping centres. hospitals and other civil structures, besides directing the actual construction. They were supported by a team of young Indian architects and planners. Maxwell Fry and his wife Jane Drew returned to practice in London in 1954 at the end of their three-year contract. Pierre Jeanneret stayed on as the Chief Architect and Town Planning Adviser until 1965.

The construction of the project started in 1951, and the city was inaugurated by Dr. Rajendra Prasad, the first President of India, on October 7, 1953. In 1966, political exigencies led to the further division of Punjab, the new state of Haryana being carved out of it. At present, as an interim arrangement, Chandigarh continues to function as the capital of both states. It was declared a Union Territory, primarily to avoid day-to-day conflicts in its administration, till certain political problems were solved.

## THE MASTER PLAN

Mayer and Nowiczki had prepared a master plan for a population of half a million. It is based on a system of low-density neighbourhoods defined by a grid of roads. The roads were slightly curved to follow the contours of the site. The planners felt that the major traffic arteries would appear dull and monotonous if kept straight. The Capitol Complex was proposed at the northern end of the city. The City Centre literally in the centre and the industrial sector in the east. Two natural valleys which run across the site were proposed to be developed as park strips. "Superblock" became the unit of housing, each with 500-metre by 1000-metre dimensions. Each superblock is made of three blocks which would contain housing, schools, shopping centres, etc. Three types of housing for low, middle and high-income groups were planned around a central green space. Different income groups were mixed intentionally to avoid rigid stratification. Nowiczki also conceived of another schematic plan of his own based on the organic form of a leaf. The stem of the leaf was compared with a commercial axis, which cuts through the centre of the city. Traffic arteries would branch out from this stem. He also planned one superblock to accommodate the low-income group.

## THE REVISED PLAN

Le Corbusier visited the site on February 18, 1951 and discussed the master plan with Jeanneret and Fry. He said: "The site is marvellous. It is a big chance to have such a view. I admire Thapar and Verma. They have seen the possibilities of this site. They are big men. The landscape all over will be open."[2] He further added: "The terrain chosen offers not a single difficulty of topography, not a single difficulty of subsoil, and the natural drainage of water permits the automatic irrigation of the limitless gre aswards of the new city. Such conditions permit the solving of the problems of the exact connecting of the organs of the city by arteries of circulation without the constraints which generally overpower the urban planner."[3] The Indian government gave the maximum possible freedom to the architects to design the new city, but shortage of funds, labour-oriented technology and variations in climate were constraints which played a major role in design. Corbusier once remarked: "India has the treasures of a proud culture, but her coffers are empty. We are making in India great things with hand labour, without machines. Besides the administrative and financial regulations, there was the law of the Sun in India; a calendar of sensational temperatures, extraordinary heat, 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(to ventilate), and third to evacuate rain water. This necessitated a real apprenticeship and an unprecedented adaption of modern methods."[4]

Corbusier duly considered the Mayer-Nowiczki plan, but introduced several major changes. The present plan did, nonetheless, adopt certain major features of the initial scheme. The socio-economic conditions and the living habits of the people ruled out the idea of vertical planning and it was decided to design a horizontal city, more or less on the pattern of a garden city. The master plan, which was to be realized in two phases due to economic constraints, catered to a total population of half a million. The first phase comprised 30 self-supporting units, known as sectors, covering an area of 3,642 hectares and catering to the needs of the 1,50,000 persons. The second phase was envisaged for a much higher density with 17 sectors spread over an area of 2,428 hectares to accommodate 3,50,000 persons.

Towns are biological phenomena, according to Corbusier, and they have a brain, heart, lungs, limbs and arteries like human beings. The Capitol Complex was placed at the top of the town because he likened it to the intellect of man, which emanates from the brain or the head. The industrial and the educational belts on either side of the city symbolise the limbs. The City Centre with commercial buildings, shops and offices represents the heart. The spacious parks and the green belts which run through the city provide the lungs. The network of roads for vehicular traffic and footpaths for pedestrians constitutes the circulatory system.

Corbusier simplified Mayer's curvilinear road system by adopting the gridiron pattern of straight roads because "circulation of traffic demands a straight line; ..... the curve is ruinous, difficult and dangerous; it is a paralyzing thing. The straight line enters into all human history, into all human aim, into every human act."[5] The lateral streets that are slightly curved is Maxwell Fry's contribution "to avoid boredom and mitigate the effects of low sunlight on

drivers."[6] The single processional approach, which links the body of the city with its symbolic head was bound on one side by multi-storeyed buildings and on the other by parkland. The other main road, which leads from the railway station and terminates at the university, changes in character as it proceeds. On the north-east side it has shop-cum-offices for business firms, the museum, the sports stadium and important educational institutions.

The Peripheral Control Act of 1952 was established to regulate development within a 16 km limit beyond the city. The purpose of such control was to prevent unplanned development on the city's boundaries and to protect the rural community from degeneration. It was intended to create a harmonious relationship between the urban dwellers and the rural areas, which could supply the city with farm produce like milk, eggs and vegetables.

The system of roads (Vs) symbolises the structure and discipline of a tree, hierarchically and progressively branching out from the stem to the leaf and proportionately reduced in size in accordance with the quantum of life juices to be carried. The roads V1 represent the regional highways leading upto the city from outside. The roads V2 take immediately the succession of V1s at the peripheries of the city and form the main axes. These are meant to give an experience of urbanity and, as such, cater to all classes of traffic—fast and slow moving vehicles, heavy or light, cycles and pedestrians. The roads V3 surround the sectors forming the grid pattern of the city. These are meant for fast-moving vehicular traffic with the least interruptions and no openings on them. The roads V4 are the shopping streets bisecting the sectors. These are meant for mixed traffic. The V5 loop roads intersect the V4s at two points in each sector. This assures the distribution of slow traffic inside the sector. The roads V6 give access to the doors of the residences. These are not meant to receive transit traffic. Finally, V7s are exclusive pedestrian paths running through the park belts of the city.

To cope with the growing traffic, the intersections of the V3 roads were planned for a four-stage development. In the first stage the intersection would consist of a round-about to which auxiliary turning lanes would be added in the second stage. An underpass is proposed in the third stage and, in addition, an overpass is planned to meet the final requirements. The roads have been named according to their attributes. The road V2 which leads from the City Centre to the Capitol Complex is called *Jan Marg* (people's avenue) and another V2 running north-west to south-east is named *Madhya Marg* (central avenue). *Uttar Marg* (north avenue), is the road which forms the upper boundary of the city. The less important arteries are termed *Path* (street). For instance, *Vidya Path* (street of knowledge) is a street bordering the university campus.

Rejoicing Discipline

Joy of Shopping


Le Corbusier wanted to have plenty of verdure and open spaces, describing them as the lungs of the city. A landscape committee, with Dr. M.S. Randhawa as Chairman and architects, engineers and planners of the Chandigarh project as members, was set up to guide the work. The foliage pattern for fast moving traffic arteries (V2 and V3) was conceived to suit varying sun conditions. The V2 which leads to the Capitol Complex is planted with high foliage trees which not only permit the eye to travel across an open vista but also help to demarcate the heavy traffic automobile roadway. The pedestrian footpaths on the sides are shaded by four or five rows of trees. The V3 roads which run from the north-east to the south-west are planted with evergreen trees with large umbrella-like foliage to form a green tunnel. To give direction to the users the V3 roads which run from the north-west to the south-east are planted with trees which have light foliage. To give a separate identity to the shopping streets, these were planted with a variety of flowering trees. The old trees, particularly mango, clumps of date and palm, "have been retained in the green belts, thus creating an illusion of great-age,"[7] as Dr. Randhawa put it. An informal pattern of planting has been adopted for parks. Besides having utilitarian and aesthetic value, the trees act as an effective buffer against dust and noise. The Leisure Valley runs the full length of the city from the north-east to the south-west. Developed in an eroded river bed, the valley contains a six-metre-deep seasonal, mostly dry, rivulet. The width of its slopes varies from 100 to 300 metres. The city's famous gardens have been developed in this valley. The valley not only acts as a unifying factor for the sectors of different densities and of diverse characteristics but also helps in draining the rain water out of the city. A seasonal river on the eastern side of the city was dammed to create

an artificial lake called the Sukhna. It was intended that this body of water would modulate the microclimate of the area as well as provide dramatic vistas of the Capitol buildings and mountains.

The Indian administrators connected with the project, who went to Oxford to streamline the plans, influenced the architects in the design of government housing. The Oxonian programme comprises 13 categories of individual dwellings—from Type 1 for the Chief Minister to Type 13 for peons. A 14th type with minimum accommodation has been designed for the poor. The architects were rigidly bound to follow the state planning directives regarding the cost and type of accommodation. To economise on land use and construction, the lower categories of houses were planned in rows with common walls. Type 7 is semi-detached and the higher types are fully detached. According to Maxwell Fry, "the housing in Chandigarh offered a character derived very directly from the new urban way of life in India, from the climate, and from the economics of the particular situation."[8] In North India with its severe winters and hot summers, there is the need for warmth in winter and for proper protection from the hot sun in summer. Indigenous devices have been developed to suit the tropical heat and to give to the houses a character of their own. Sun-breakers and *jaalis* (lattice-work) have been used to keep off the heat and yet provide sunlight and air. These elements add considerably to the aesthetic appearance of the houses. The houses are oriented in such a way as to keep out the hot summer sun, while the winter sun comes right into the rooms. Verandahs, courtyards and sleeping terraces have been included in most types of houses to protect them from the heat. The high cost of glazing as well as the unsuitability of using large areas of glass in such a climate have led to small openings so placed as to give the most effective light and ventilation to the interiors. The flat roof, which was customary in this part of India, has been employed because of its usefulness as a sleeping terrace and for other activities requiring open space. Locally made brick has been used for the load-bearing walls, parapets, balustrades, and sun-breakers. At times walls are left exposed, but often the brickwork is plastered as this permits inferior grades of the material to be utilised. Brick walls support a row of precast concrete battens on the roof level, which are bridged with brick tiles. This method has resulted in saving on shuttering expense and in speedy construction. In some of the houses, reinforced-concrete slabs or brick-vaulted roofs have been used.

The industrial sector is located on the south-eastern side, close to the railway station and the wholesale markets of the city. It lies spread over 235 hectares and was proposed to be developed in two phases. An additional belt in the southern part of the city was proposed for the third phase. Due consideration has been given to the convenient entry of raw materials and the exit of finished goods without disturbing the peace and tranquillity of the streets of the city. To keep the city free from pollution, it was decided that no industry which created pollution would be permitted. The entire industrial sector is separated from the residential areas by a buffer belt of fruit-bearing trees. The plot sizes in this sector were so laid out as to accommodate both large and small industrial units. The bigger industries either face the main roads or are near a railway siding for bulk handling. The area in between is filled with smaller plots to meet the needs of ancillary industries.

To sustain harmonious overall development and to eliminate haphazard growth, a number of architectural controls have been introduced. To ensure a unified street picture, a "frame control" has been applied to all residential plots upto 250 square yards. This law determines the extent and height of parting walls, limits the projection lines and prescribes the standard sizes of the doors and windows. Each house owner has to build a compulsory frame surrounding the house on all the sides. The internal design of the building is left to the choice of the developer. Architectural control over the commercial buildings along the shopping streets is exercised by supplying a design of the shop concerned to the plot holder. The residential buildings on such streets also have to follow standard designs but they are permitted to alter the interiors. The control on the architectural treatment and construction of the exteriors is applicable to all the buildings in the City Centre and to commercial buildings along the V2 avenues. A schematic design control was applied to the design of cinema halls and petrol stations. The gates and boundary walls too have to conform to standard designs, which adds to the unity of the street picture.

Apart from the byelaws which govern and lay down minimum standards of light, ventilation, living areas and sanitation, each plot of land in the city has been zoned by attaching to it a specific use and also controlling the building volume that can be developed on it.

## THE SECTOR

The basic planning unit of the city is a sector, 800 by 1200 metres with a population varying between 3,000 and 20,000, depending upon the size of the plots and the topography of the area. The dimensions of the sector are derived from a "modular" conception. Corbusier established a distance of 400 metres as a sort of outer limit of modular perception—a distance beyond which measures could not be readily grasped. He explained that "though the eye does not encompass a distance of 400 metres, the mind does conceive the distance of 400 metres, 200 metres, and, thence, the multiples of 800, 1200, etc. which automatically imply concepts of time."[9] Each sector is based on the concept of a neighbourhood unit which ensures necessities like shops, educational institutions, health centres, places of recreation and worship within a walkable distance. Introvert in character, a sector is bounded by fast-traffic roads running on its four sides and permitting only four vehicular entries into its interior. The continuous green spaces which stretch north-east to south-west contain schools and religious, cultural and community buildings. Each

house has its own open courtyard and each group of houses has a central open space. Although the plans of the sectors are not identical, they follow the same basic principles. Each sector has a central green which is bisected by a shopping street. A loop road which distributes the traffic in the interior of the sector intersects the shopping street. The individual houses are approached by streets which branch out from the loop road. The only exceptions are sectors 7 and 8 which, on the lines of Mayer's plan, have triple units. The architects established three main density groupings of 25, 50 and 75 persons per acre on the basis of their income. The low-density, high-income sectors have a residential pattern of detached houses. To achieve high densities, the low-income people are provided with terrace housing on small plots.

The shops are located along the V4 roads which run north-west to south-east across the sector. The markets of each sector communicate with those of the adjacent sectors, thus forming a continuous ribbon-like shopping street. The shops are located on the south-western side of the V4 road to protect them from the direct sun and to eliminate the necessity of crossing streets frequently. "A variety of shops were provided, so that both small shop owners and larger ones could be accommodated."[10] said Jane Drew. The buildings are designed as three-storeyed shop-cum-flats, with shops on the ground floor and residential accommodation on the upper floors for the shop-owners. This decision was taken keeping in view the Indian shop-owners' preference to live on their business premises. A continuous verandah runs in front of the shop. This not only protects the shops from rain and sun but also provides a shaded walkway for the customers. Single-storeyed booths are provided to meet the requirements of small shops.

## THE CITY CENTRE

The City Centre is literally located centrally in Sector 17, at the junction of two fast-traffic (V2) roads, one bringing in public transport and general traffic from outside the city and the other forming a ceremonial approach to the Capitol Complex. It spreads over an area of 97 hectares and is divided broadly into two zones.

Architectural discipline—Aerial view of the City Centre

The north-eastern zone is earmarked for major commercial and civic functions and the south-western zone accommodates the functions of the local administration. The entire commercial district, horizontal in character, is bordered by two rows of highrise buildings along its north-west and south-east edges. Planned to cater to the diverse needs of government and semi-government agencies, these buildings too have a controlled volume and facade. Their tilted axis not only helps in achieving a north-south orientation but also contributes a lot towards getting a rhythmic street picture. Access to these buildings as well as to the central district is through a slow-traffic loop road with large areas set aside for car parking, thus making the entire inner complex free from traffic hazards.

A central piazza, marking the crossing of two wide promenades running north-east to south-west and north-west to south-east, is the hallmark of the City Centre. Important civic and commercial buildings are sited around this piazza. Two overbridges (one of which stands constructed) passing through the buildings at the first level facilitate the movement of vehicular traffic across the City Centre without interfering with the pedestrian piazza below. To ensure uniform and orderly development, strict architectural and material controls are applied. Reinforced-concrete-frame structures provide flexibility in organising interior spaces. All the commercial buildings have a repetitive structural grid of 5.25 by 5.25 metres. They are 17.6 metres high with the external facade in exposed concrete finish. Large undulatory glazed surfaces are well protected from rain and the sun by compulsory verandahs all around. To break the monotony of concrete structures, a linear commercial strip which distinguishes the two zones is designed with a simple and functional facade in exposed brick.

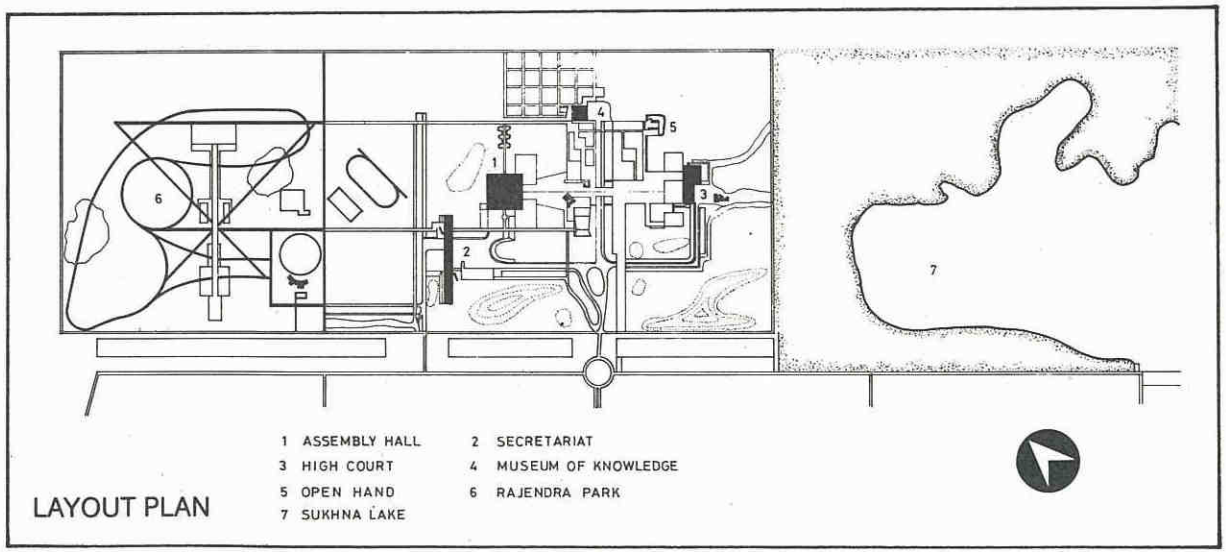
## CAPITOL COMPLEX, CHANDIGARH (1951-62)

*Architect:* Le Corbusier, Paris.

The Capitol Complex, which is at present the seat of the State Administrations of both Punjab and Haryana, is spread over an area of 100 hectares between the city and Shivalik Hills. The prominence accorded to this area symbolises the glorification of Independence attained after a long and sustained political struggle. The master plan is asymmetrical, symbolic of the democratic nature of the State. The main components of the Capitol are the Secretariat, the Assembly, the High Court, the Museum of Knowledge and monuments. To segregate pedestrian and vehicular movement, the land is arranged on two levels: a pedestrian plaza and five metres below it a level of roads and parking spaces. The plan is based on the architect's geometric predilections. As Corbusier saw it, "... it is natural, useful and pleasant to give this park a geometrical shape, ... Here is how it is done: a first diagram of two 800 metre squares. Within the left-hand square, another square of 400 by 400 metres. On the right-hand side the 800-metre square will be abandoned—its limits falling largely in the river erosion area — but a second square, 400 metres in depth, will be created and will adjust itself to its counterpart, already installed."[11]

The left 400-metre square contains the Secretariat, the Assembly and the Museum of Knowledge. The High Court occupies the second square of 400 metres on the right. A 450-metre-long pedestrian plaza penetrates into the area. The facade of the Secretariat on the left demarcates the edge of one of the 400-metre squares of the master plan. The Assembly and High Court buildings facing each other across the plaza terminate the cross-axis on either side. The Assembly is located symmetrically across the axial approach on the left side, whereas the High Court is located slightly beyond the axis. The Open Hand monument is placed at the outer edge of the complex. The Capitol Complex is studded with the Museum of Knowledge, the location of which was shifted to the left side of the approach road to the complex to make it a focal point without obstructing the line of vision. The spoil heaps of earth removed from the excavated grounds have been accumulated in several artificial mounds on which shrubbery is planted. The water bodies are planned to modulate the microclimate. The buildings, trees and hills are reflected in these ponds, thereby producing a pleasing effect. Another garden with a geometric layout is proposed near the Museum of Knowledge.

The 10-storeyed Secretariat houses administrative offices, those of ministers and of all ministerial agencies. It is a reinforced-concrete-frame structure, separated by five expansion joints into six distinct bays. Five of the bays are almost identical, whereas one, containing the double-height offices of ministers, has been so designed as to provide greater dignity to the elected representatives of the people. The offices are arranged on either side of a central corridor on each floor. Keeping in view the ever-changing needs of the government, the floor area is divided by removable partitions. The corridors have been provided with acoustical slits, a unique device to attain effective cross-ventilation and yet arrest the noise created by public movement. The building is oriented to obtain the maximum benefit of the wind direction for effective cross-ventilation and to cause minimum obstruction to the view of the Shivalik Hills from elsewhere in the city. Climate control in this building, with its enormous bands of glazing, is achieved by the provision of adjustable aerators set behind copper mosquito-netting. The undulatory glass-panels are well protected against the sun and rain by a grill of *brise-soleil* on the two principal facades. The Secretariat is topped by a roof-garden which has been designed not only to insulate the building against the direct rays of the sun but also to provide an excellent

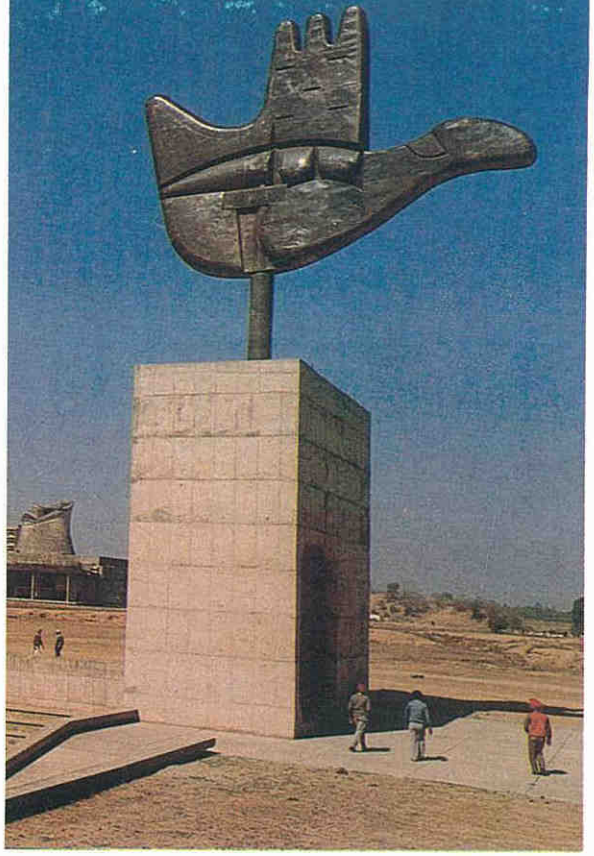


LAYOUT PLAN

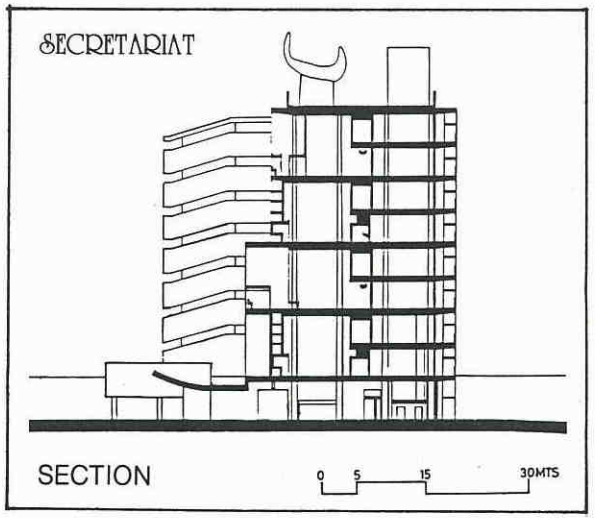
recreational place. A canteen has been built on the tenth floor so that the smell and fumes of the kitchen may not pollute the interiors of the building. The building is equipped with lifts and staircases. Two great ramps grow out of the building at a rakish angle. Their side walls have small openings to permit light and air.

The High Court symbolises three ideas in its structure—the majesty of law, the shelter of law and the power and fear of law. The building has an L-shaped plan and houses eight double-height small courtrooms and a tripleheight large high court on the ground floor with offices above each court. The courtrooms are identically expressed on the main facade facing an esplanade and are separated from the high court by a great entrance portico. Each courtroom is accessible individually to the public from outside. On the south-eastern side is the public entrance and a car park at a lower level. The continuity of the surface of the esplanade with the entrance portico sustains the unity of outside and inside. An emphatic colour scheme has been evolved to enhance the visual weight of this building across the plaza. The three pylons of portico rising 18.3 metres from the ground express the majesty of law. They are cement-rendered and painted respectively green, yellow and a pinkish red. The flanking walls are painted black. The working areas in the building are shielded by *brise-soleil* on the north-west and south-east facades. A double roof has been provided to protect the entire structure from the sun. The upper projecting roof in the form of a row of arches gives the feeling of the shelter of law. This parasol roof, which slopes towards the centre, provides a trough from which rain water gushes out through heavy spouts at either end. The space between the upper and lower roofs is left open to allow free movement of air, cooling the interiors considerably. A small serpent fountain at the entrance signifies the power and fear of the law. The building is constructed in exposed reinforced concrete which is treated in a variety of manners. The floor of the entrance portico is finished with stones which are set in rows of varying widths.

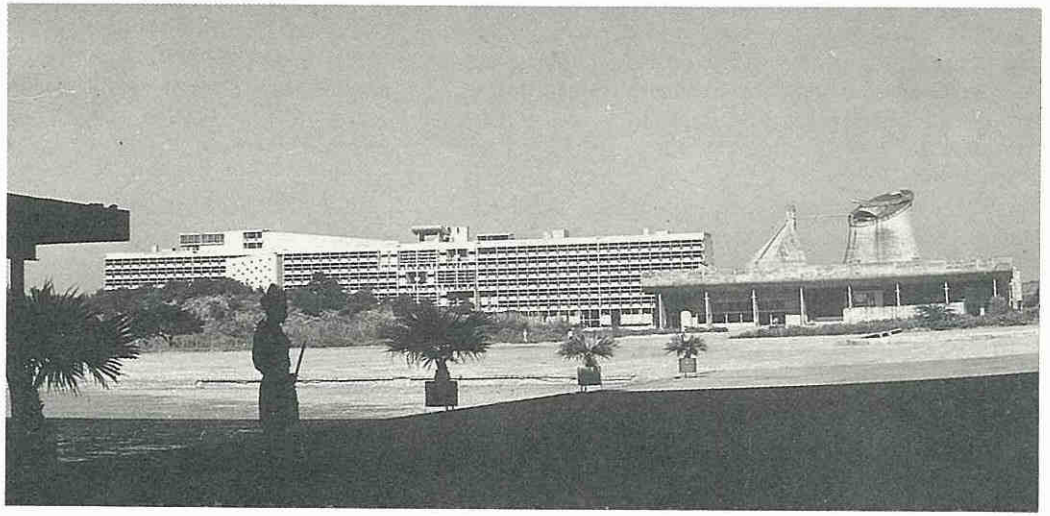
The Assembly Hall has a square plan. The Assembly Chamber, in the form of a hyperbolic shell, is surrounded by ceremonial space. This circulation space is planned as a dimly lit, triple-height, columned hall for informal meetings and discussions. On three sides a



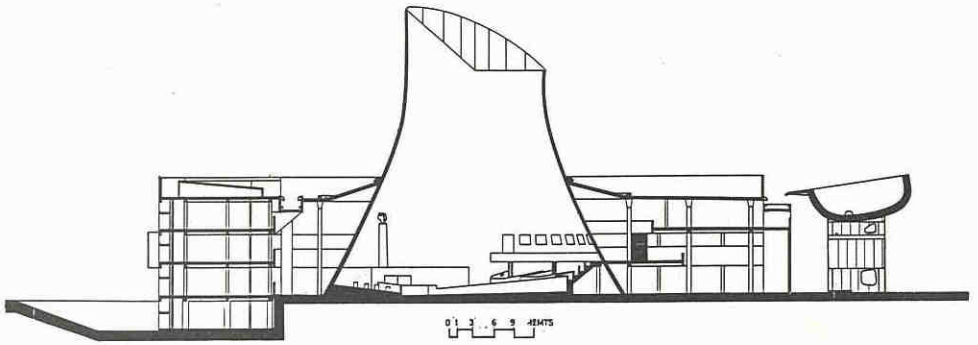
The Open Hand: Symbolic of giving and receiving




Secretariat and Legislature: A view from the High Court

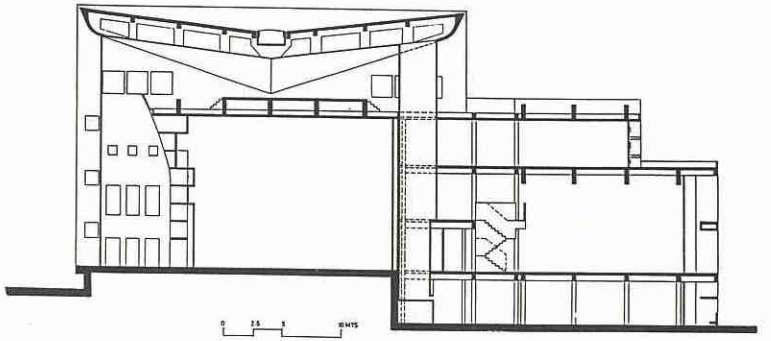


ASSEMBLY HALL



SECTION

HIGH COURT

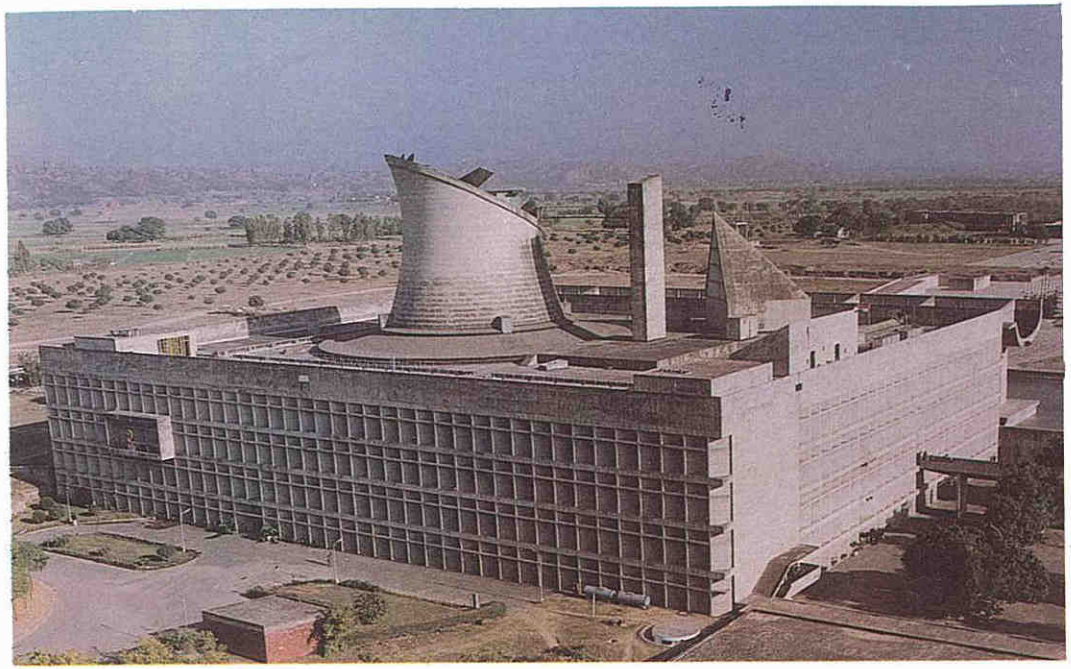


SECTION

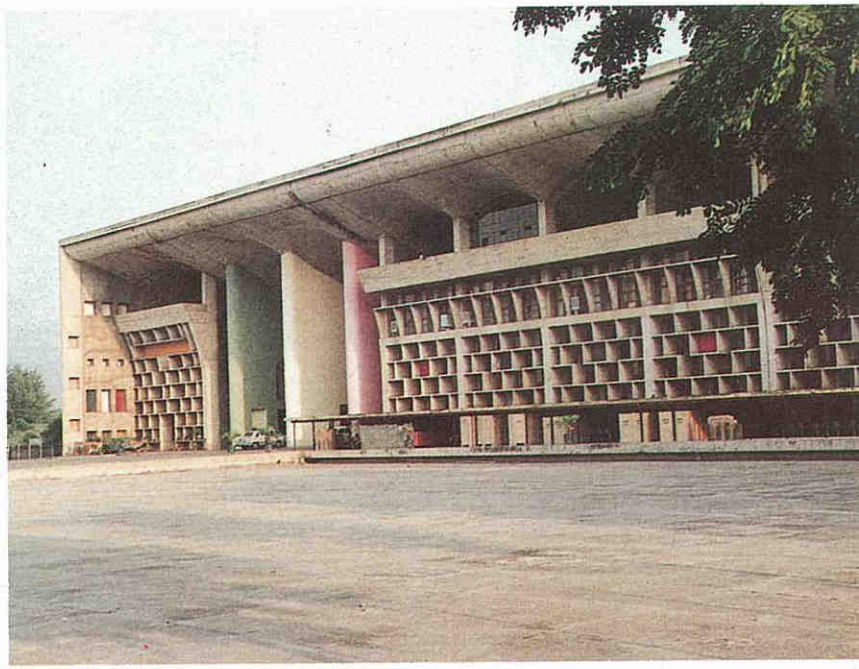
bank of offices is protected by *brise-soleil*. The great portico, on the fourth side, facing the High Court, consists of eight thin piers. These piers, which are perforated to frame glimpses of the Shivalik Hills, support a huge trough from which rain water spills out at either end, falling into reflecting pools. A ceremonial pivoting door is placed in an off-centre bay of the portico. Inspired by the form of the cooling towers of a power station near Ahmedabad, the architect designed the hyperbolic shell of the Assembly Chamber with a base diameter of 39.6 metres. This shell has a 38-metre height, terminating in an oblique section with a metallic framework at the top. This framework directs the interplay of natural and artificial lighting, ventilation and acoustics. The hyperbolic shell is only 15-centimetre thick, which helped in reducing the cost and the weight of the structure. The Assembly Chamber has a seating capacity for 252 persons. Additional galleries are provided for ladies, journalists and officials. An attempt has been made to modulate the dubious acoustics resulting from such a form, by sound-absorbing panels in bright colours and random curvilinear shapes. The Council Chamber, with a capacity of 70 seats, is crowned by a pyramid which admits light from the north into its interior. A ladies' gallery with 90 seats, a men's gallery with 104 seats and a press gallery with 24 seats are also provided in this chamber. Staircases, lifts and ramps provide various means of circulation and access to different levels of the building. The construction of the entire structure is in exposed reinforced concrete.

The architect proposed a Governor's Palace which would have crowned the Capitol Complex at the highest point, almost touching the foothills. But on the advice of Prime Minister Jawaharlal Nehru, the Punjab Government decided to use the circuit house as the Governor's Palace. Nehru felt that such a protensive building within the Capitol Complex itself was symbolically incommensurate with a democracy and therefore the idea was abandoned. As this decision could have seriously damaged the architectural composition of the Capitol Complex the architect came out with a fresh idea which took the form of the Museum of Knowledge. He suggested that for the future industrialisation and development of Punjab, research and study in various fields should be carried out in this building. The building envisaged offices, workshops, exhibition rooms, a reception hall and laboratories. It was to be a reinforced-concrete-frame structure, square in plan. The top level was designed as a roof-garden with a curvilinear outline and an upward lifting curve crowning the building against the Shivalik backdrop. However, as the ultimate utility of the building could not be clearly comprehended, this scheme too was shelved by the government.

The architect conceived of certain symbols which are installed in the Capitol Complex as monuments. These incorporate the theme of Corbusier's architectural philosophy and were envisioned to punctuate the cross-axis of the Capitol Complex. These monuments included



Legislature: Centre piece of Capitol



The High Court

the Martyrs Memorial, the Monument of Solar Hours, the Tower of Shadows, the Open Hand, the Trench of Consideration, the Modular Sculpture and the Harmonic Spiral. Besides these monuments, several other impressions of symbols are given in the concrete facades of the Capitol buildings. The Martyrs Memorial has been placed on the one side of the esplanade between the Assembly Hall and the High Court, defining an axial entrance to the Museum of Knowledge. It is dedicated to the memory of the martyrs of Punjab. It symbolises gratitude and is a reminder of the principles of sacrifice. It consists of a square enclosure with one side elongated into a ramp. Within the square there are a few symbolic sculptures proposed. The Monument of Solar Hours is located opposite the Martyrs Memorial. It consists of an artificial hill, geometric in form, with a diagram of the daily balance of light and darkness. Just beyond this monument is located the Tower of Shadows, demonstrating the architect's theories of sun control. It consists of a series of louvers oriented to the cardinal points. *Brise-soleil* is spread over three sides. The angled vertical louvers are designed on the eastern and western sides to cut off the sun. The southern side has straight vertical louvers. The spacing of the horizontal and vertical louvers is based on a scientific study of the angles of the sun round the year. Another small monument charting the course of the sun between the two solstices has been proposed adjacent to the Tower of Shadows. The Harmonic Spiral and Modular Sculpture are placed just to the right of the main pedestrian approach. The Open Hand, the most prominent monument, measures 12.5 by 9.0 metres. Apart from being an architectural cynosure, it defines the northern fringe of the Capitol Complex and upholds a man-made sculptural form against the backdrop presented by the natural ruggedness of the Shivaliks. It crowns an excavated plaza called the Trench of Consideration, conceived as a forum for debates on vital public affairs. Rising 27 metres from a sunken pavilion with seating arrangements around, the giant hand is designed to rotate on ball bearings fitted on a shaft, like a weathercock, to indicate symbolically the direction of the wind. Its surface is covered with polished steel grey metal sheets. It expresses non-violence as an open hand cannot hold a weapon. As Corbusier saw it: "The Open Hand symbolises—open for receiving the created richness—open for distribution to her people and to others. And still more it is the blessing hand of the Almighty for peace and prosperity. The Open Hand will affirm that the second era of mechanist civilization—an era of harmony—has started."[12]

## SANSKAR KENDRA, AHMEDABAD (1953-57)

*Architect:* Le Corbusier, Paris.

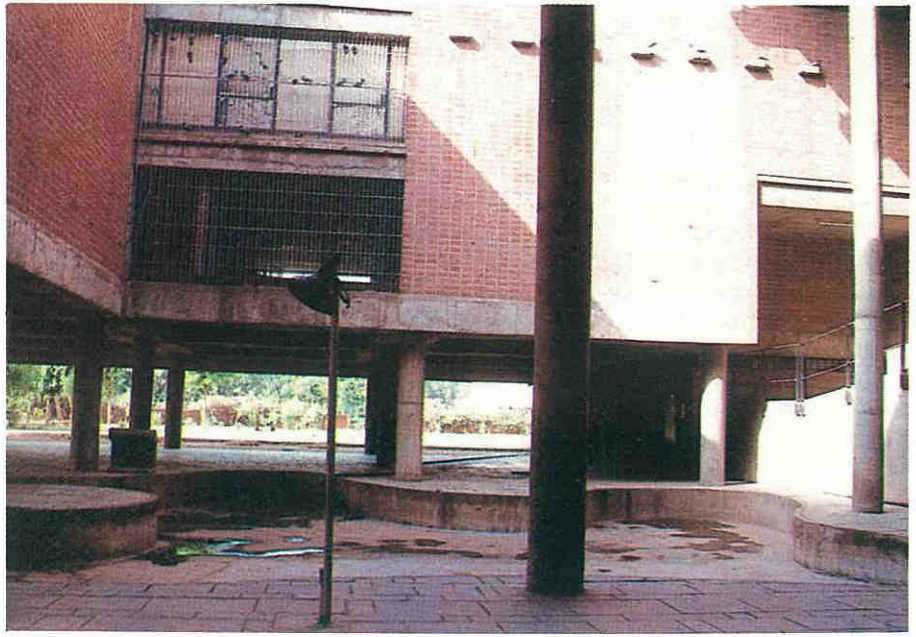
The Sanskar Kendra is located in the Paldi area of New Ahmedabad on the western bank of the River Sabarmati.

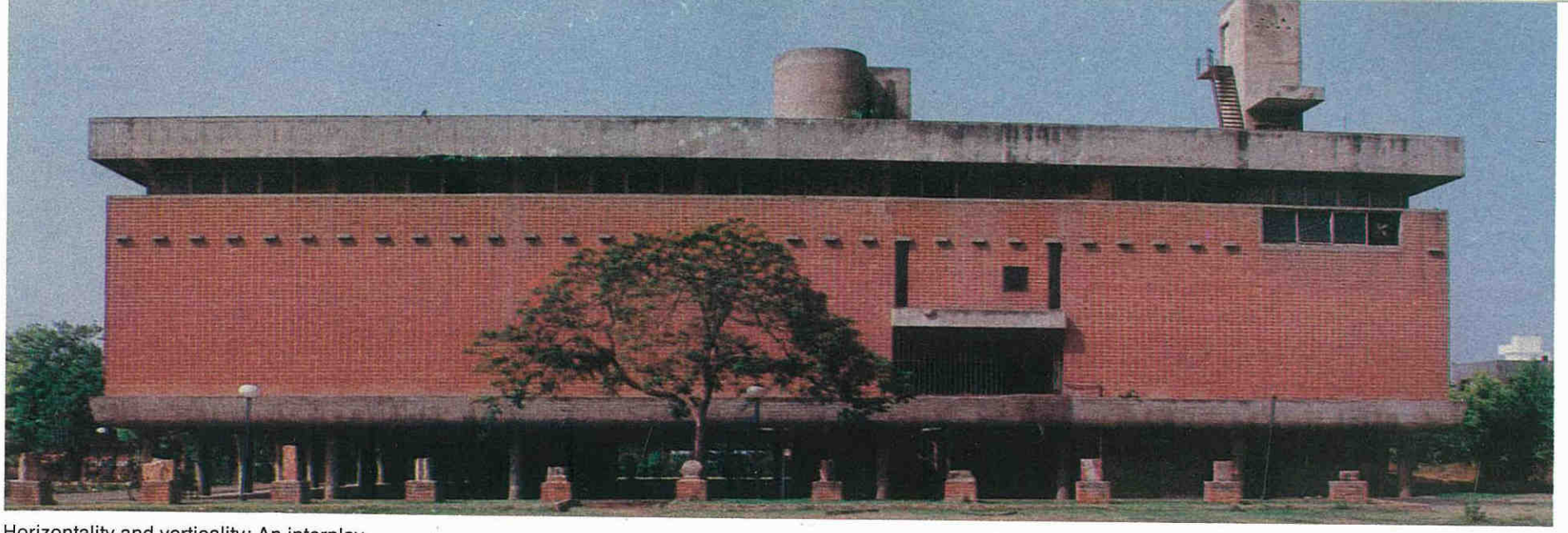
The design is based on the architect's concept of a museum of unlimited growth, featuring a square spiral using standardised structural elements and an open court in the centre. The museum, with a hollow box-like form, stands on stilts with centre-to-centre distances of seven metres along both axes. The main exhibition space is on the first floor level and envelopes an open court in the centre. Relieved by a free-shaped water body, this central court, together with the void created by the stilted volume, has helped in ensuring the free flow of cooled air inside the building. A ramp in this court provides access to the exhibition areas above. To deal with the rigours of the climate, the architect envisaged a roof-garden (not realised) containing 45 shallow water pools arranged in a grid-iron pattern—reminiscent of the Mughal gardens—and shielded from the sun by the shade of thick vegetation around them. The interiors are well illuminated to provide uniformly subdued light in the general circulation areas and sharply accented light in the display sections. The present block of 50 by 50 metres can be extended upto 84 by 84 metres by adding standard structural units on the periphery. Besides, there is a provision for separate blocks for anthropology and archaeology wings and a conference hall. These will be approachable either through the main block or through independent stairways.

The building is in reinforced-concrete frame with exposed brick-face surfaces both outside as well as inside the court. These external surfaces are thermally insulated by the climbers grown in a concrete trough running all along its periphery. All the internal surfaces are cement-plastered and whitewashed.

Massiveness: The illusion of floating

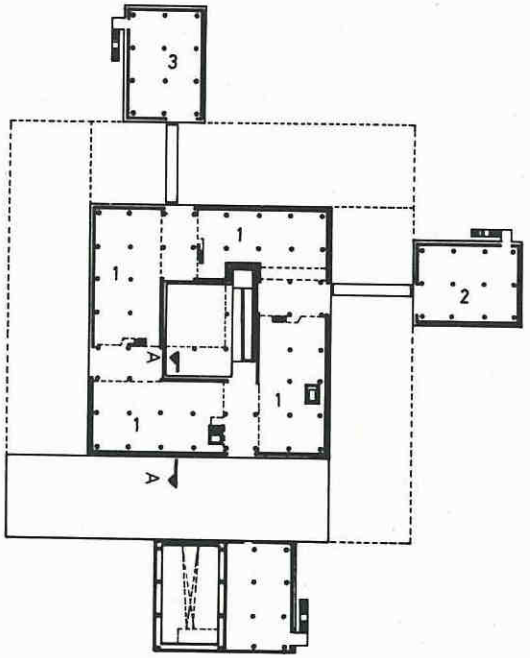
Free-verse architecture.





Horizontality and verticality: An interplay

1. DISPLAY ROOM
2. ANTHROPOLOGY ROOM
3. ARCHAEOLOGY ROOM

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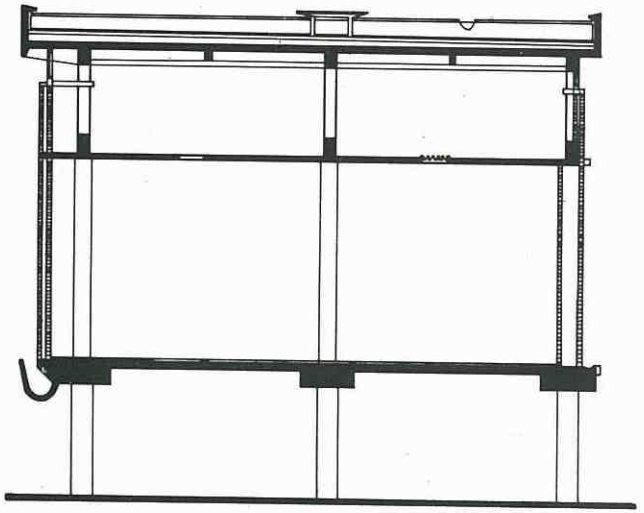


SECTION

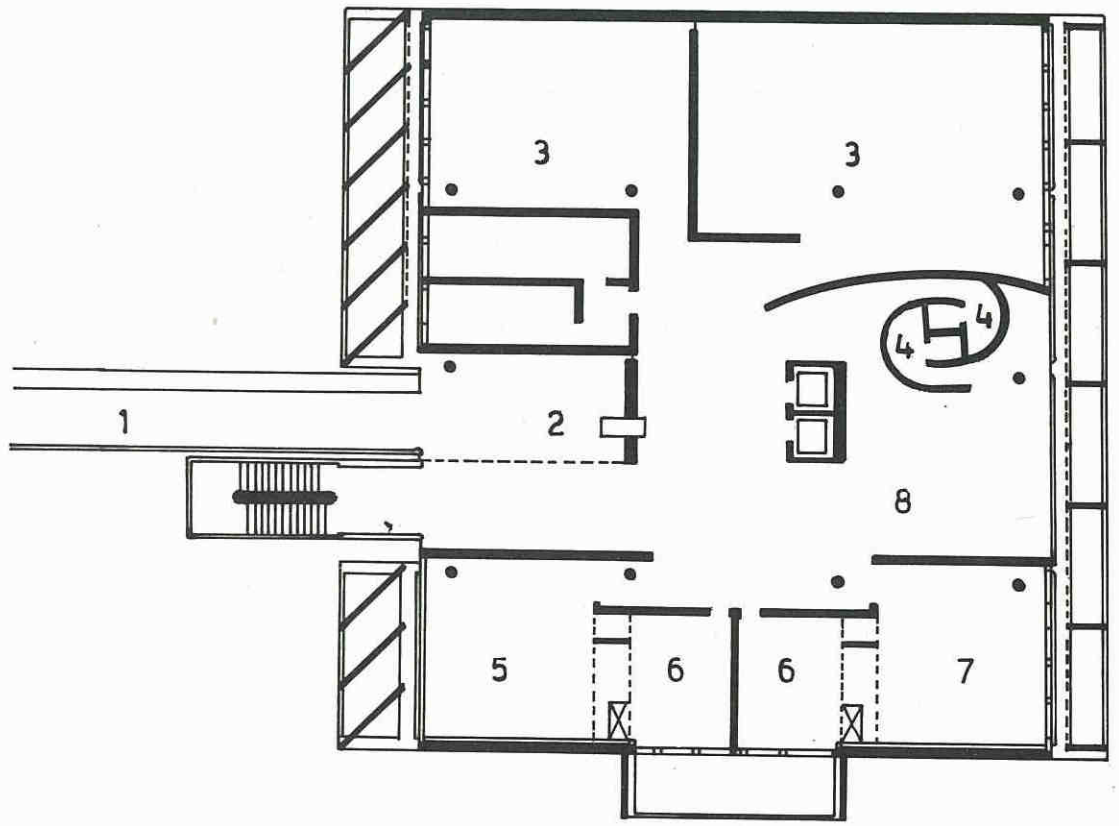
## HEADQUARTERS OF THE MILL OWNERS ASSOCIATION, AHMEDABAD (1954-56)

*Architect:* Le Corbusier, Paris.

This strongly disciplined, cube-like structure is situated on a picturesque site, overlooking the River Sabarmati. The design is based on the architect's concept of Villa Cook (1926), a house palace which he described as a place "endowed with dignity."[13] The structure is a symbol of the architect's response to the Indian climate and contains all of his formal inventions in this regard, e.g., pilotis, free plan, free facade, *brise-soleil* and a roof-garden.

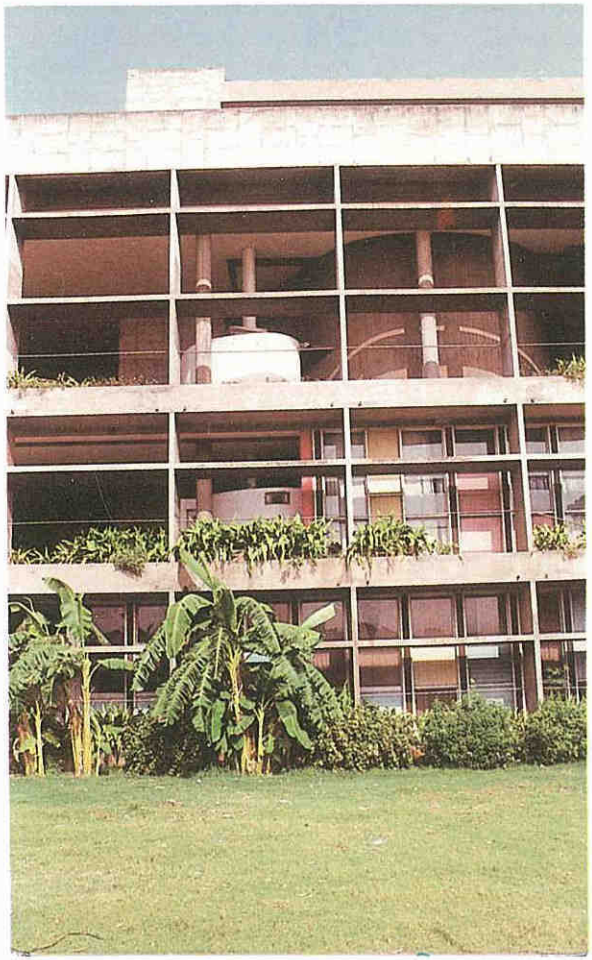
The building has accommodation for business, social and cultural activities of the Mill Owners Association and is expressive of its dual character—private and public. The ground floor is partly open and contains the services and circulation areas. A straight-flight linear ramp leads from the parking area directly to the waiting area on the first floor, which is earmarked for more private functions and houses a reception, offices and conference hall. The second floor, intended for public functions, is treated as a double floor and contains a lobby and an auditorium. The lobby, with its open space defined by harsh angular forms, and the top-lit auditorium, with curved surfaces penetrating the roof, add to the visual variety of the interiors. The roof, with its terrace-garden extending over the entire area, has been envisaged for use for evening entertainment, besides protecting the interiors from the heat of the sun. All these levels are vertically linked by two elevators and an external staircase.

The building is oriented to catch the prevailing breezes through openings on its east and west facades with reinforced-concrete *brise-soleil* and adjustable blinds. The north and south facades are predominantly blank with exposed brick surfaces.




1 RAMP
2 RECEPTION
3 CONFERENCE ROOMS
4 TOILETS
5 VICE PRESIDENT
6 SECRETARY
7 PRESIDENT
8 WAITING

PLAN



Corbusier-ism in concrete

Endowment of dignity

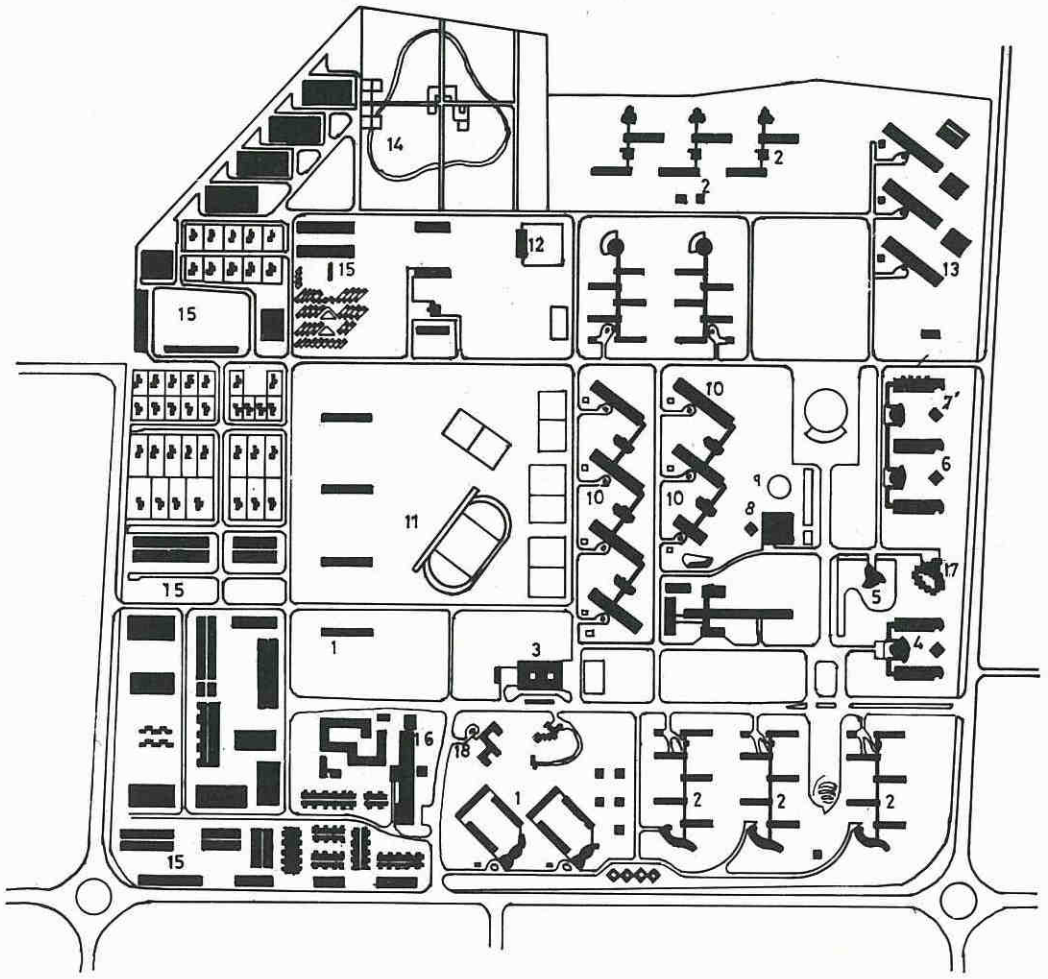
## PANJAB UNIVERSITY, CHANDIGARH (1955-65)

*Architects:* Pierre Jeanneret & B.P. Mathur, Chandigarh.

The Panjab University campus is located on a 145-hectare site in Sector 14 on the north-west end of Chandigarh. The first layout plan was prepared by J.K. Chowdhury, a consulting architect. In 1958, a revised master plan was prepared according to the changed requirements. Designed as a self-contained district, the campus has been divided into three zones—an academic area in the north-east, a sports area in the middle and staff housing in the south-west. The science blocks have been grouped together and are separated from the arts blocks by a ceremonial avenue which runs from an open-air theatre to a proposed convocation hall.

The Science Faculty consists of three-storeyed blocks which look alike but have different designs. These blocks are oriented north and south with deep-set glazing. In between these blocks are two classrooms and a large hall. The buildings have a reinforced-concrete-frame structure with in-fill walls of brick and red sandstone cladding on the outer surfaces. Each block has a central corridor, laboratories to the north and ancillary rooms to the south. Vertical ducts are provided on either side of the corridor to house services.

The Arts Faculty departments are housed in blocks which are laid out uniformly with a repetitive design. Each block is planned over a central corridor with lecture theatres arranged diagonally to face the north. On the other side of the corridor are the teachers' rooms facing the south-east, protected from the sun by *brise-soleil*. Vertical concrete louvers act as structural columns and support the beams and slabs. A museum which forms part of the Arts Faculty consists of 16 square units. These units are arranged around an irregular court which also acts as an outdoor space for sculptures. The building is designed in a way to achieve easy approach to and return from the exhibits




LAYOUT

without having to walk through the entire exhibition area.

The five-storeyed library is situated approximately in the centre of the area covered by the teaching departments. Two spacious reading halls have been provided—one for the sciences and the other for the humanities. The north-east facade has concrete louvers which provide shade to the glazing. A series of projecting concrete balconies give plasticity to the south-west facade. The structure is in reinforced-concrete frame with the panel walls clad in red sandstone. A pool of water not only cools the flitting breezes but also lends the place a certain serenity.

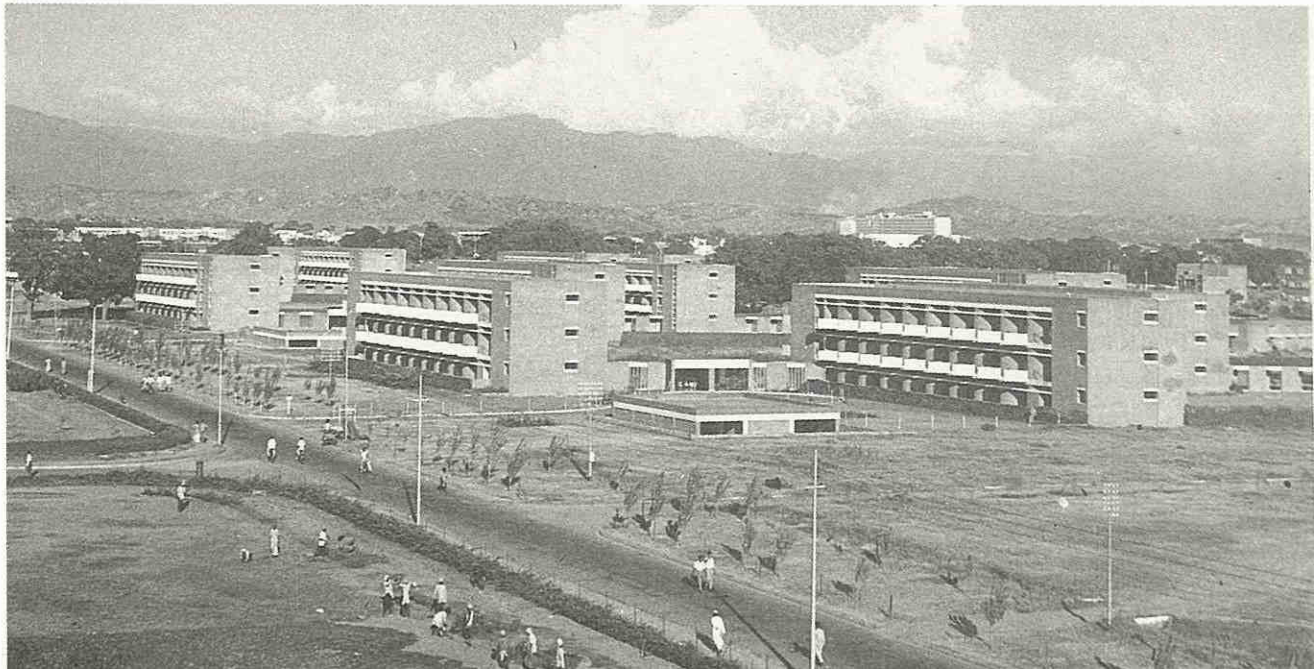
The Student Centre is located near the library and serves as a rendezvous for the youth. It is a four-storeyed cylindrical structure. Full glazing has been provided on the cafeteria sides to catch glimpses of the surrounding landscape. The building is constructed in exposed reinforced concrete.

Gandhi Bhavan was established on the campus to promote Gandhian philosophy. Its aims are to make the relevant literature available and to hold study classes and discussions on Mahatma Gandhi's life and works. These three basic functions materialise into a three-winged structure jutting out in three directions. The building has been placed in a pool of limpid water to infuse calm and quiet and to breathe peace all around. A pedestrian approach has been provided to the entrance. Gandhian ideals are symbolised by the pointed and rounded forms of the building. The pointed forms suggest the sharp edge of truth and the rounded forms indicate harmony. The interiors of the building are illuminated by skylights, while the external walls are left unpunctured. The building is finished in white marble aggregates.

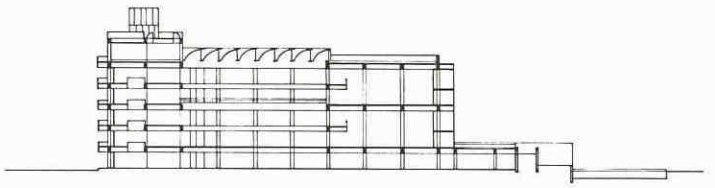
The Administrative Block, which occupies a dominant position on the campus, consists of a basement and five floors. Each floor projects to the outside from the floor below, thus projection and shade are provided to the glazing without constructing any verandahs or

Library: Imparting transparent knowledge

A bird's eye view of the University cam



## LIBRARY



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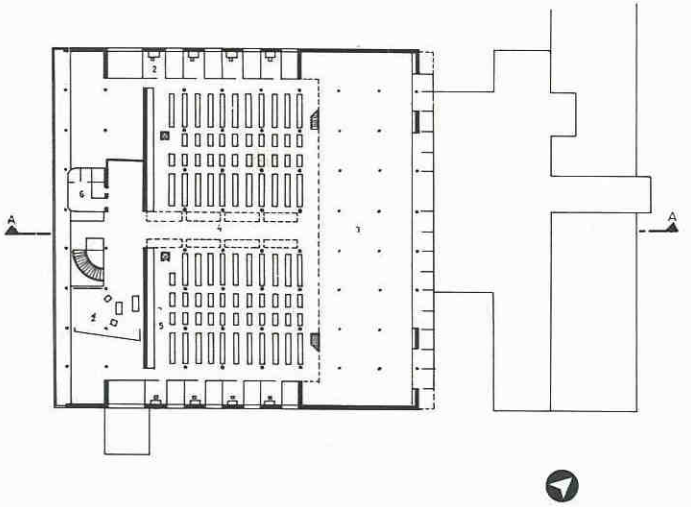
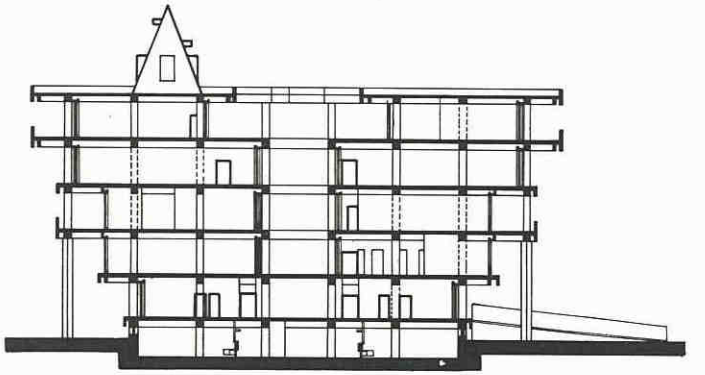



FIRST FLOOR PLAN

## ADMINISTRATIVE BLOCK



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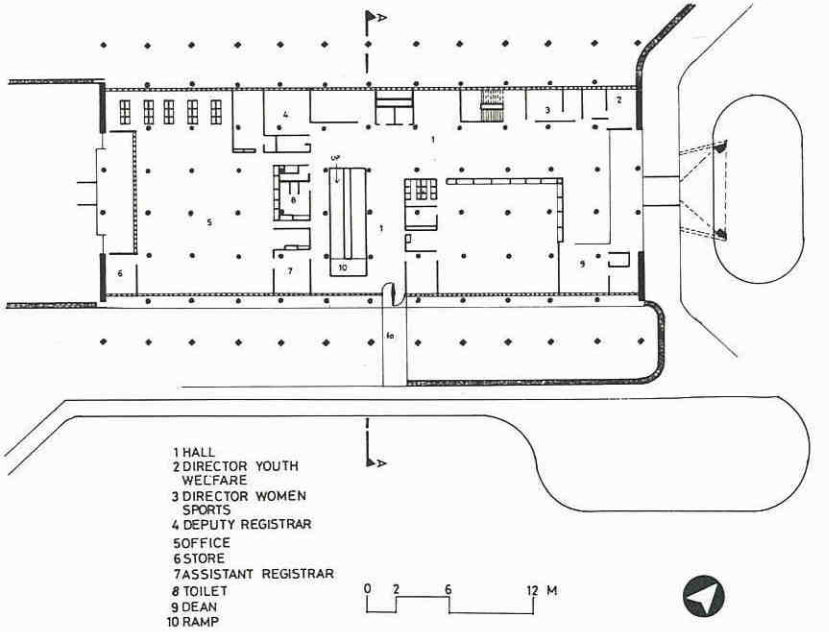
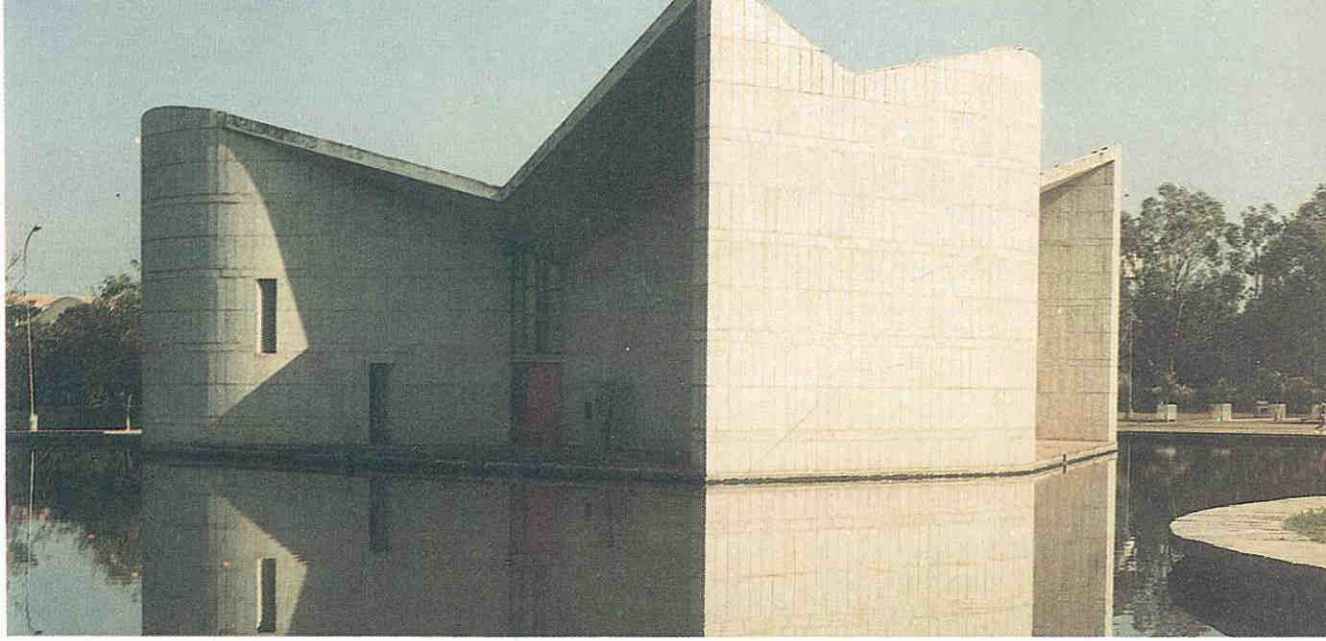



GROUND FLOOR PLAN

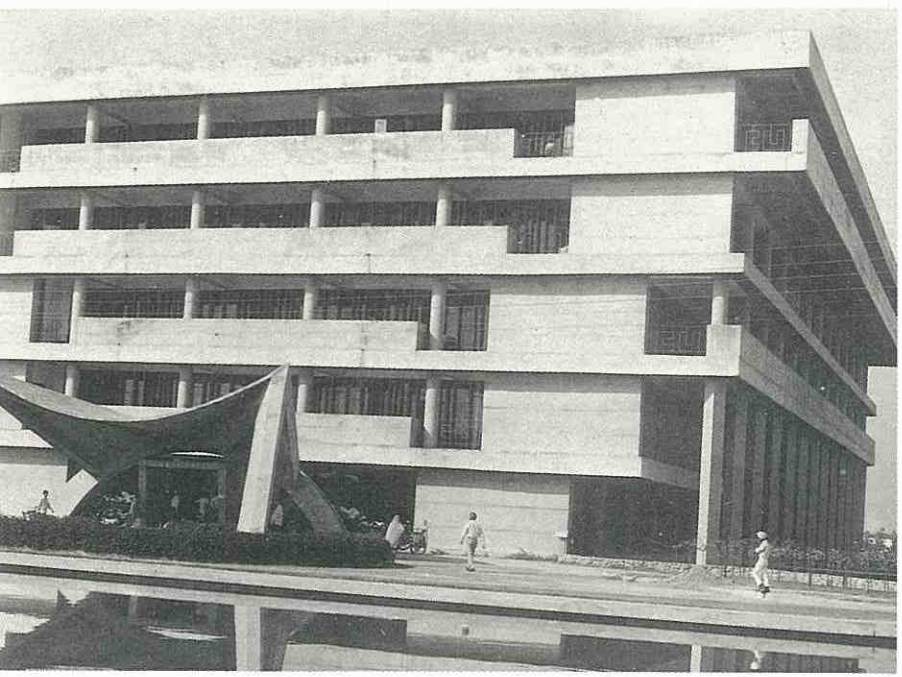
louvers. For vertical circulation a ramp, staircases and lifts are provided. The front facade, facing a water body, is distinguished by a gracefully arched concrete canopy which makes the entry apparent and inviting.

The boys' hostels, located on the south-east and the north-west, are grouped in units of five. The rooms, which are planned on either side of a central corridor, open out to a triangular balcony which is sufficiently commodious for outdoor sleeping. Each balcony provides a view of the Shivalik Hills. A low-height corridor connects the blocks of each unit with a dining hall.



Jeanneret's interpretation of Gandhian truth

Administration of education



The Student Centre

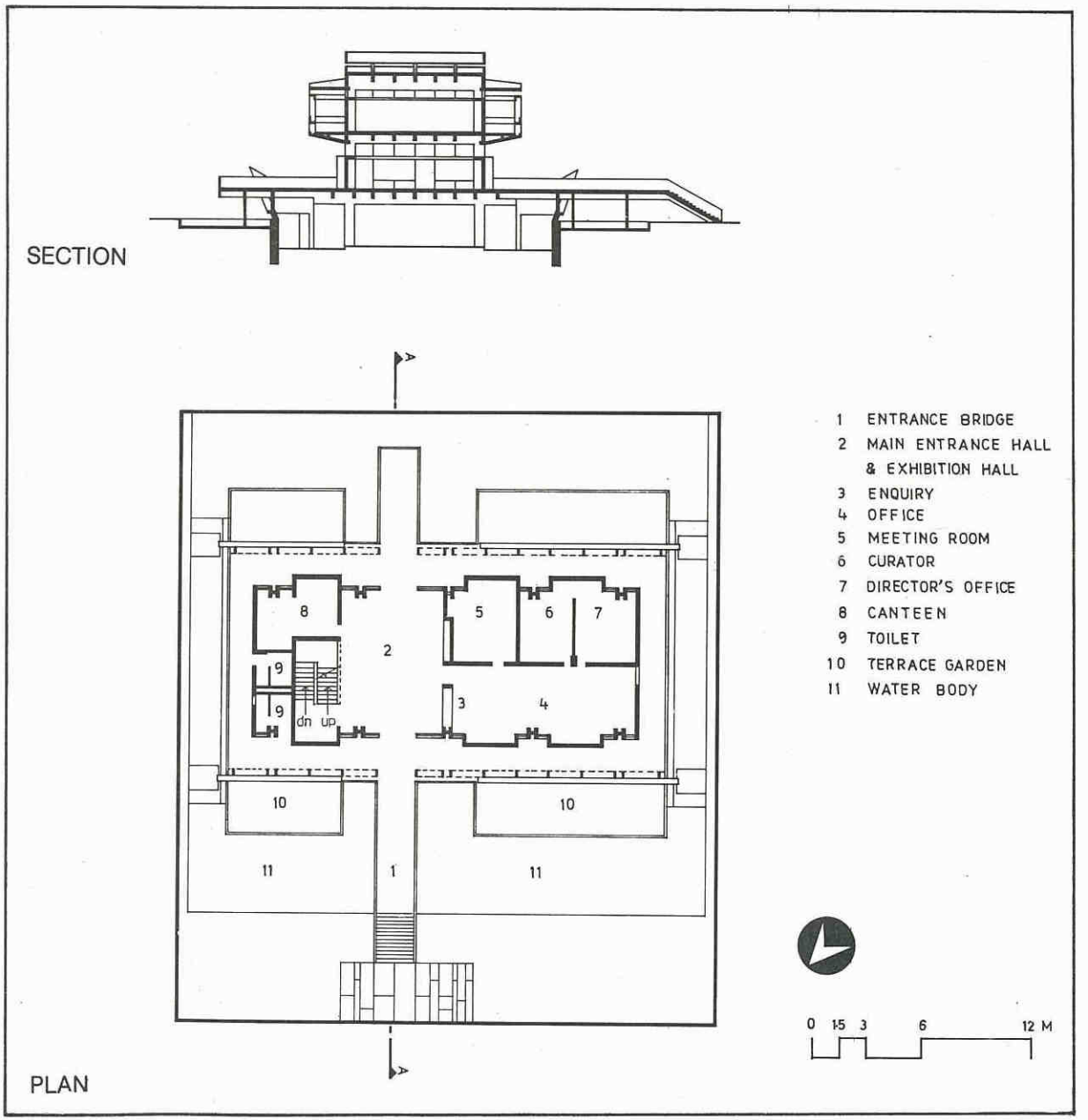
# L.D. INSTITUTE OF INDOLOGY, AHMEDABAD (1957-62)

*Architect:* Balkrishna Doshi, Vastu-Shilpa, Ahmedabad.

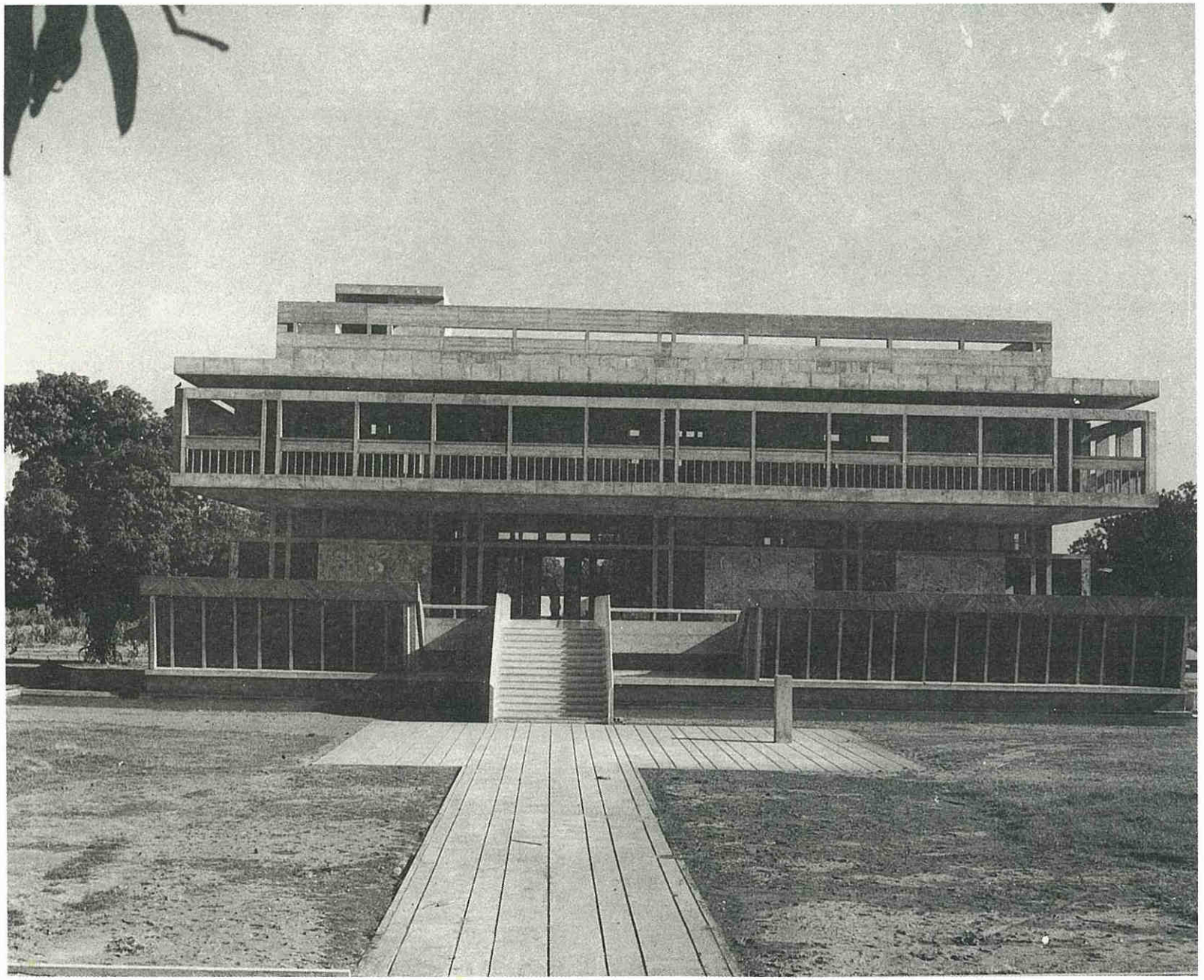
Located on a 3.7-hectare plot close to the Gujarat University campus in Ahmedabad, the L.D. Institute of Indology has 2,858 square metres of built-up area. The institute was established to collect and house ancient manuscripts relating to the Jain religion and to offer facilities for research.

To protect the rare miniature paintings and manuscripts from varying temperatures, it would have been unwise to use mechanical ventilation. That would have spelt a requiem for the delicate documents. So, to counteract intense heat and glare, the library has been built half underground, indirectly lit by angled windows. A water body not only reflects light to the interiors but also helps in cooling the breeze that skims over it. The raised ground-floor level, which is approached by a bridge over the pond, accommodates the entrance hall and administrative offices. The top floor, which houses the teaching rooms, is cantilevered over the walkways beneath and has a deep verandah on all the sides, helping in cutting down the hostile sun.

The building is of exposed reinforced concrete with Kota-stone floors. Marble inlays and dark-stained wood have been used for the railings and the doors.



The impressive Concrete



*LD Institute of Indology, Ahmedabad* **37**

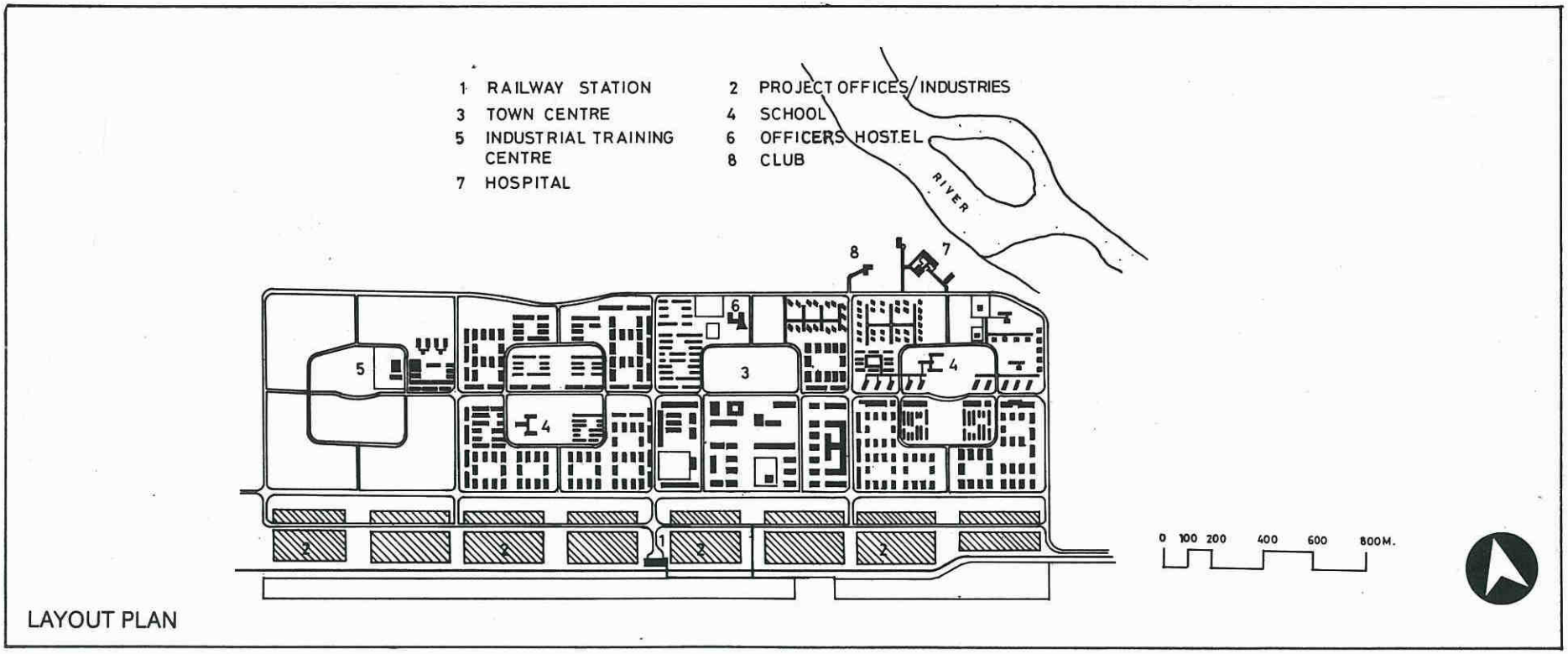
## TALWARA TOWNSHIP, PUNJAB (1959-65)

*Architect:* Pierre Jeanneret, and J.S. Dethe, Chandigarh.

Located on the Mukerian-Dehra Gopipur road in Hoshiarpur district of Punjab, Talwara township was planned for a population of 50,000 which was engaged in the construction of the Beas Dam. The rectangular-shaped linear site, measuring 1,200 by 3,220 metres, has a gentle slope towards the north. The picturesque site gets a view of the snow-capped peaks of the Dhauladhar Mountains throughout the year. It is bounded by River Beas on the north, the Shivalik foothills on the south and a dry stream on the west. The old village of Talwara is located in the east.

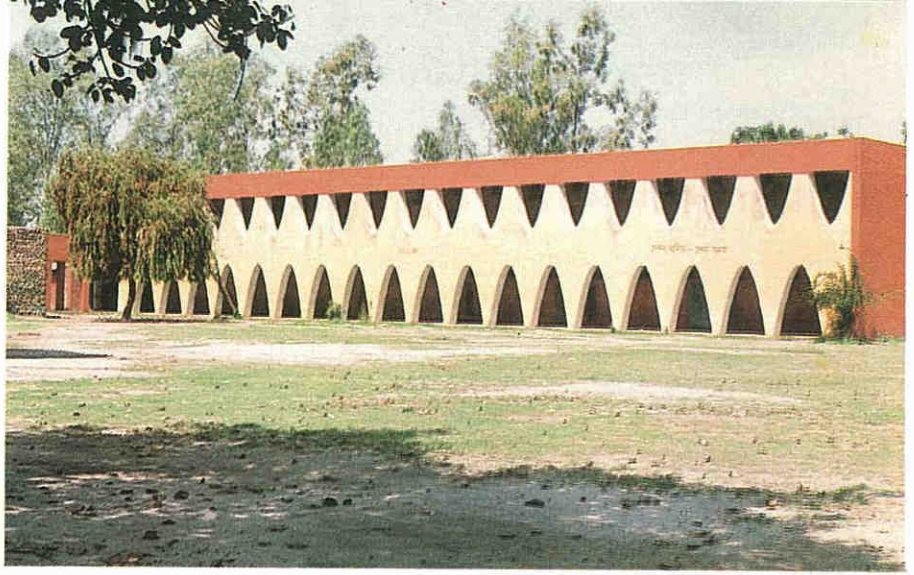
The already existing road passing through the site was taken as the guiding artery for evolving the layout of the township. An industrial area comprising workshops, stores and project offices was planned along this road. A wide green belt was created to separate the residential area from the industrial complex. A railway station was proposed on the southern side in the middle of the industrial belt. A hospital and a club have been built on the north-western side on the river bank. Different types of houses were planned to suit the residents of various income groups.

The residential area is divided into four sectors. Each sector is self-sufficient, having shops, schools and a post office. Each is bounded by fast-traffic roads running on its four sides and permitting only four vehicular entries into its interior. Each sector is planned to accommodate 12,000 persons. A shopping street running east to west divides the sector into two parts. Intersecting the shopping street is an interior loop road serving as the principal distributor of traffic within the sector and from this loop road the streets sprout, providing access to every house. Footpaths traverse the




LAYOUT PLAN

Village turns into a Town



School in a serene setting

Natural materials in a Peaceful coexistence

internal green belts and shopping streets. Each sector has a central green space which contains educational and recreational facilities. Most of the buildings are designed in a terrace formation. Sector 2 comprises the town centre to accommodate offices, commercial establishments, a bus terminus, a fire station, a post office and banks.

The buildings have exposed brickwork on the exterior surfaces. This finish fits in with the ruggedness of the site.

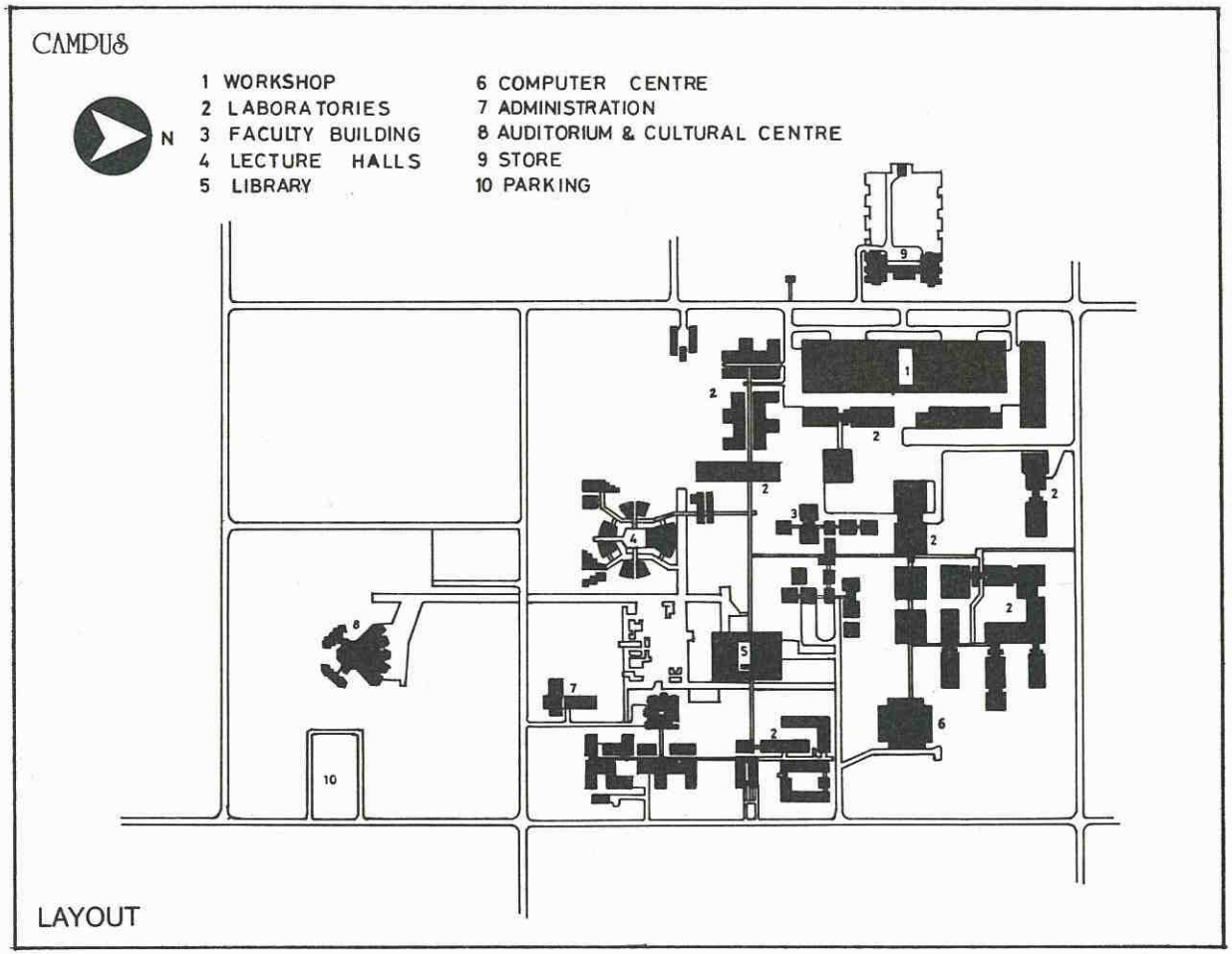
## INDIAN INSTITUTE OF TECHNOLOGY, KANPUR (1959-66)

*Architect:* Achyut Kanvinde, New Delhi.

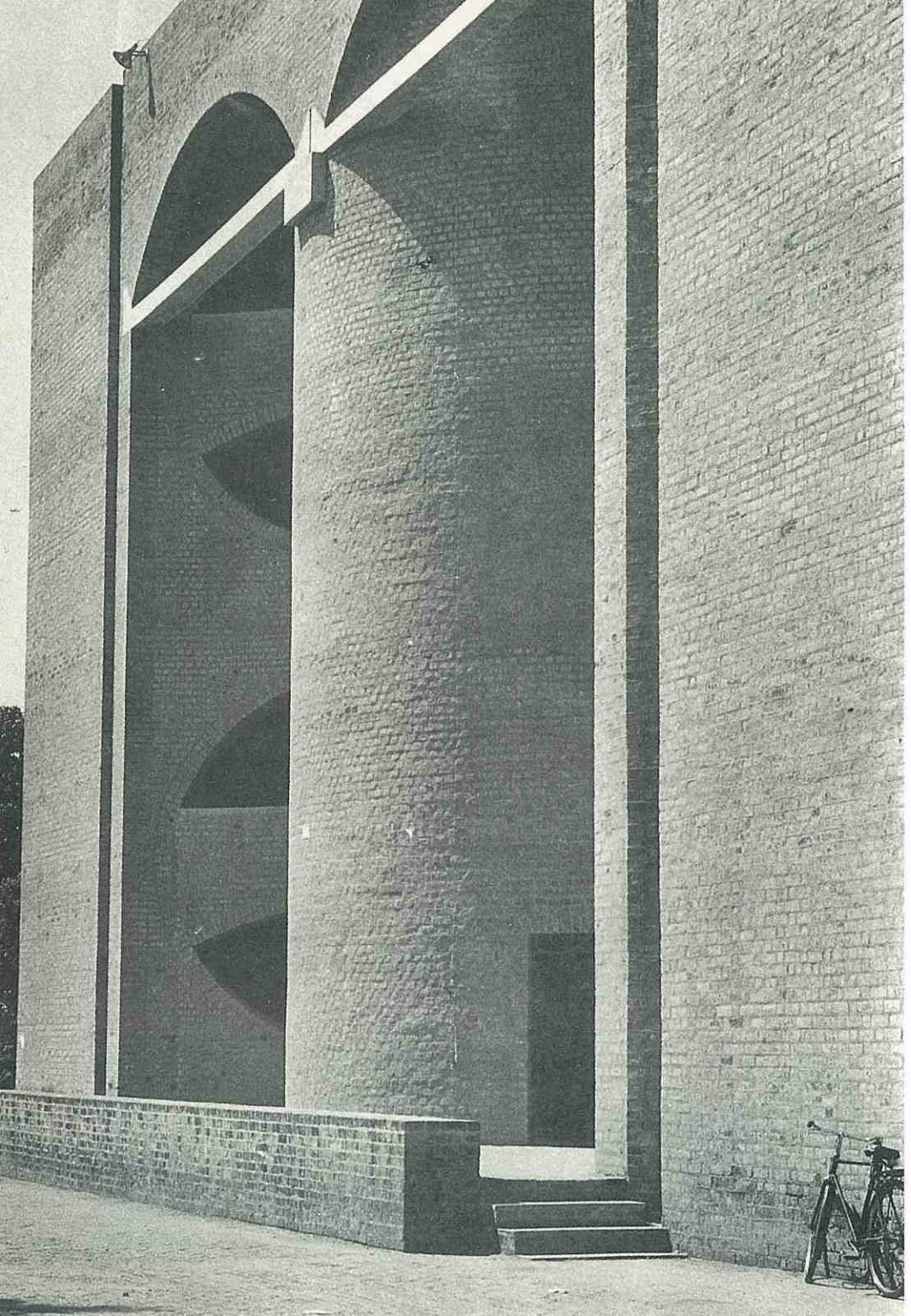
The Indian Institute of Technology at Kanpur is one of such premier institutions established by the Union Government to impart high quality technological training in India. Located on the outskirts of the city of Kanpur in Uttar Pradesh, it is the first example of a comprehensive modern campus built in the country.

The most significant aspect of the campus is its planning by function rather than by discipline, discarding the conventional idea of separating activities by departmental divisions. This helped in achieving economy, not only in the initial cost of construction due to easy and repetitive construction based on modules suited to the particular function but also in the recurring cost of running and maintenance of the mechanical systems. Besides, the system adopted provides for efficient utilisation of facilities in the academic wing and helped in achieving clarity in the aesthetic expression of the individual buildings.

The main academic complex is organised in a quadrangle on an area of 20 hectares. It is planned in such a way that the main vehicular traffic is confined to a peripheral road, allowing human and material access to the various building activities on the campus but keeping the inner core mainly a pedestrian island. The quadrangle comprises a library, a lecture theatre block, a faculty building, a computer centre besides the laboratories, workshops and areas for cultural and recreational facilities. All these building components are interlinked by detached two-level corridors which not only facilitate cross-ventilation but also allow for future growth. An underground service tunnel runs along these corridors. The elevated ambulatories, together with the library-podium, stilted areas of lecture theatres, the plaza and a variety of other open spaces, encourage inter-disciplinary activity and give scope to intellectual and cultural stimulation—an important objective of the programme of this institute.




Based on the modular concept, the buildings are harmonious in character, have open forms with linking corridors and spaces penetrating through, thus providing shelter from the extremely hot sun, yet allowing welcome breezes. The structural system consists of reinforced-concrete frames and slabs with locally available brick curtain-walls. The external surfaces, whether of concrete or brick, are left exposed to obviate recurring maintenance costs and to enhance the aesthetic appeal.



The Indian Institute of Management, Ahmedabad

# Section II (1961 to 1970)

| |
|---|
| Indian Institute of Management, Ahmedabad |
| Administrative Building, Hindustan Machine Tools Limited, Hyderabad |
| Thirty-Eighth International Eucharistic Congress, Bombay |
| Cultural Centre, Chandigarh |
| GSFC Township, Vadodara |
| Shri Ram Centre, New Delhi |
| Space Applications Centre, Ahmedabad |
| Jodhpur University Extension, Jodhpur |
| Central Library, Srinagar |
| Guru Nanak Dev University, Amritsar |
| Indian Statistical Institute, New Delhi |
| Gandhinagar |

## INDIAN INSTITUTE OF MANAGEMENT, AHMEDABAD (1962-74)

*Architect:* Louis I. Kahn, Philadelphia

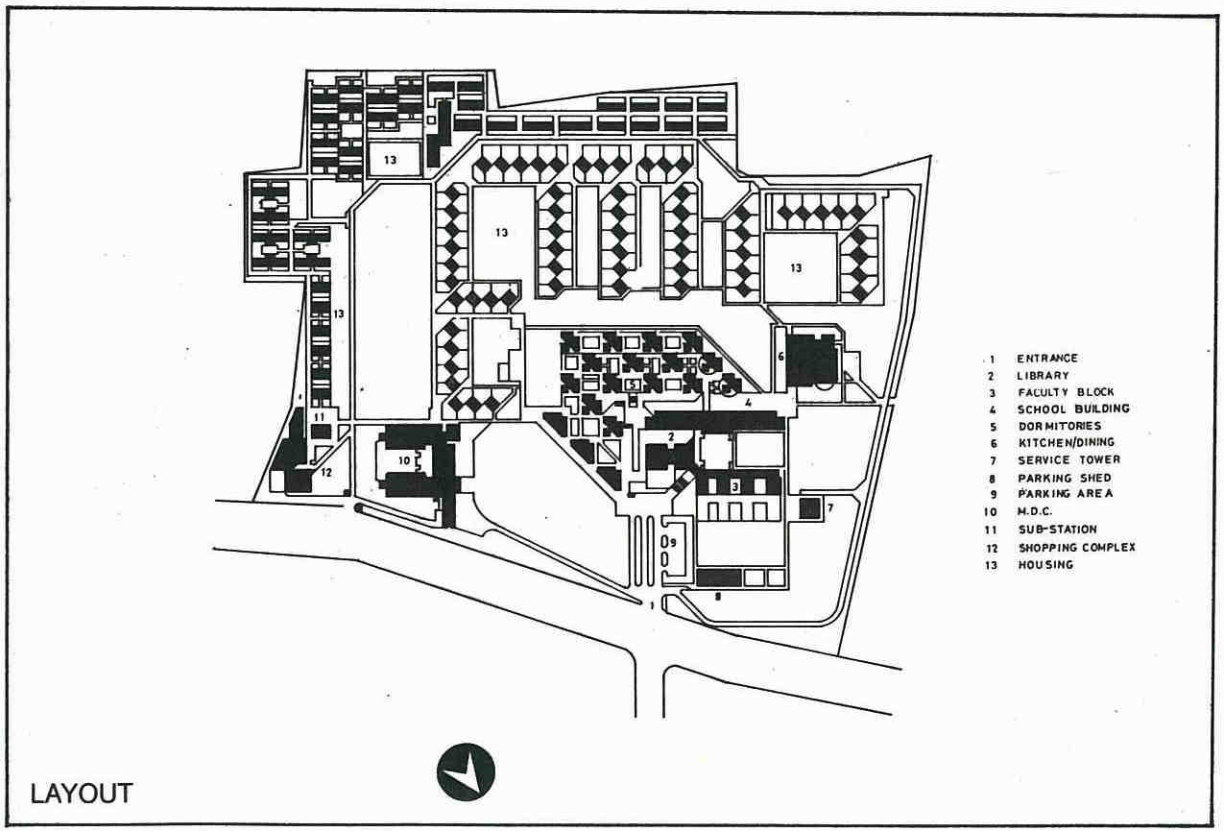
The Indian Institute of Management is situated on a 27-hectare site on the western side of the city of Ahmedabad, in close proximity to Gujarat University. The campus is so planned as to promote interaction between students and teachers. Its master plan comprises an institutional complex and a housing sector for the faculty and staff. Separate accesses are provided to the institutional complex and the housing sector. To distinguish and separate these two zones, a large L-shaped lake (not realised as yet) has been planned. All service buildings like the cooling tower, water reservoir and the kitchen-dining block are located on the north-western side of the campus. On the eastern corner of the site lies a proposed market-place.

The institutional complex consists of a school on the southern side, faculty offices to the north and the library to the east. At the heart of this complex is a large open space known as the Louis Kahn Plaza. It is the hub of all campus activities and relates to movement around the classrooms, library and the faculty and administrative offices.

The library, the most prominent building in the campus, is approached by a broad flight of steps rising from the parking court. It is so designed as to become the centre of faculty-student interaction. A stair-well in the centre of the rectangular plan of the library helps define the reading and stack areas. The design has been conceived to entail movement from the active spaces to the most private and quiet study carols at the farthest reaches. The school building is connected to the library by an ambulatory and to the dormitory blocks by an overbridge. The ground floor has most of the administrative offices with classrooms and seminar rooms on the first and second floors, respectively. Lobbies are created in between the classrooms and these not only provide entry to rooms but also serve as spots where students can meet and exchange ideas before dispersing after their classes. The seats in the classrooms are arranged in a horseshoe pattern. Illumination is provided by light-wells especially designed for glare-free interiors. Four-storeyed faculty office blocks are joined together by a corridor. Each block has five offices on either side of the corridor on each floor.

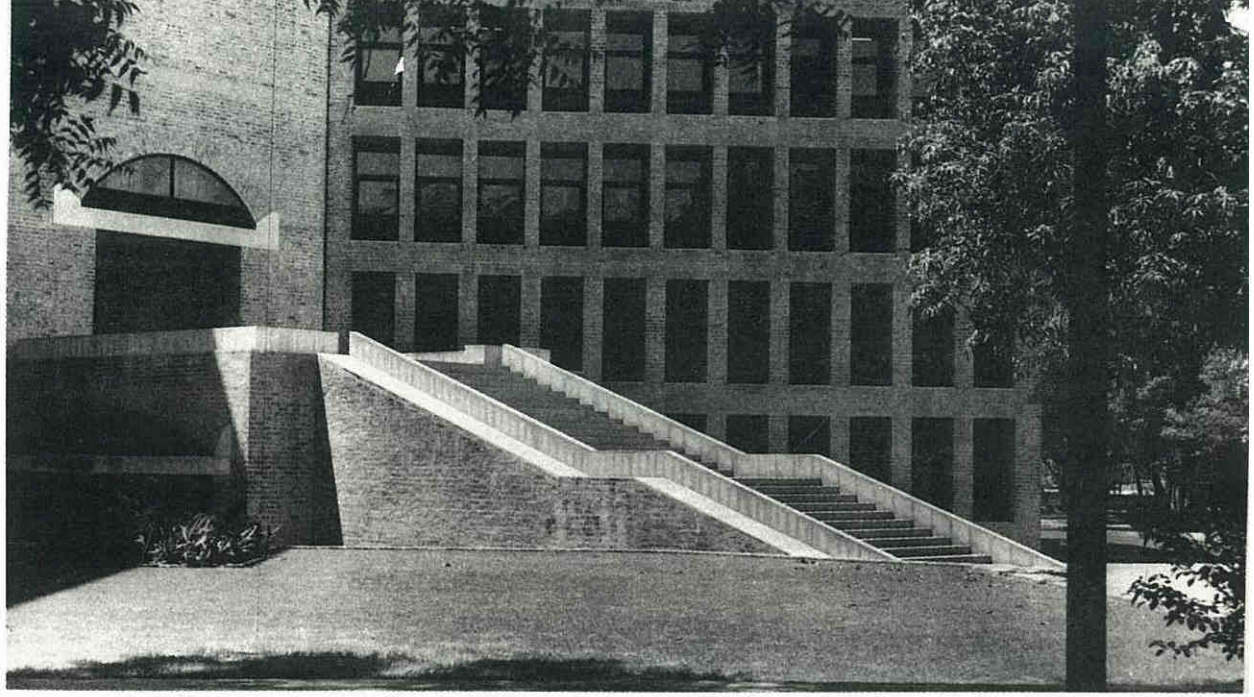
The dormitory blocks are planned around the educational buildings. There are 18 dormitory blocks which can accommodate 400 students. A series of courtyards have been created to give free access to the needed breeze. The design of the individual blocks as well as their layout are intended to promote interaction among the students and to provide them privacy. The shape of each dormitory block is square with two residential wings, a triangular lounge and a service area.

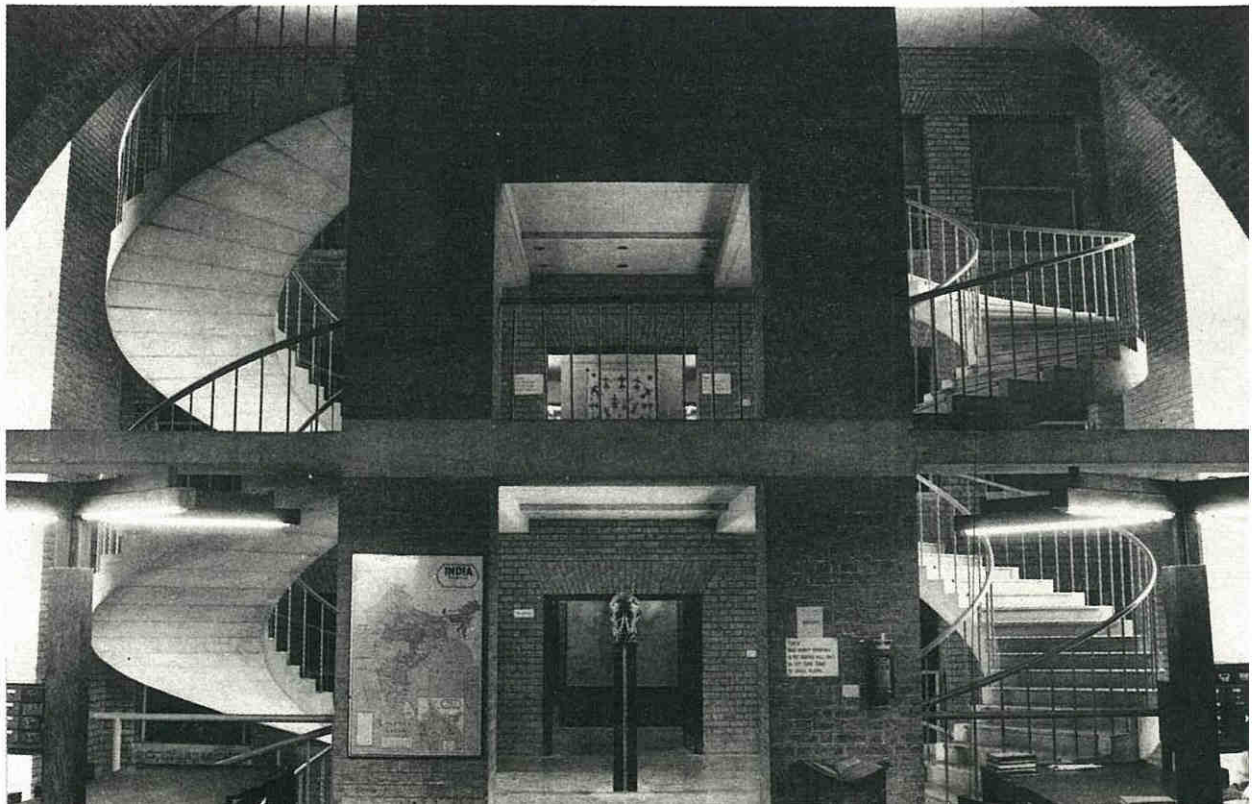
In the housing sector, the layout of the structures forms large inner courts to give a feeling of peace and serenity, qualities vital in housing. The houses have low heights and their




LAYOUT

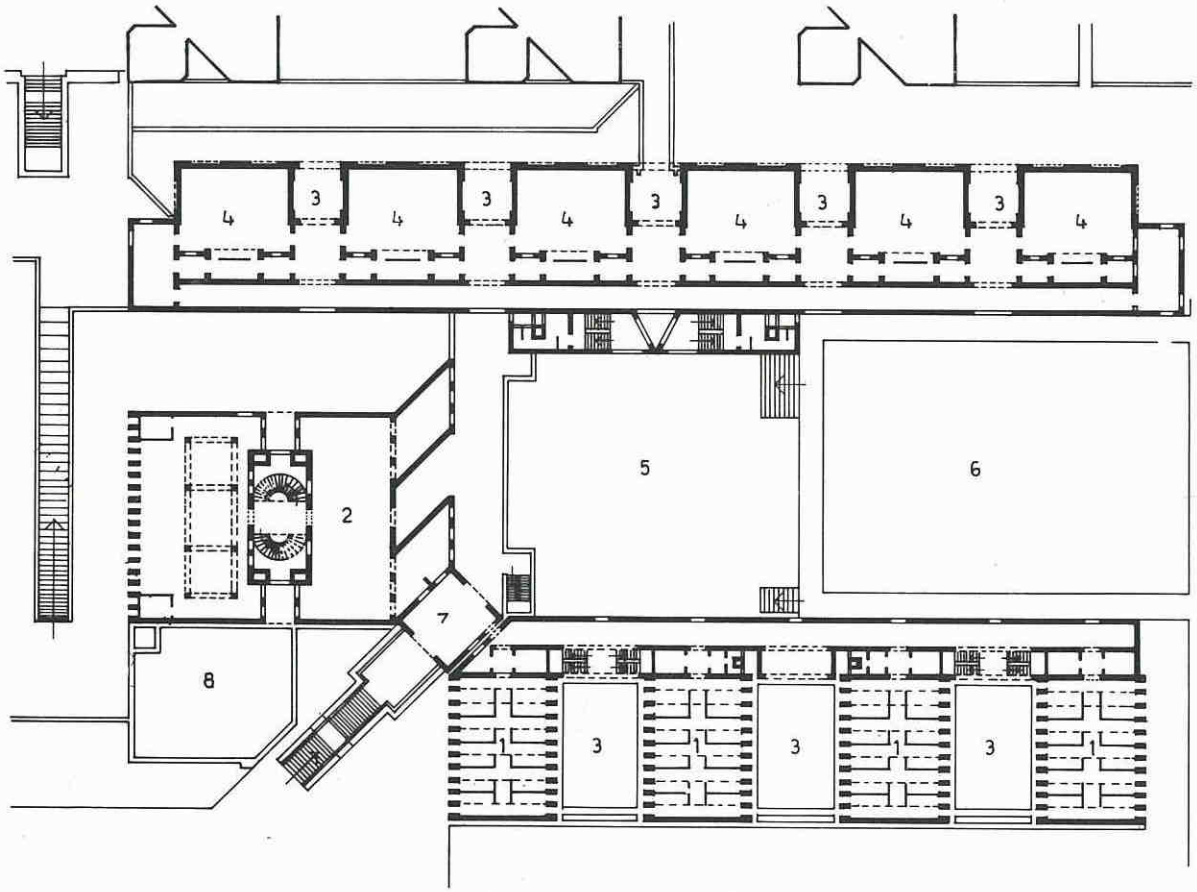
Magnificent entry for the future managers





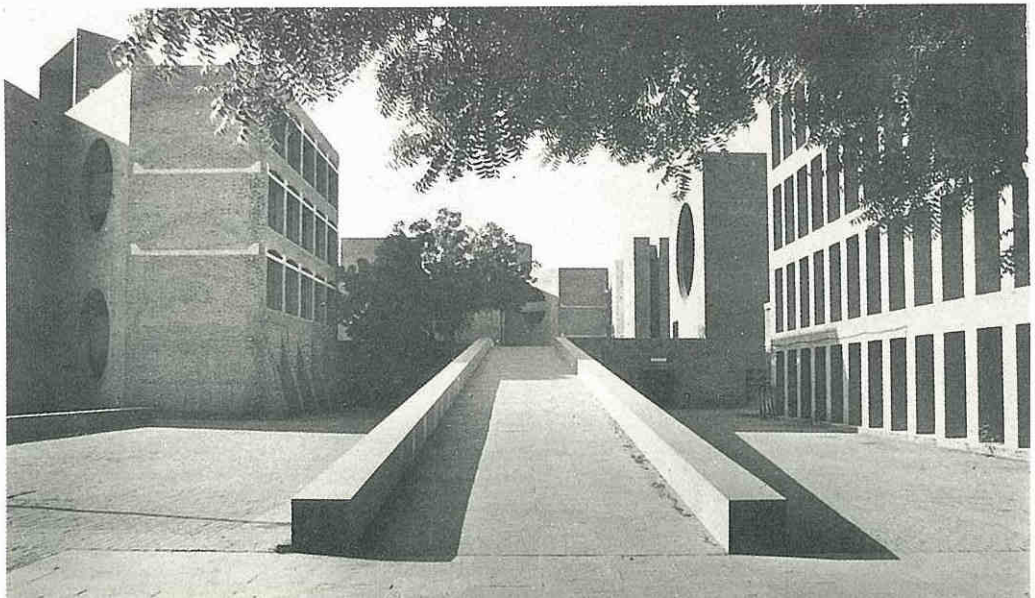

Library interior: Meticulous Kahn-ian details

1 OFFICE
2 LIBRARY
3 COURT
4 CLASS ROOM
5 LOUIS KAHN PLAZA
6 GROUND COURT
7 ENTRANCE PLAZA
8 RAISED LAWN




FIRST FLOOR (PART) PLAN

Small clusters provide a feel of homeliness



plans are simple. The faculty houses are oriented diagonally to catch the prevailing breeze. Design elements like the deep-recess windows and segmental and flat arches accentuate their forms and help in maintaining visual uniformity. All the buildings are constructed in red brick with external surfaces left exposed. Concrete is restricted to places such as the foundations, floor slabs and ties for some of the arch openings. The composite order permitted large spaces and wider openings. The thickness of the walls is reduced by using filled-in arches to transfer loads down the sides to the brick buttresses below.

Prevalence of geometric forms

## ADMINISTRATIVE BUILDING, H M T LIMITED, HYDERABAD (1963-67)

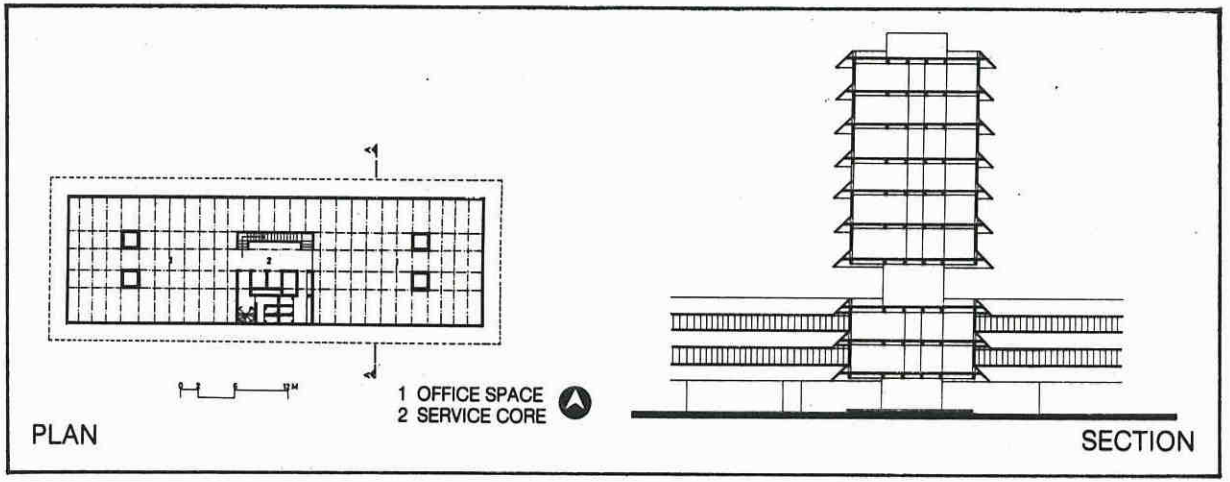
*Architect:* Chandavarkar & Thacker, Bangalore.

The administrative building forms part of the main HMT factory complex which is located about 12 km north of Hyderabad. To make it a symbol of the company's growth, it has been conceived as a high-rise structure with a clearly visible, simple yet memorable form.

The building, with an area of 13,600 square metres, consists of administrative, technical and design offices. The technical offices form a three-storeyed structure that overlooks the main factory, and the administrative and design offices form a nine-storeyed structure.

One of the requirements was a flexible column-free space which would provide the HMT management with a great deal of freedom in planning the interior offices and making renovations whenever necessary. This resulted in a structural system of three main cores. The central core houses the lifts, staircases and toilets, and the two other cores are hollow shafts which are used for the vertical routing of the building services. The main beams are supported by these cores in an east-west direction and there are cantilevers in both directions. In the north-south direction inverted T-beams form the cantilevers from the main beams and the floor is completed with precast reinforced concrete slabs. These slabs can be removed at any time to introduce services such as water pipes and electrical conduits.

The continuous steel-framed windows are protected by deep-sloping concrete overhangs. The triangular space formed between a slab and a sloping overhang has been used for providing electrical cables and telephone lines. The interior spaces were left empty for the administration to decide the office layout and partitions were installed only when the layout was finalised. There was thus complete flexibility in the internal spaces.




Elegance of structure

*Administrative Building, H. M. T. Limited, Hyderabad* **49**

# THIRTY-EIGHTH INTERNATIONAL EUCHARISTIC CONGRESS, BOMBAY (1964)

*Architect:* Suraj P. Subherwal, New Delhi.

The 38th International Eucharistic Congress was held in 1964 in Bombay at the Oval Ground—a picturesque site with palm trees on the fringes and accessible from the Queen's Road on the west and the Mayo Road on the east. To plan and develop the site temporarily for this great occasion, an open architectural competition was held and Suraj P. Subherwal's design was adjudged the best.

The altar was located in the middle of the Oval Ground, thus bifurcating the grand nave. Planned for a gathering of over two lakh persons, the nave could be approached through 17 gates. A 10-metre-wide main processional path was planned in the middle along the north-south axis.

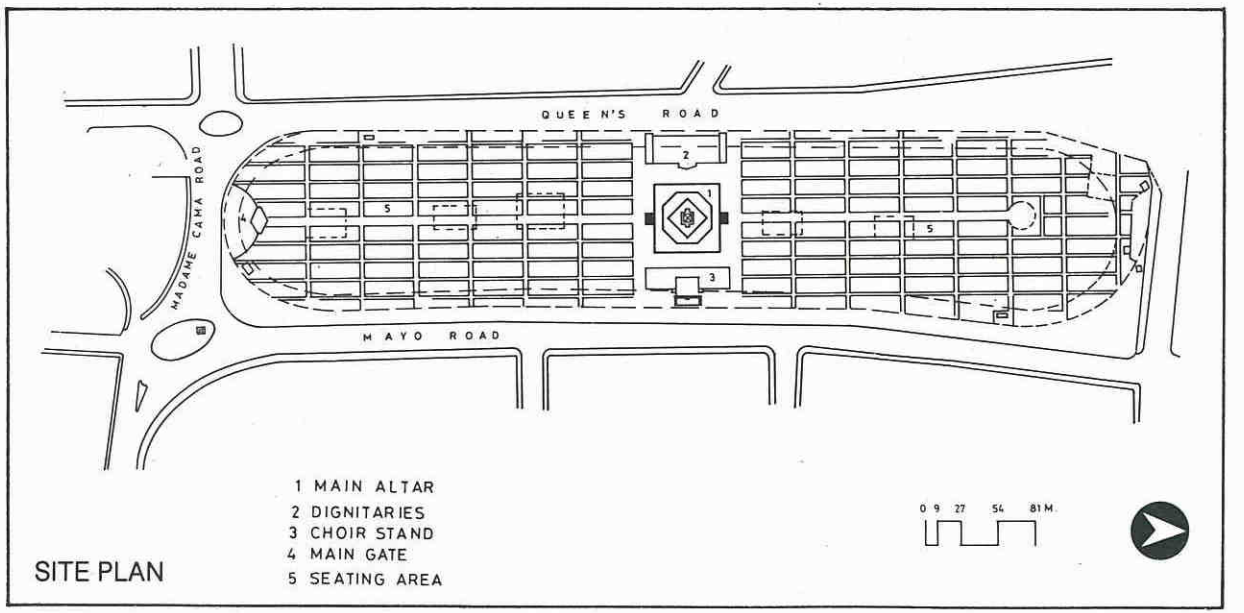
The Congress being primarily of a religious and spiritual character, propriety demanded that the entire structure at the Oval Ground, especially the Altar, should dominate the scene and the whole composition should be religious in appeal.

The triangle, a motif indicating the Trinity, was the basic element of design. Gables on all four sides, representing folded hands giving thanks, which in Greek means *Eucharist,* formed the natural termini. The eye travelled upwards along the rising lines of the canopy over the main altar table, raising the mind and heart in prayer to the source of all life and matter. The purity of converging lines was indicative of the upward urge for spiritual union with Christ, of whom the Congress was the mass expression.

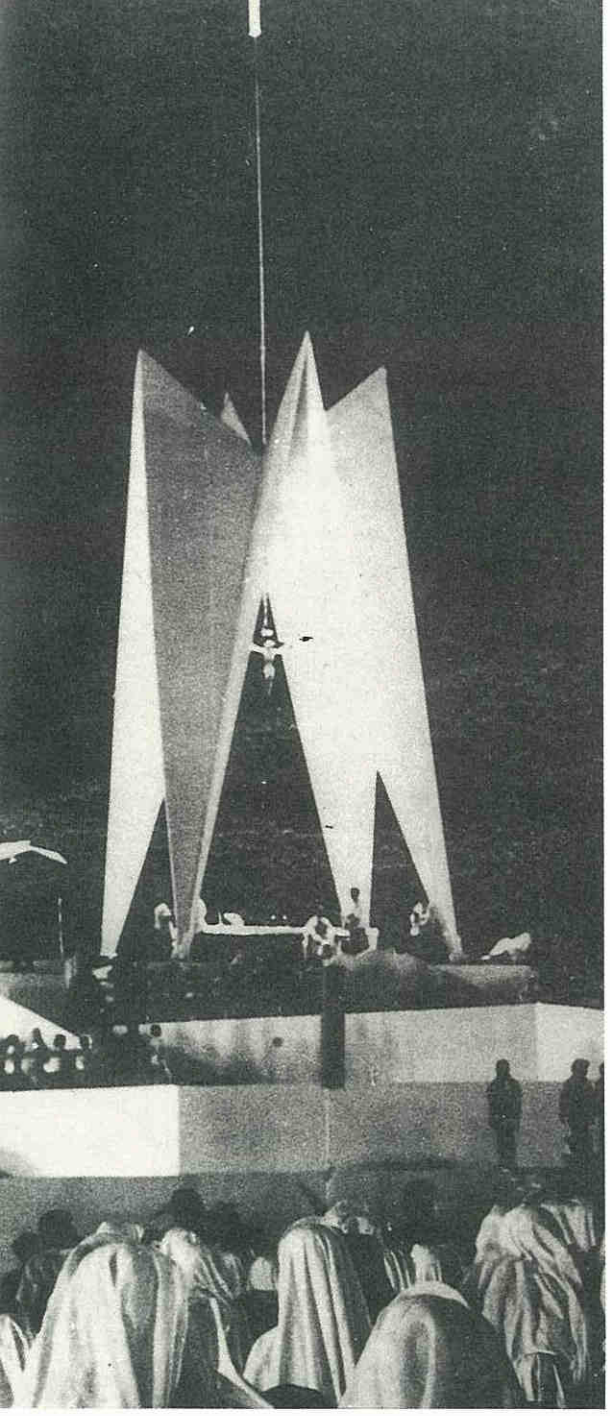
The architect translated the religious aspect of the occasion into a simple treatment of lofty triangles, all in white, aspiring above a massive square and octagonal platforms below. The lofty canopy, rising to a great height over the main altar table, met one of the ecclesiastical requirements and, while creating an atmosphere of worship, stressed the value of Spirit over matter, of God over the world, of the Eternal over the temporal. The altar was elevated from the ground in order that it could be seen by the congregation. It was reached by tiered platforms which added further richness, feeling and scale to the sensitive design. The triangle motif was continued in the steps leading from one platform to another.

High intensity lighting on the altar, the focal point of worship, medium intensity over the platforms and external surfaces of the canopy, and low intensity all around the platforms made a strong emotional impact and focused all attention on the altar.

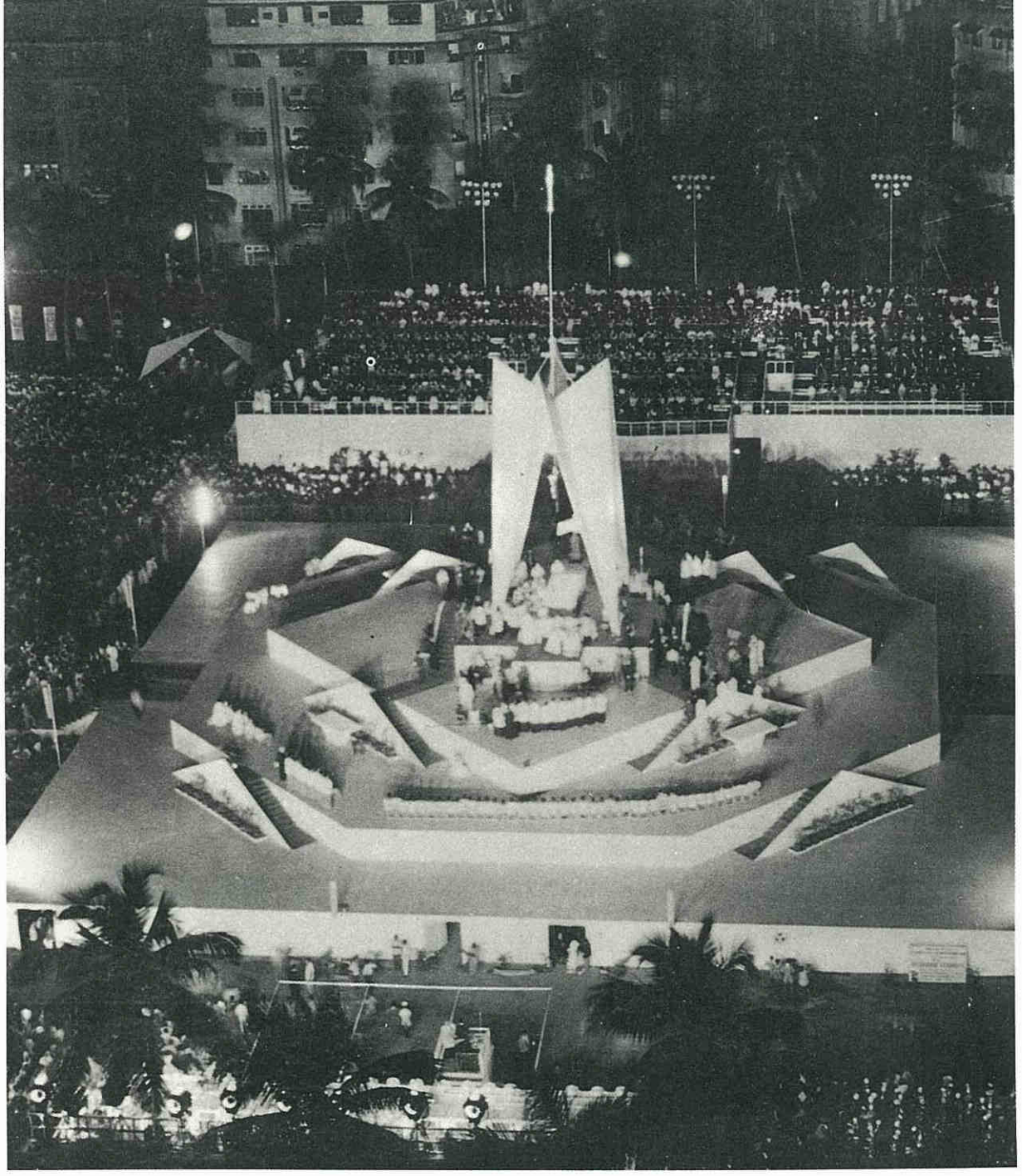
Wood was employed as the main structural material to minimise the dead load, thereby avoiding heavy foundations. All the structures were designed in such a manner that prefabrication of the components, their transportation from the workshops to the site and their assembly at the site was easy and efficient. The lofty canopy made of prefabricated stressed-skin plywood panels was hoisted in four pairs by means of cranes and supported on plywood box beams and hollow wooden columns.



SITE PLAN



Resurrection of Lord's Kingdom on Earth



Catholic congregation like an arena theatre

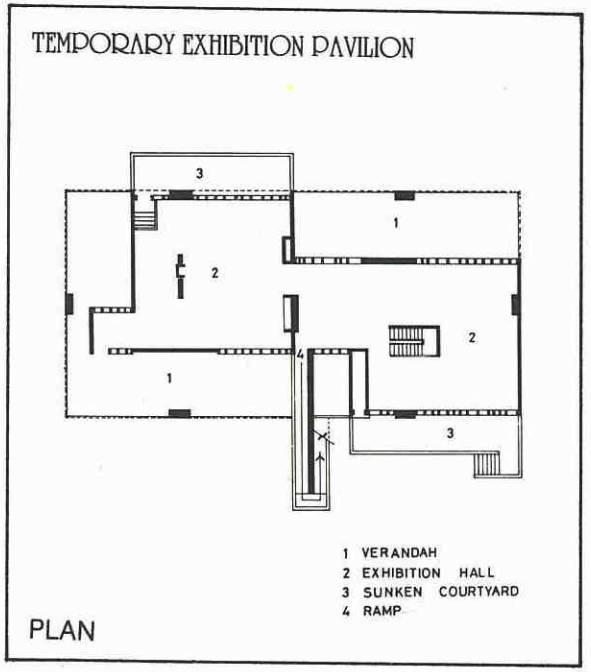
## CULTURAL CENTRE, CHANDIGARH (1964-86)

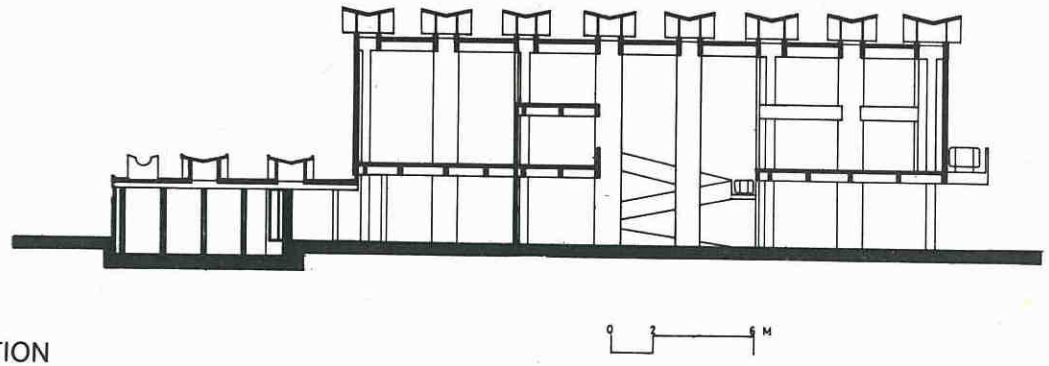
*Architect:* Le Corbusier, Paris.

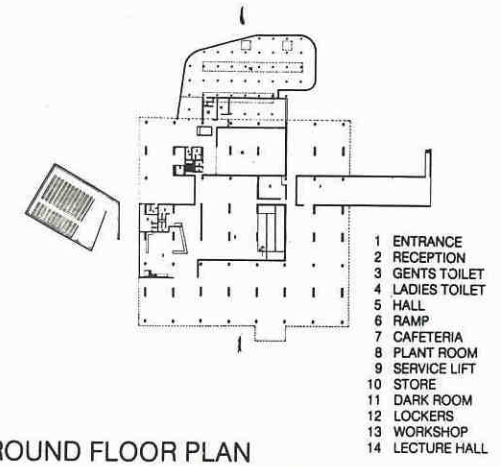
The Cultural Centre on the fringe of the Leisure Valley in Sector 10 of Chandigarh is spread over a seven-hectare linear strip of land. The approach to the campus is from an exclusive and quiet road running on its north-western side. The Centre includes a museum-cum-art gallery, a temporary exhibition pavilion, a museum devoted to the evolution of man and an art college. Only two of these buildings are discussed here.

The Museum and Art Gallery, the most impressive and massive building of the campus, is situated in the centre of this cultural belt. Like Le Corbusier's museums at Ahmedabad and Tokyo, the design of this building also reflects quiet splendour and majestic proportions. It houses a vast range of historical and contemporary paintings and sculptures. The building is square in plan, 52 by 52 metres, with reinforced concrete columns and beams. Vertically it has three levels, parts of which are either of double height or triple height, with a system of clerestory lighting on top for uniform illumination. The partially enclosed ground floor contains a reception hall, workshops and storage space besides a jutting out block for a cafeteria and a detached structure for a lecture hall. The main display area is on the first level and is accessible through a ramp in the triple-height entrance hall. The second level is utilised for administrative offices, a library, etc.

Adjacent to this museum is located a temporary exhibition pavilion. It is designed in the form of two umbrellas, each measuring 14 by 14 metres. The entrance to the pavilion is through a small lobby jutting out of the main building. It has four levels which are accessible through a staircase and a ramp. The ground floor has a reception, lounge and display areas. The basement is also used for exhibitions and the first floor has been set apart for administrative purposes. To enhance the feeling of oneness and spaciousness, a part of the ground



floor has been kept of double height. On top, the covered terrace is an ideal place for artists to work and commands a panoramic view of the Shivalik Hills. Fenestration is provided with undulatory glazing for light and aerators for ventilation. Light for the basement is taken from sunken courts. An endeavour to shade the entire structure has resulted in the use of a double roof. The space in between the two is left open to enable currents of air to move freely and keep the building cool. The structure is in reinforced concrete with the steel shuttering pattern left exposed.

The beautiful museum and art gallery

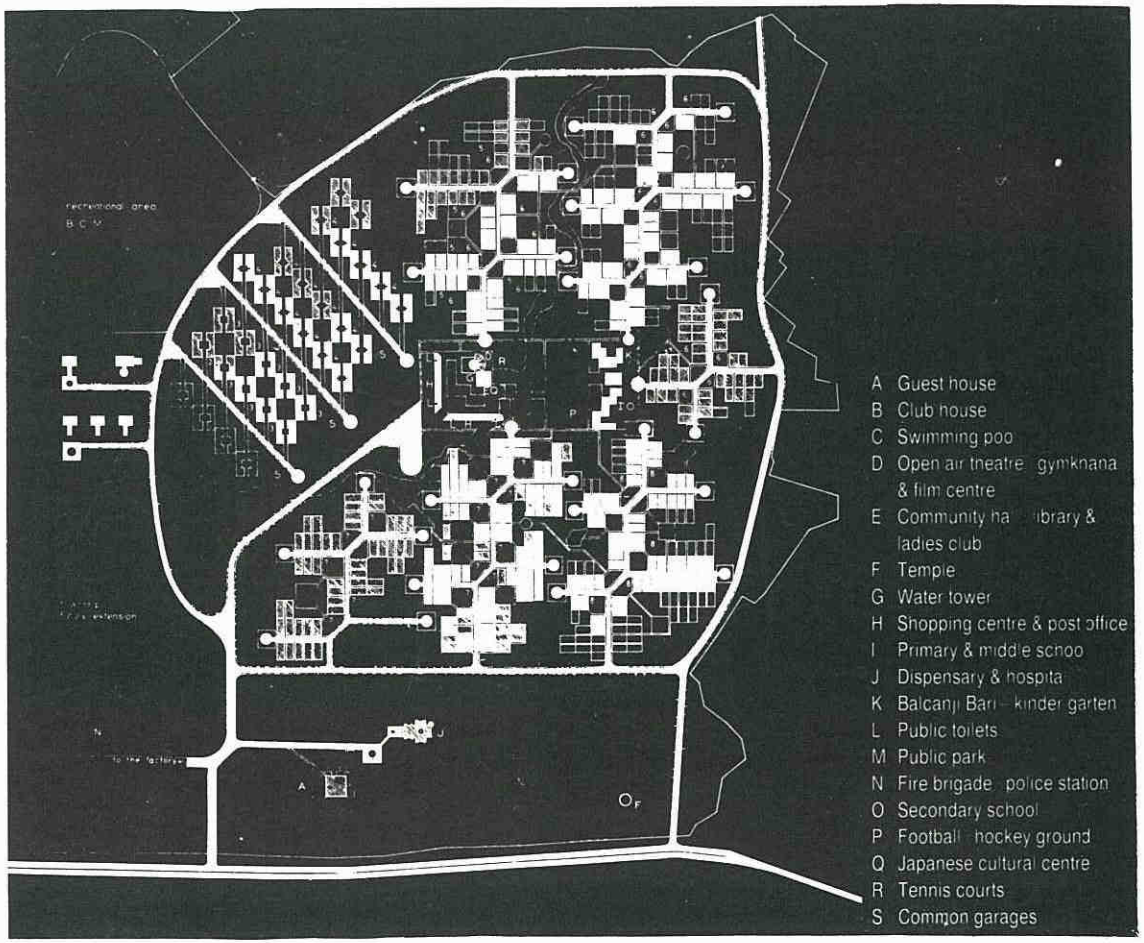
The exhibition pavilion

## GSFC TOWNSHIP, VADODARA (1964-69)

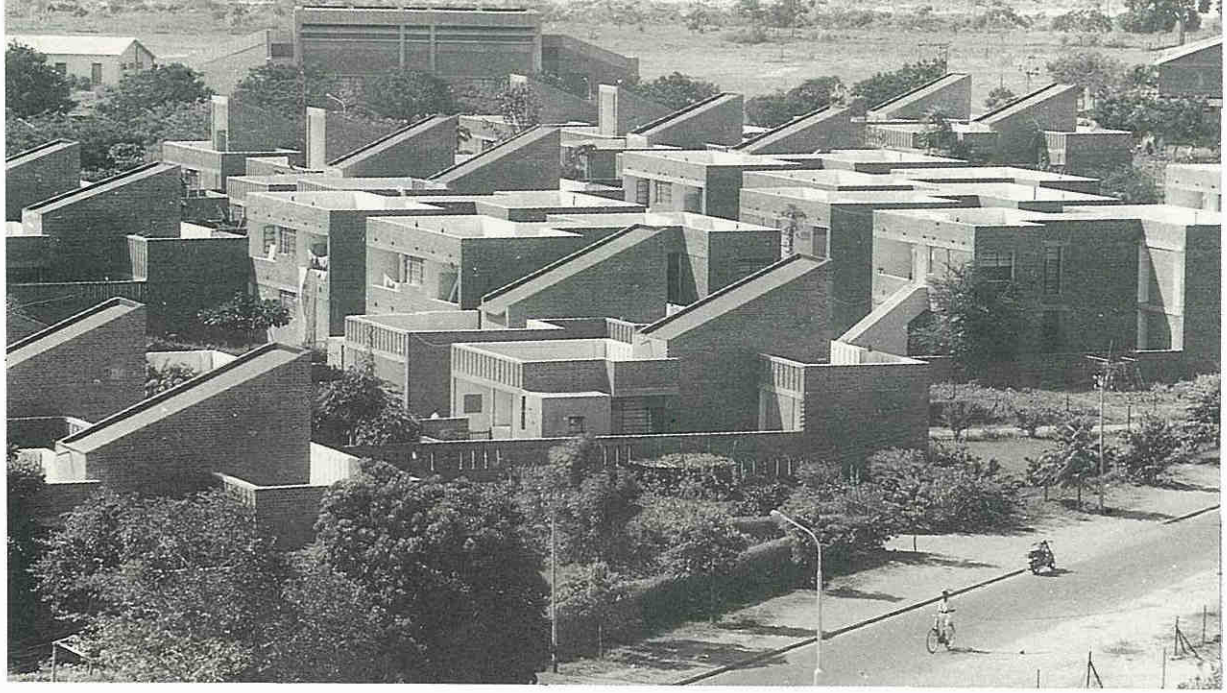
*Architect:* Balkrishna Doshi, Vastu-Shilpa, Ahmedabad.

The township of the Gujarat State Fertilisers Corporation (GSFC) at Vadodara grew out of the industrialisation policies of the early sixties according to which new industries were to be located on the outskirts of the existing cities. Housing was sorely needed to attract white-collar employees to such places. Following the State planning directives which prescribed certain categories of houses, their amenities, the cost and the area, the design of the GSFC township was evolved to suit the local life-style, the climate and local materials which could accept future changes. The architect conceived a pattern of roads converging on a central green area comprising a water reservoir, theatre, shopping centre, post office, schools, a community hall, library, swimming pool and a club house. The water reservoir is designed as the focal point. The road pattern was intended to reduce the infrastructure cost and minimise the harsh and grating effect of the afternoon sun.

To endow them with a distinctive character, the housing clusters are provided with small open spaces. The streets are profusely planted with trees for shade. At a few places the streets are bridged to provide access to upper flats or terraces. Narrow passages and bridges which act as gateways create vistas and a sense of enclosure. An attempt has been made to encourage pedestrian movement. People are less tempted to walk down streets busy with vehicular movement and, therefore, pedestrian paths circumvent the traffic-heavy streets.

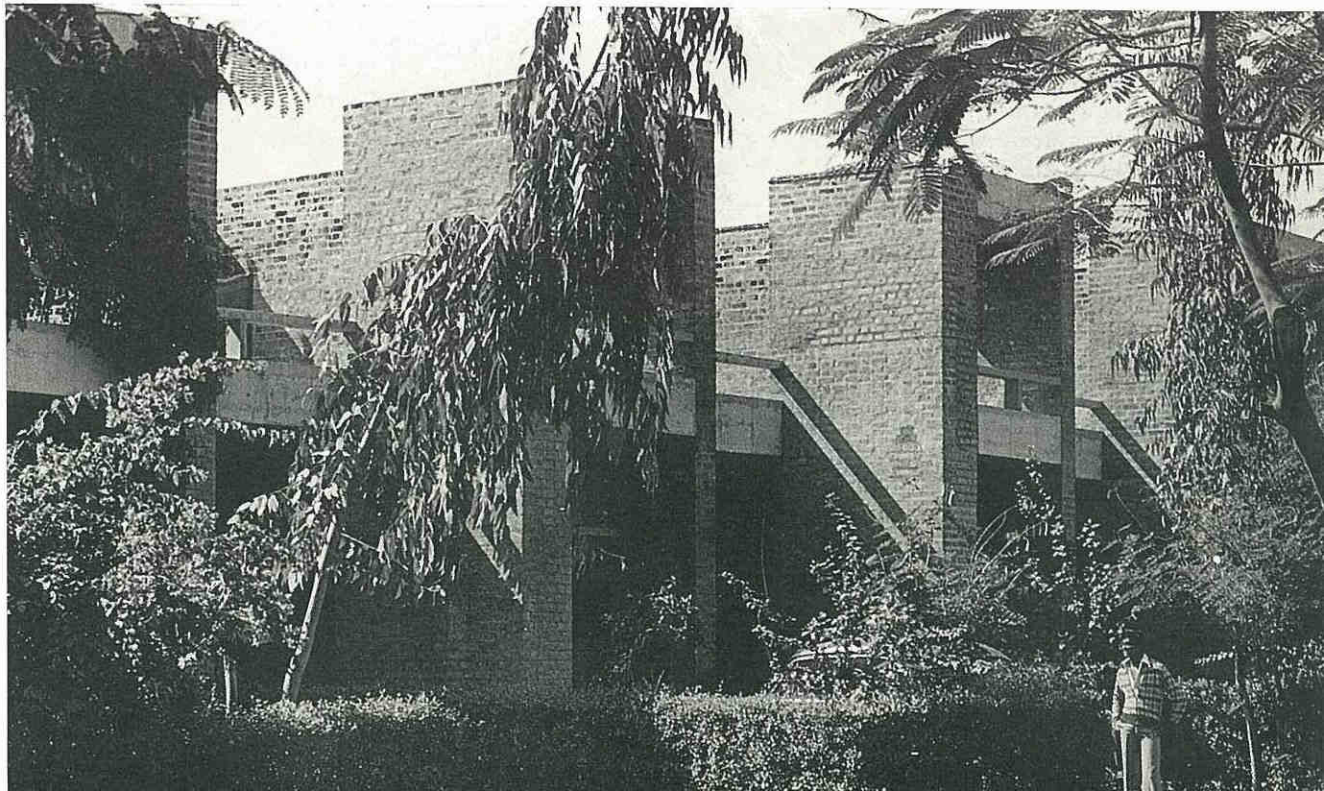



MASTER PLAN



Defying monotony of living

The design of each dwelling unit is conceived in relation to the community as a whole. The flats are arranged in rows along quiet streets. The bigger houses are provided with their own garden courts. The facades of the houses are designed to cut out glare but to allow the flow of air. Balconies, terraces, ledges, steps and alleyways are designed as usable extensions of the houses. Prefabrication or standardisation in concrete are adopted along with local methods and materials. Brick has been extensively used for load-bearing walls and the floors of alleyways.



Music of repetition and irregularity.

## SHRI RAM CENTRE, NEW DELHI (1966-69)

*Architect:* Shivnath Prasad, Delhi.

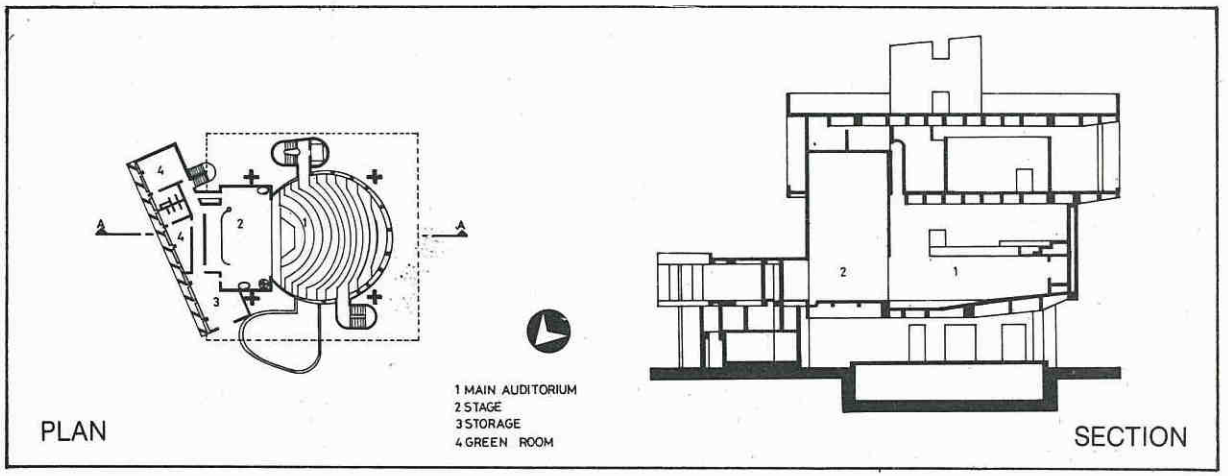
The Shri Ram Centre is located on a 0.25-hectare site on College Road in the heart of New Delhi, adjacent to other cultural institutions. The centre was set up by a private trust to promote the performing arts.

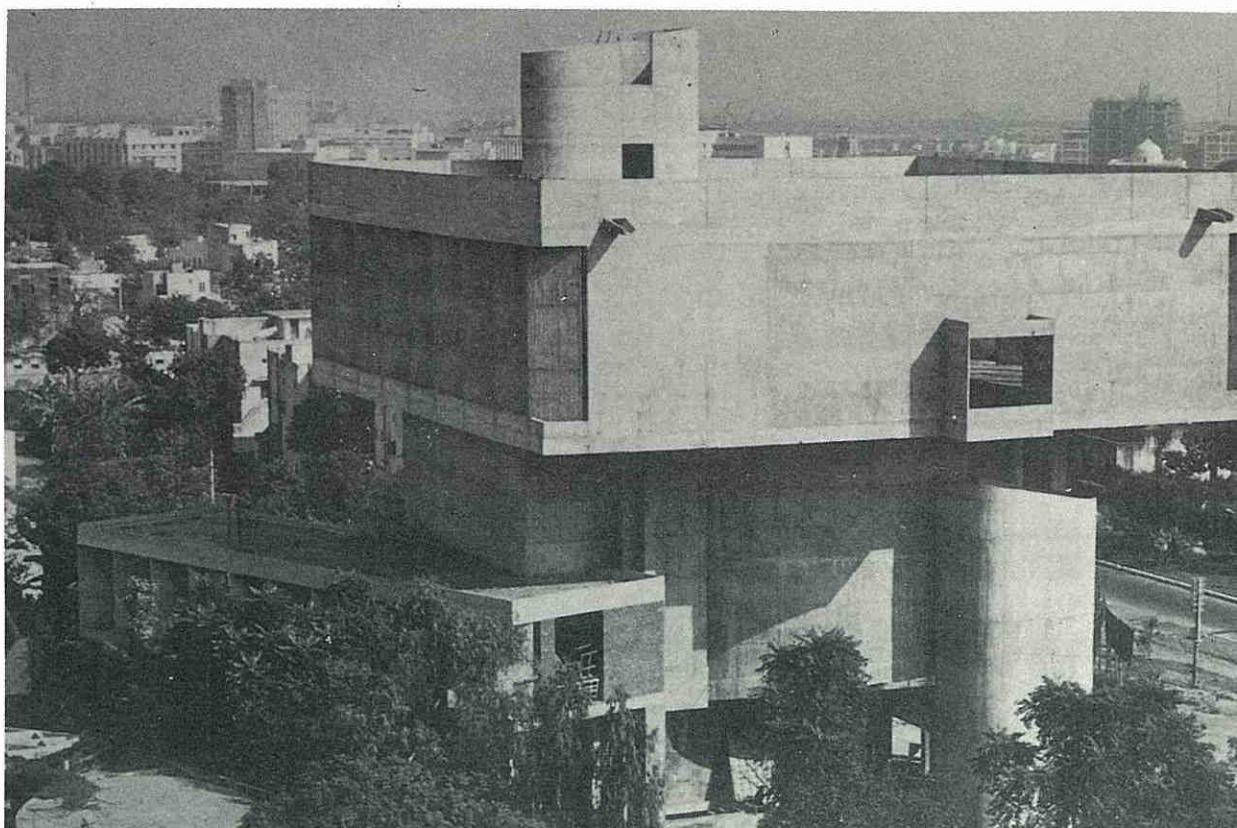
The design satisfied an extensive programme on a small site. The architect has conceived individual functions at different levels, using distinct forms bound together by independent structural supports. On the ground-floor level, space enclosure is kept to a minimum so that the entrance hall and a ticket foyer can also be used for exhibitions, and spaces flow out to natural greenery and sunshine. The ground floor has a small restaurant for use by various art groups and a caretaker's room.

The main auditorium, cylindrical in shape with a capacity for seating 600 persons, is on the first floor. It is supported on circumferential and radial beams cantilevering out from six columns. The rectangular stage cuts into a segment of a cylinder. The basement is used for experimental theatre. Above the cloak rooms is a mezzanine floor which accommodates the manager's residence and an office area.

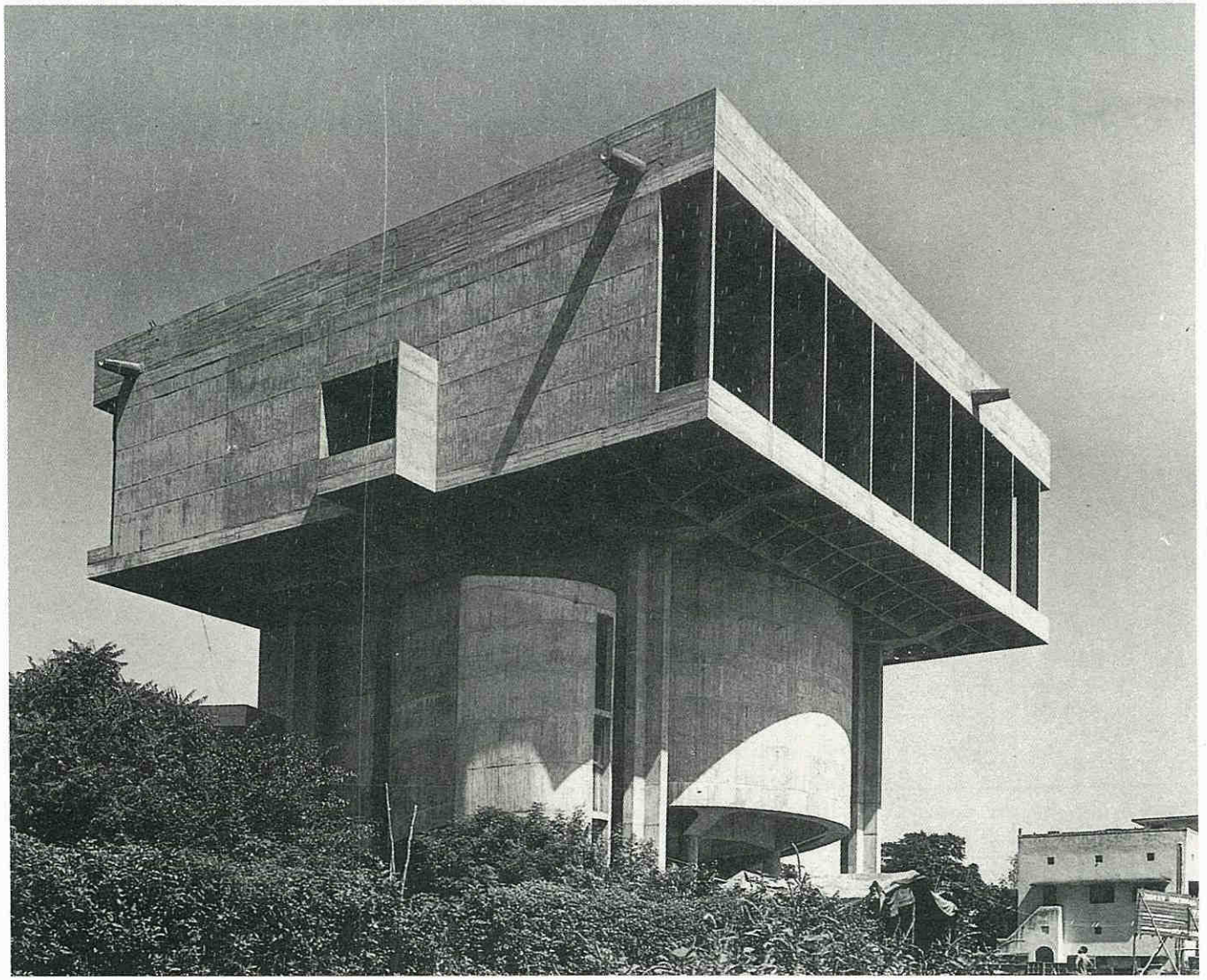
The top floor, which houses a small hall for films and puppet shows, rehearsal space and dormitories for visiting troupes, rests on four cross-shaped columns placed at 19-metre centres with six-metre cantilevers all around. The construction of the complete building is *in situ* reinforced concrete.

Recently an annexe designed by the architects Kanvinde, Rai and Chowdhury was added to the main building to house an office, library, rehearsal space and any spillover from the auditorium.



Concrete sculpture



Corbusian reflection is seen in the structure

## SPACE APPLICATIONS CENTRE, AHMEDABAD (1967-78)

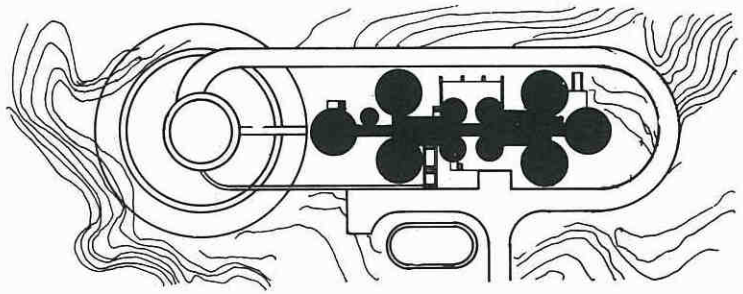
*Architects:* Bernard Kohn, France, in association with Kanvinde, Rai and Chowdhuri, New Delhi., S.D. Sharma, Deptt. of Space, Bangalore

The Space Applications Centre at Ahmedabad is one of seven such centres established by the Government of India to carry out research and development work of the Indian Space Research Organisation under the Indian Space Programme. The campus includes a number of buildings for varying activities. Only two buildings are discussed here.

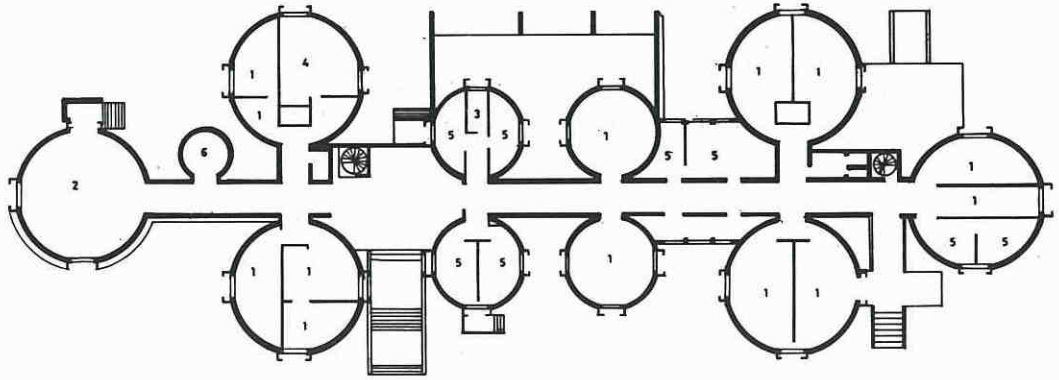
### ESCES EARTH STATION

The ESCES Earth Station, a low-height and horizontally spread out structure, is situated in close proximity to an antenna tower for technical reasons like angles of reception. Having a total built-up area of 2,850 square metres, it is developed lineally north-east of the fixed point of the antenna, confining it well within the general layout. The building is well coordinated with a number of repetitive units, clustered symmetrically along the central spine. These units are circular in shape, echoing the form of the dish antenna. The building is on two levels—a semi-basement and a raised ground level. Approached through a wide flight of steps, the ground level houses the main activity areas like control room, computer room, laboratories and offices. The basement is meant primarily for airconditioning plants, a generator room, an electric substation and stores. Light to these areas is taken through horizontal slit-windows at the ceiling level. The structure is a reinforced-concrete frame with flat slabs and brick in-fill walls, which are left exposed on the external sides. The internal surfaces are plastered and painted.

ESCES EARTH STATION



SITE PLAN



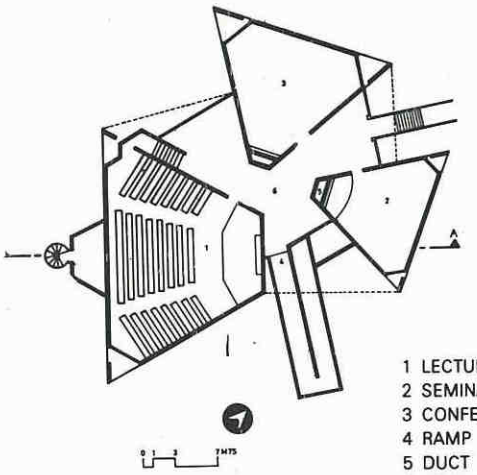
1 LABORATORY
2 CONTROL ROOM
3 CONFERENCE ROOM
4 COMPUTER ROOM
5 OFFICE
6 TOILET

GROUND FLOOR PLAN

## VIKRAM SARABHAI HALL.

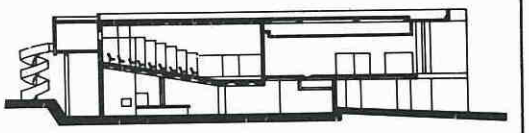
The Vikram Sarabhai Hall, a centre for interaction and communication among scientists of the campus and others involved in similar activities, is designed to hold lectures, conferences and seminars. This self-contained independent building is in its form and character the outcome of a rhetoric dialogue among the surrounding buildings on the campus. The varied requirements of three different halls are fused together into one structure, creating within it an informal lobby and display space. The three halls forming equilateral triangles, are most apt for vision, acoustics and economical construction. With a built-up area of 1,160 square metres, the building comprises two levels interconnected by an external ramp. This ramp, together with a spray pond in the front, gives a sense of direction to the entrance enclosed within a high portal. The structure is composite with load-bearing brick walls and reinforced-concrete columns at strategic points. The roof consists of precast triangular waffle shells. The external and internal surfaces are in exposed brick and concrete to blend with the architectonic expression of the surrounding buildings.

VIKRAM SARABHAI HALL



1 LECTURE HALL
2 SEMINAR HALL
3 CONFERENCE HALL
4 RAMP
5 DUCT
6 LOBBY

FIRST FLOOR PLAN



SECTION

The hall serves as a centre for interaction

*Space Applications Centre, Ahmedabad* **61**

# JODHPUR UNIVERSITY EXTENSION, JODHPUR (1968-79)

*Architect:* Uttam C. Jain, Bombay.

The Jodhpur University Campus Extension in Jodhpur city comprises a dozen separate academic, residential and service buildings. There is a cluster of lecture theatres, botany and zoology laboratories, the Faculty of Arts and Social Sciences, a central library, printing press, staff canteen and housing. Though designed for different uses and for accommodating a varying scope of work, these component parts are knitted together to form an organic whole, respecting the need for a labour-intensive design and expressing a concern for climate and economy.

All the components were conceived of as simple structures based on small and repetitive modules, capable of being built by hand, using traditional and simple means of construction which local craftsmen were familiar with. To achieve climatic adaptability, non-technological modes such as shading techniques, insulation, cross-ventilation and orientation were resorted to. Locally available materials, predominantly yellow sandstone, were extensively used to economise the cost. To make buildings responsive to the local culture, climate, people and materials, the design principles were derived from both traditional Indian architecture, and modernism.

The innovation that expresses the true spirit of the rich architectural heritage of Jodhpur city is the cluster of lecture theatres. It comprises four rectangular lecture halls joined together at the crossing of two circulation axes symmetrically. The stepped form of the cluster rises gradually from two sides to a compact, well-ventilated and shaded court in the centre. This raised court acts as the transitional space between theatres and is accessible through a ramp on one axis and wide flight of steps on both sides along the other axis. Designed amphitheatrically, these steps encourage informal talk in fair weather.

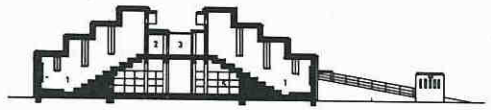
All the blocks of the botany and zoology laboratories are identically designed and grouped in a cluster with a provision for expansion in the future. Traditional elements such as thick stone masonry, parallel walls, three-metre column spacing, 3.25-metre-long stone slabs for the roof and repetitive fenestration designs are incorporated to achieve harmony with the locale. The blocks are oriented north-south with dead-end walls on the east-west side to cut off direct sunlight. A central corridor system facilitates the incorporation of services at the mezzanine levels. The services run vertically through the shafts provided along the sides of the corridor. Window openings are kept comparatively large to meet the specific demand for natural light at the work levels.

The central library is designed as a square block on the principle of the Greek cross. The split level stacks are positioned at the geometrical crossing in the centre, which houses the services and circulation areas. L-shaped, double-height reading halls are located at the outer corners of the building in close proximity to the source of natural light. This juxtaposition not only helped in minimising the distance between the books and the readers but also in achieving a disturbance-free environment inside the reading halls.

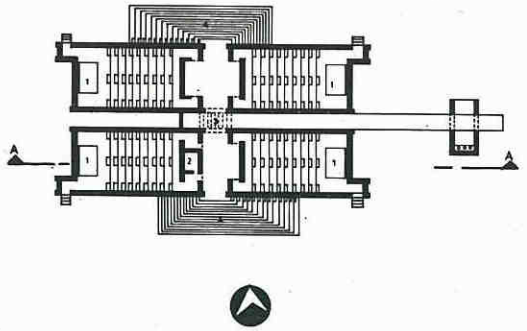
The composite Faculty of Arts and Social Sciences wing was planned to accommodate nine departments. The simple U-shaped plan encloses a central quadrangle to be utilised for outdoor inter-departmental activities. The classrooms, seminar rooms and research cubicles are arranged along both sides of the central corridor, which is illuminated by openings at the ends and narrow cutouts in the centre along its length. The width of the corridor increases at the points of access to different rooms. The expressive rhythm emer-

LECTURE THEATRES

1 LECTURE HALL
2 PROJECTION ROOM
3 COURT
4 OUTDOOR SITTING
5 STORE



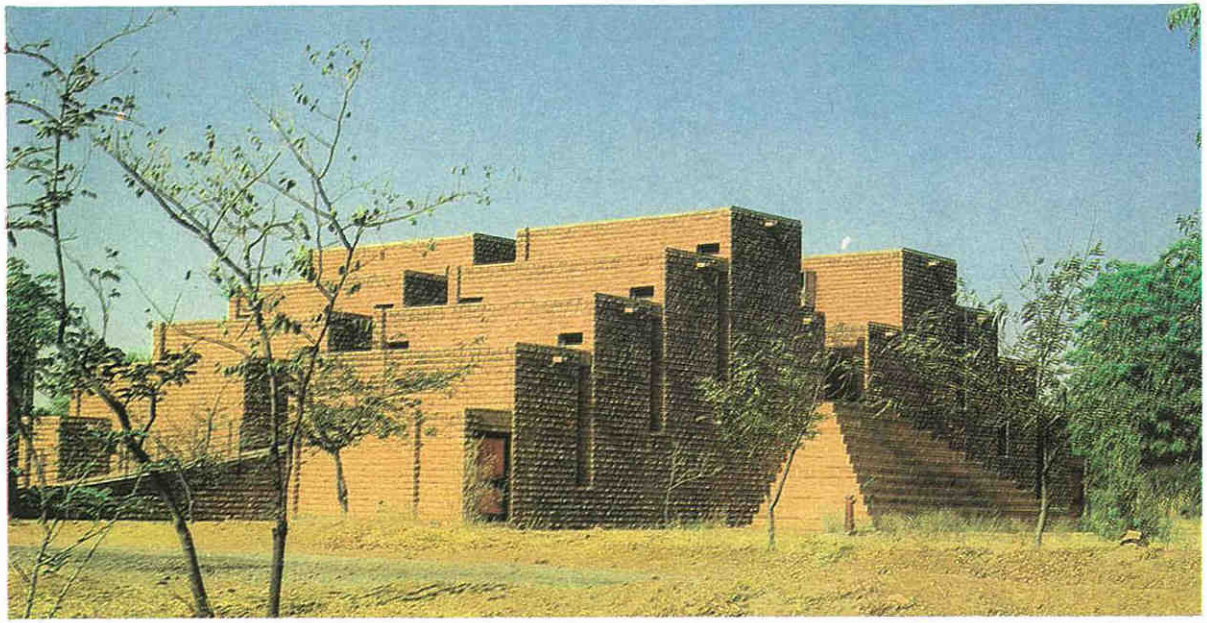
SECTION



PLAN

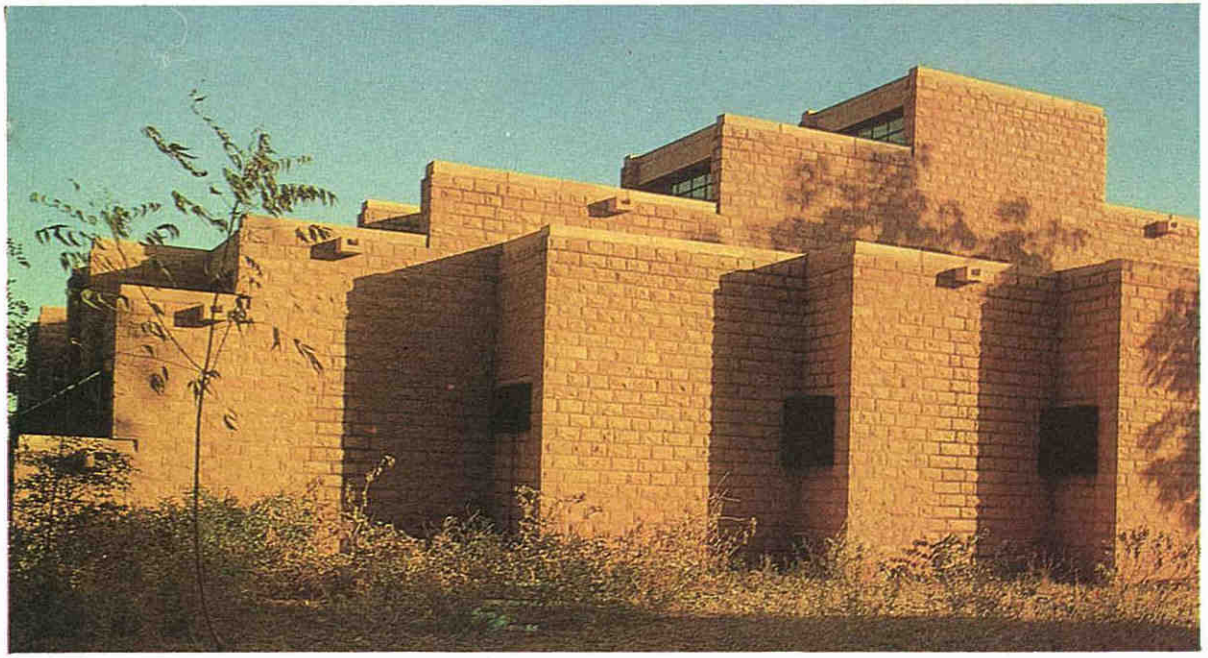
ging from a harmony between the load-bearing stone-masonry walls, modulated roof structure, piers and low baffle walls screening the windows is reflected throughout. Uniquely sculpted water tanks located over the vertically extended staircase blocks give rise to a richly modelled building form.

The printing press is, like most of the other buildings on the campus, an exemplar of two typical themes—repetitive modules and stepped section. The stepped section helped in developing a series of clerestories which provide natural light for the central printing area. The plan also incorporates a series of small "servant" spaces peripherally around the main printing area.

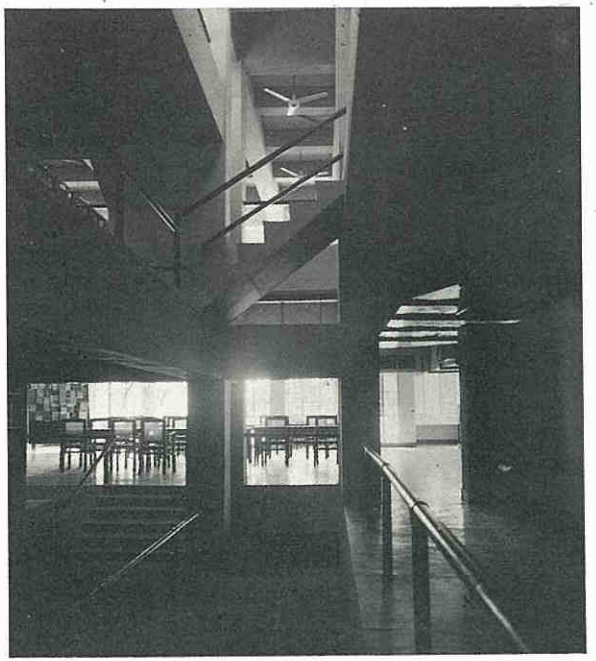


Interesting lecture theatres as educational components

Utilisation of local stone: Stepped sections and small modules



Split floors for wholesome architecture



## CENTRAL LIBRARY, SRINAGAR (1969-73)

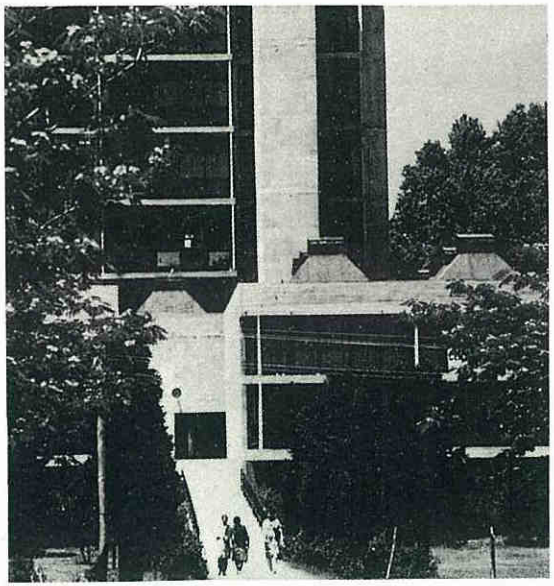
*Architect:* Shivnath Prasad, New Delhi.

The Central Library in Srinagar in the State of Jammu & Kashmir is built on a 1.5-hectare reserved site on the campus of Kashmir University. The site has a backdrop of mountains with greenery all around.

The building has a square plan with 9,375 square metres of built-up area. The ground floor accommodates an oval-shaped auditorium with green rooms, a cafeteria, kitchen, conference and seminar rooms, a book-binding section, areas for public exhibition and display, besides sundry rooms and toilets. These facilities are provided for the public on the ground level so as to ensure serenity for the reading areas. The main library, which is directly approached by a ramp from the entrance plaza, is placed on the first-floor level. It contains the periodicals section, offices and the textbook and reference sections. To get adequate light, the reading areas have been kept near the windows. Pyramid-shaped sky-lights are provided in each structural grid to light the interiors of the library floor uniformly. Spouts are provided to drain out rainwater from the terrace.

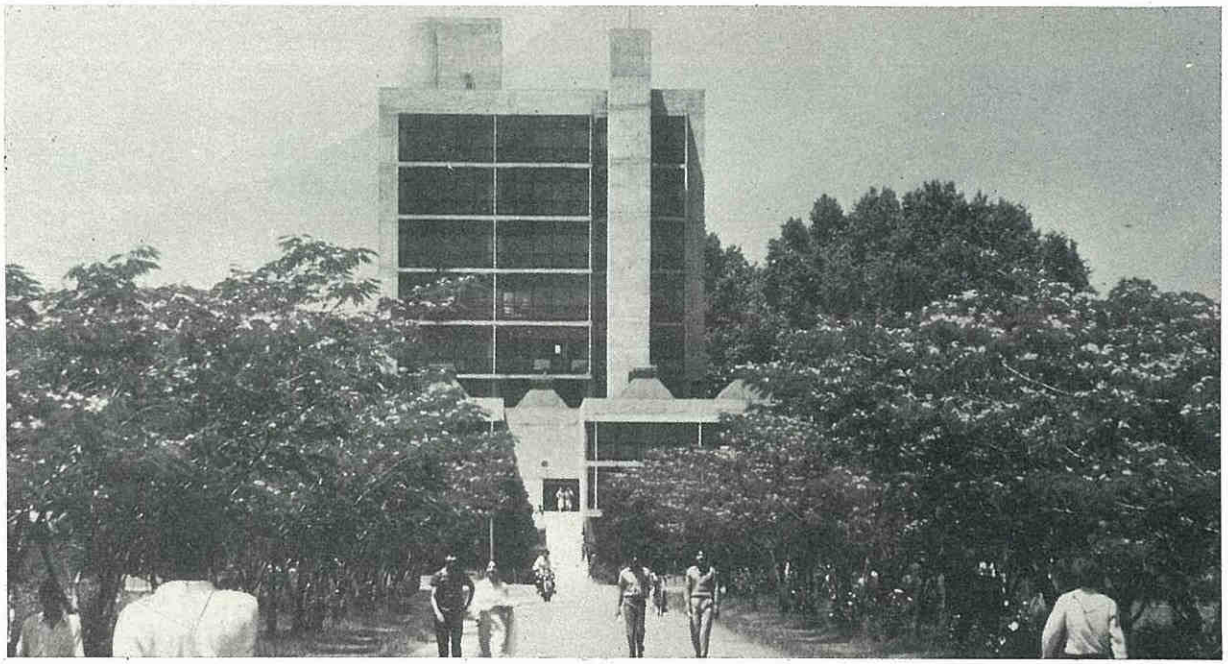
A mezzanine floor above the main library has 20 research cubicles, besides reading space. On the second-floor level, the building becomes smaller in plan and rises vertically. A darkroom, the photostat facility and toilets are provided on this floor. The third floor houses a tutorial room, lecture hall, offices, a teachers' room, exhibition space and reading space. The upper four floors contain book-racks.

Library of books blends well with the library of nature



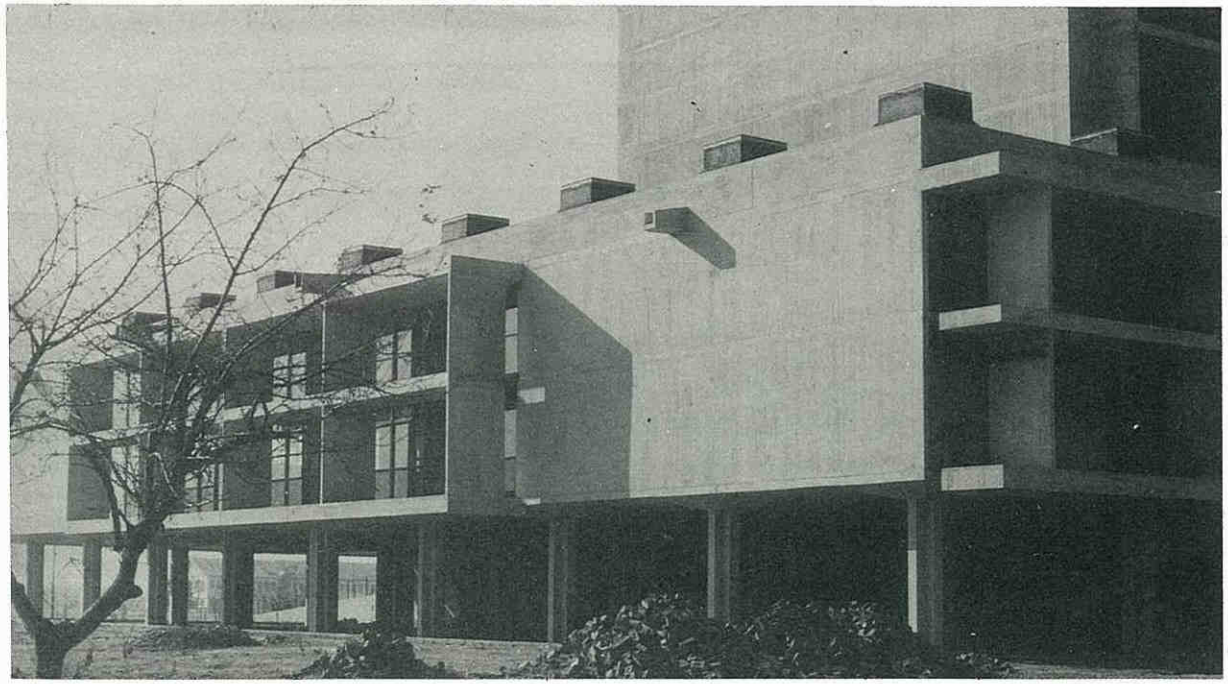
A Detail

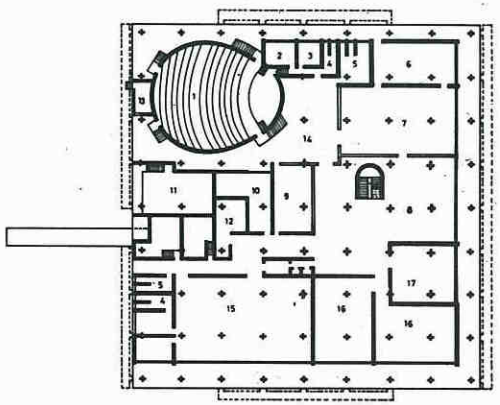
The windows are protected from the sun and rain by *brise-soleil*. To capture the scenic splendour of the mountain ranges and to get the maximum light, the architect intentionally enlarged the size of the glazed openings. Stairways, elevators and a ramp are provided for vertical movement. The staircase and lift towers adding verticality to this temple of learning stand in contrast to the rugged profile of the mountains. The building is a reinforced-concrete-frame structure with exposed shuttering patterns. Flat slabs and beams are supported on a grid of cross-shaped columns having a centre-to-centre distance of six metres.



Modernism comes to Kashmir

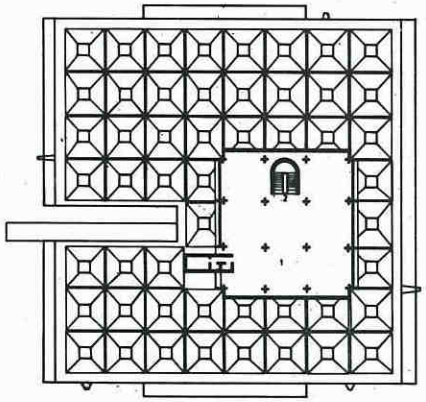
Grammer and vocabulary of sixties





1 AUDITORIUM
2 GENTS GREEN ROOM
3 LADIES GREEN ROOM
4 L. TOILET
5 G. TOILET
6 KITCHEN
7 CAFETERIA
8 PUBLIC EXN. & DISPLAY SPACE
9 STAFF ROOM
10 BOOK BINDING
11 PLANT ROOM
12 RECORD ROOM
13 PROJECTION ROOM
14 LOBBY
15 TECHNICAL
16 CONFERENCE ROOM
17 SEMINAR ROOM

GROUND FLOOR PLAN




TYPICAL STACK ROOM FLOOR PLAN

## GURU NANAK DEV UNIVERSITY, AMRITSAR (1970-85)

*Architect:* Sachdev Eggleston Associates, New Delhi.

Guru Nanak Dev University is a premier education centre located on a 200-hectare site abutting on the Amritsar-Lahore section of the Grand Trunk Road. The compact and functionally articulate campus was planned for student population of 7,500 and a supporting staff of about 1,000. The concept is based on the "zonalisation of various activities". Thus there are academic, students' housing, staff housing, and sports and recreational zones.

The academic zone is placed in the centre to ensure easy and direct access from various zones, thus eliminating thoroughfares. Boys' and girls' halls of residence are separately located on the north-east and south-west corners, respectively. The sports and recreational zone, envisaged to comprise an open-air theatre, a stadium, a gymnasium and various sports fields, extends along the south and east boundaries. Staff housing comprising five types of houses is placed in the north-west corner. A green belt running behind this sector allows for a park and children's playing area, undisturbed by traffic.

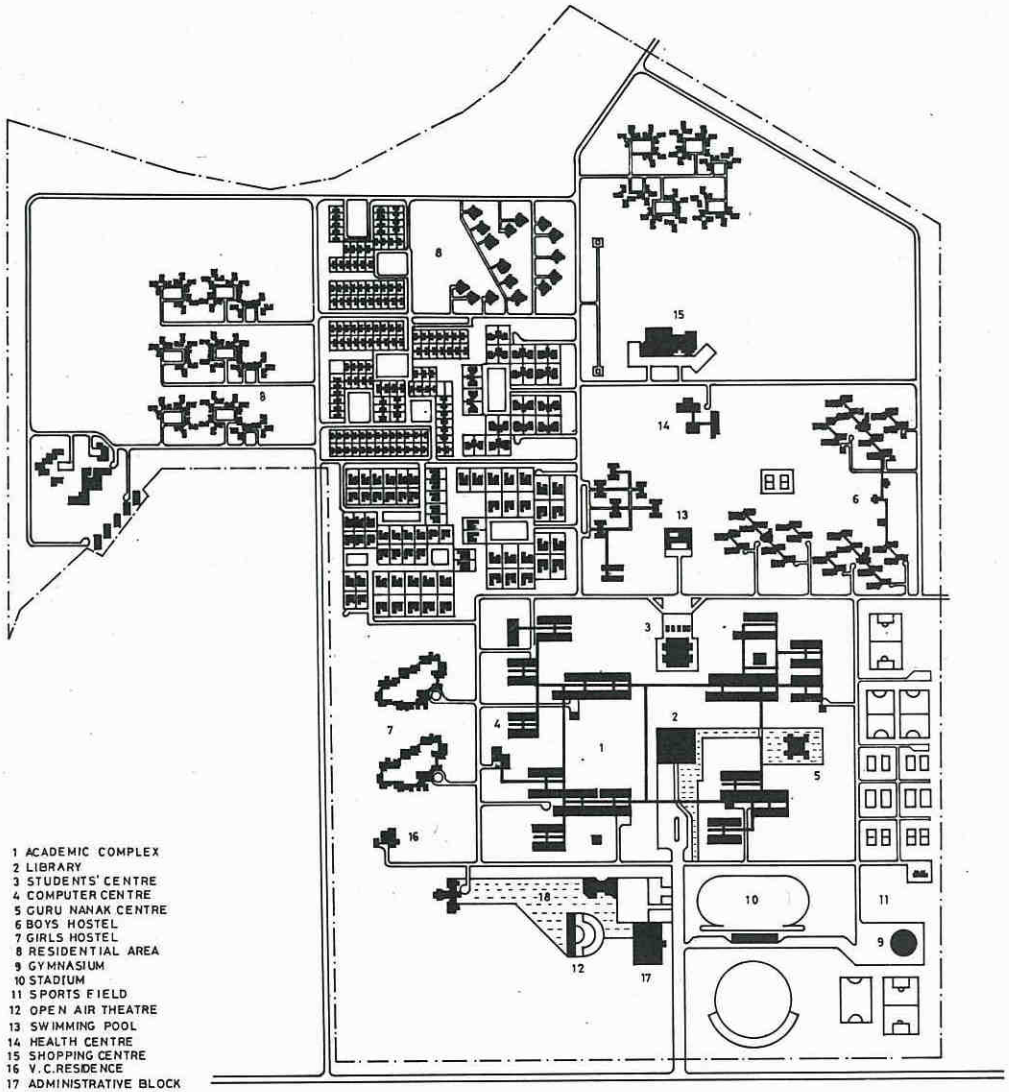
The campus is accessible from the main road through a ceremonial way passing through the greens of the recreational zone and leading to the library. In addition to this main approach, the housing and boys' hostel zones have direct access roads from the north, south and east. Internally, a peripheral road runs around the academic zone with parking lots at strategic locations, leaving the entire area for pedestrians.

The Faculties of Chemistry, Physics, Mathematics, Biological Sciences and Humanities are placed in the four corners of this academic rectangle with sufficient open spaces in between. These spaces contain a student centre, the library, an administrative block, Guru Nanak Bhavan and a computer centre. The library, being in the middle of the academic core, becomes the focal point of academic activity and its position affords increased accessibility. The faculty wings are designed as clusters of twin blocks, each pair joined together by detached corridors which ultimately extend to encompass the entire complex.

Except for the library and the administrative block, all the buildings are three to four-storeyed and are oriented such that their longer sides face the north and south. The east and west facades are generally blank and are well sculpted for easy identification of the blocks. Landscape elements like plants, earth forms, water bodies and street furniture are designed for function, comfort and the visual enhancement of the campus as a whole.

The structural systems adopted are load-bearing brick walls with reinforced-concrete lintels and slabs for the smaller buildings, composite structures for the medium-sized buildings and reinforced-concrete frame for the bigger buildings. All the external surfaces of the buildings are either in exposed brick or concrete or a combination of both.

Administrative block




LAYOUT PLAN

Hostel homes: Colour of individuality

Underplaying brick for warmth of living

Reductive art of sculpture applied to brick and concrete

The Arts Block

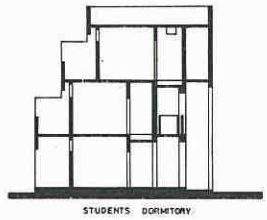
## INDIAN STATISTICAL INSTITUTE, NEW DELHI (1970-75)

*Architect:* Anant Raje, Ahmedabad, in association with Kanvinde, Rai and Chowdhury, New Delhi.

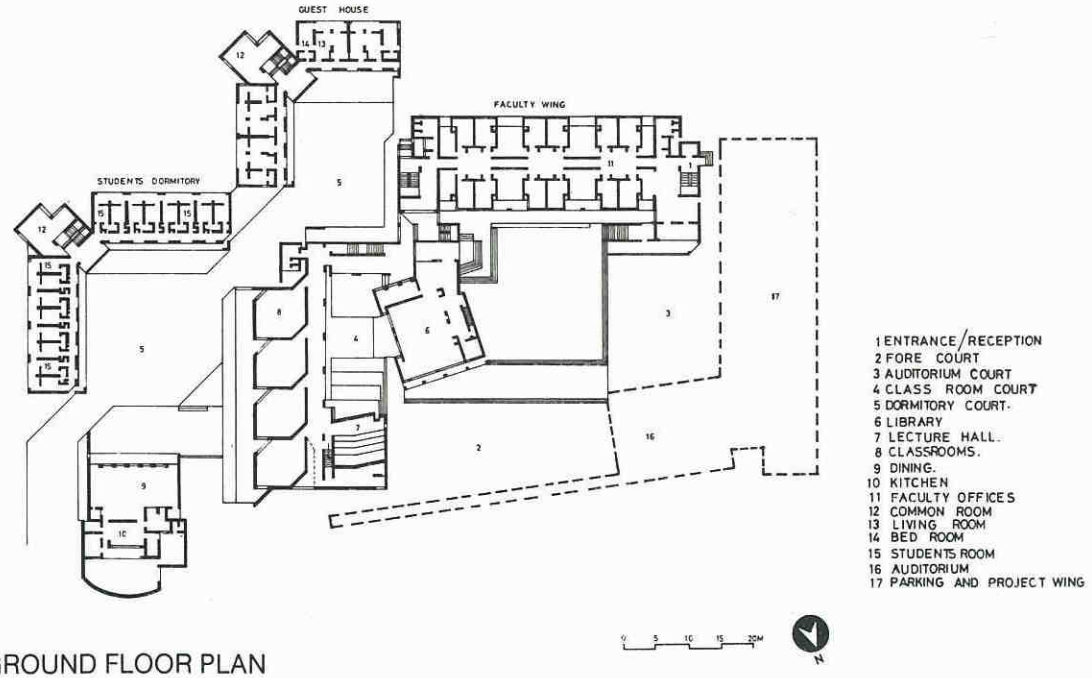
The Indian Statistical Institute is located on a 6-hectare long and narrow site with a backdrop of the historic Qutab Minar. The complex covers an area of 5,000 square metres. It consists of primarily three sections—the academic section to the north, dormitories in the east and faculty housing in the south.

The academic section comprises a classroom block, the library, faculty offices, a wing projected for the future and an auditorium. The concept is based on a series of courts where the students and faculty members can intermingle. The two-storeyed library building, placed on a raised arrival plaza with a slight angular twist in the axis, is the focal point of the academic wing. To the east of it is the classroom block enclosing its own amphitheatre. The classroom spaces are created by folding the walls continuously. This lends additional structural strength to the brick masonry.

The plan of the faculty offices facing the entrance plaza is centred around a double-loaded corridor with a lobby to connect the corridor with the rooms. Alternate pairs of rooms are pushed in from the exterior edge of the plan to create a shadow pocket. There are two major planes on all exterior surfaces—one that makes a structural opening and the other that receives the in-fill of glass.



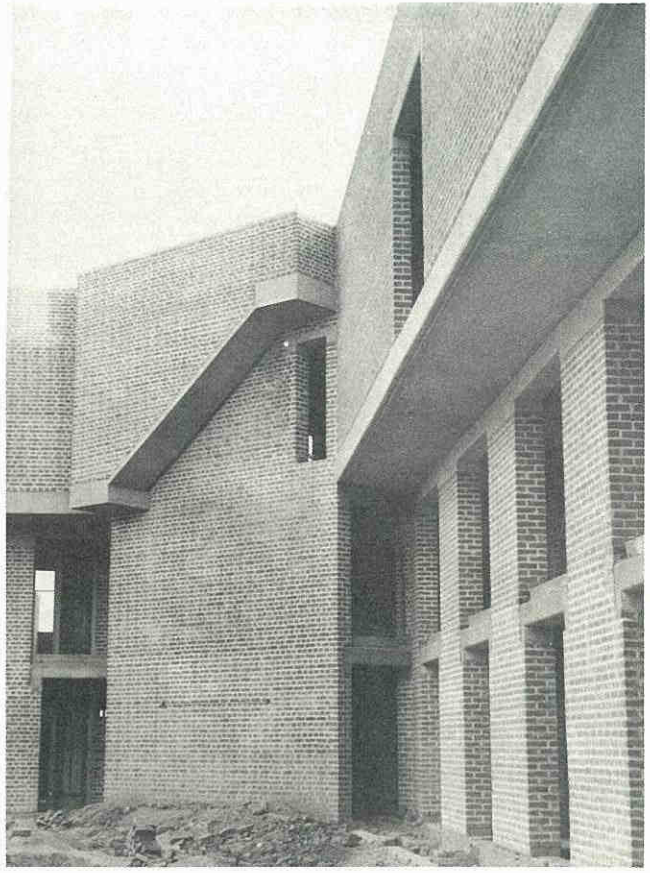

SECTION




GROUND FLOOR PLAN

Entrance to library and Offices

Faculty Offices



Dormitory stairs

The L-shaped students' dormitories partially enclose three diagonally-linked courts. The concept is based on a stepped section with each floor moving outwards beyond the edge of the floor. This creates open-to-sky terraces on one side and shade for the floors below on the other. The corridor runs along the rooms within the space offered by the shift in the floor. Club spaces are incorporated in the corner connecting the two arms of each dormitory. The reinforced-concrete-frame structures allow for flexibility in organising interior spaces. All the load-bearing external walls are in exposed brick.

## GANDHINAGAR (1970-90)

*Planners:* Office of the Chief Town Planner & Architectural Advisor, Capital Project, Ghandhinagar.

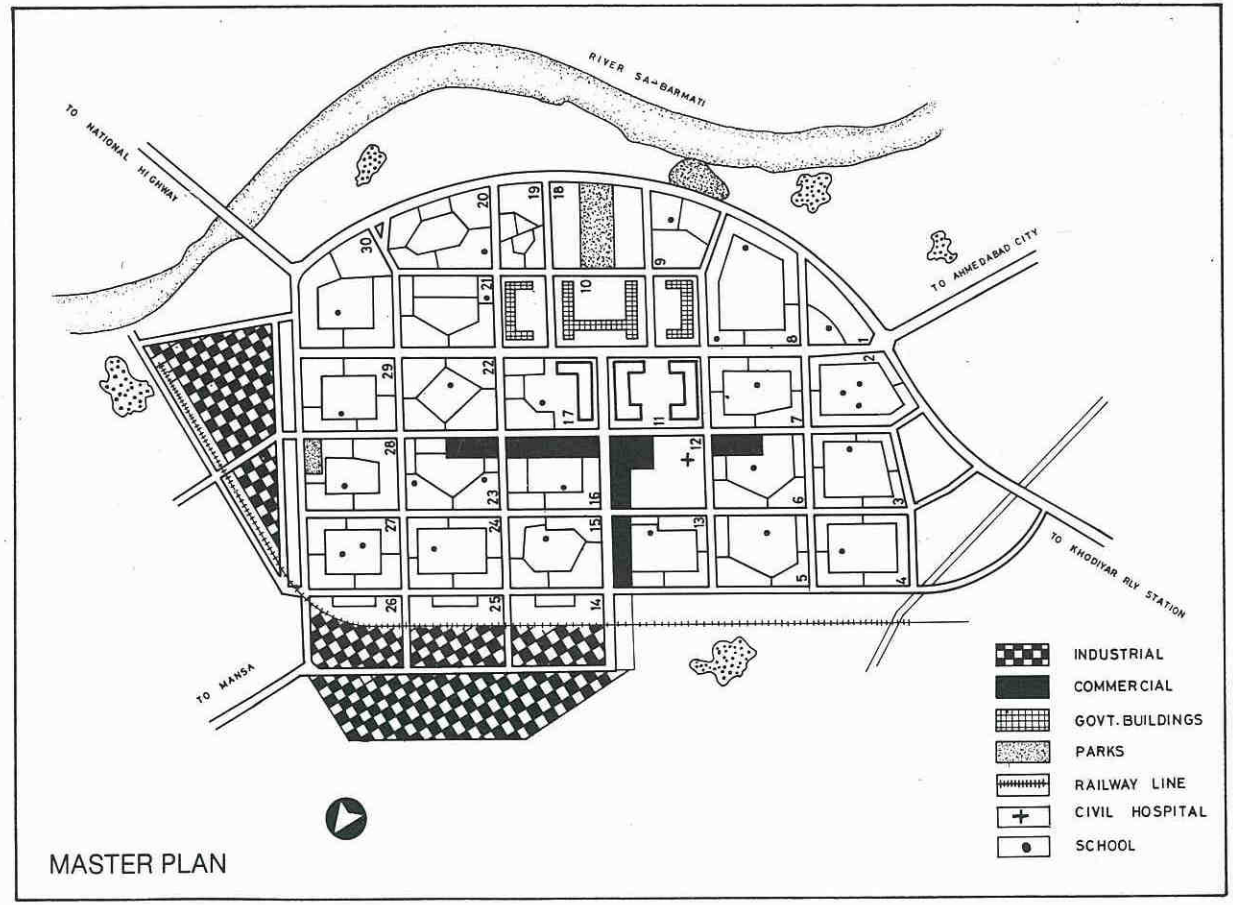
Gandhinagar, the capital city of the State of Gujarat, is situated on the western bank of the River Sabarmati, about 25 kilometres north of Ahmedabad. As its name suggests, the new city has been dedicated to Mahatma Gandhi—the Father of the Nation. In a span of two decades it has bloomed into an ideal township with comfortable residences, well laid-out roads flowering trees on either side forming vistas, and buildings with simple and straightforward facades.

The city occupies an area of 57 square kilometres and has an elevation 25 metres higher than that of Ahmedabad. The main roads K, Kh, G, Gh, Ch, Chh and J stretch from the north-east to the south-west. Roads numbering one to seven cross them at right angles, stretching from the south-east to the north-west, dividing the city into 30 rectangles known as sectors.

Instead of a centralised business district as in Chandigarh, a linear commercial belt extends along the north-west. The Capitol Complex, comprising the Legislative Assembly and the Civil Secretariat, is located in the south-east along the Sabarmati. The Industrial Area is located on the north-eastern side of the city. A belt of trees and parkland between the Industrial Area and the city acts as insurance against smoke and fumes.

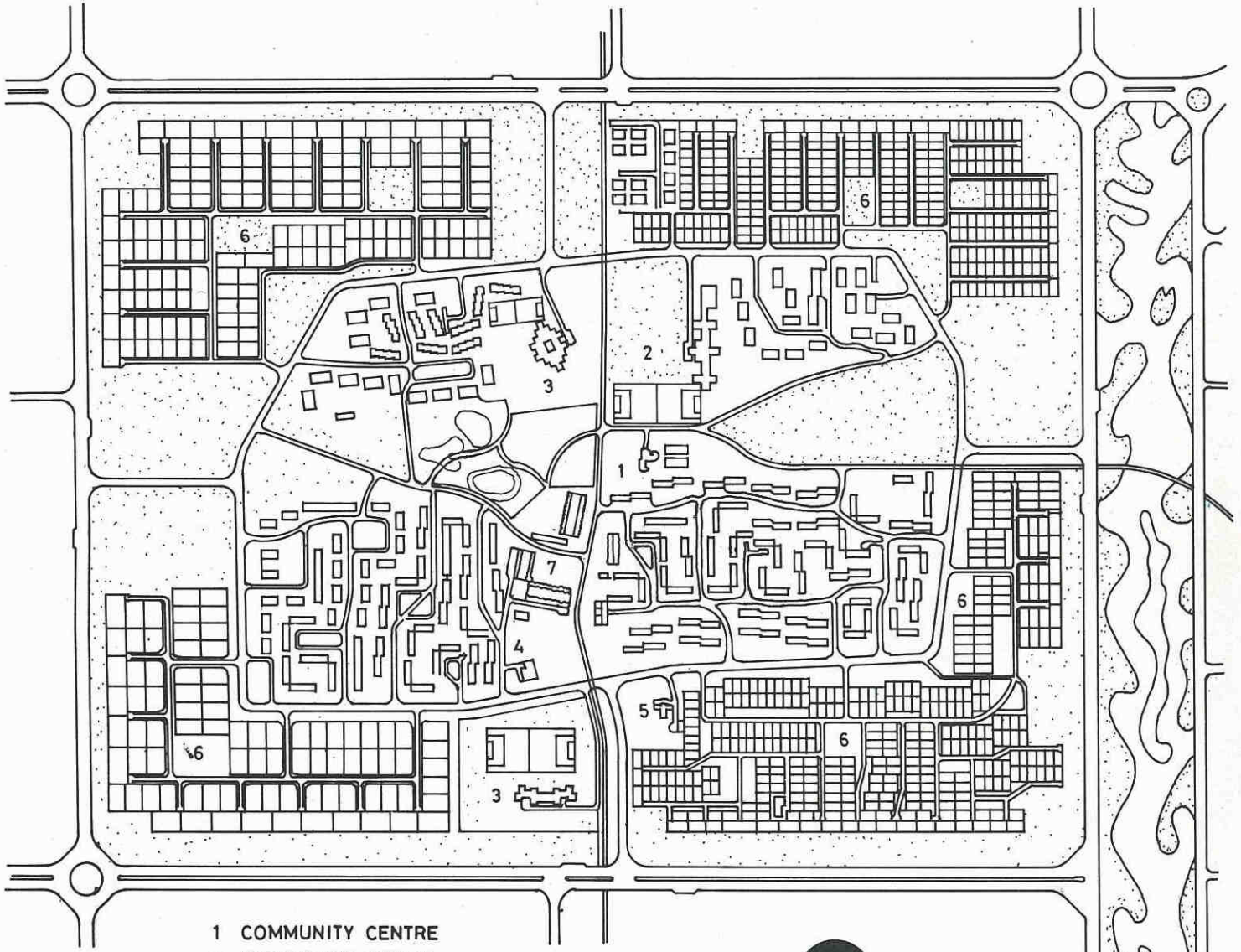
Although similar to Chandigarh in many respects, Gandhinagar has a different system of residential sectors, the latter having sectors smaller in size as compared to the Chandigarh sectors. Each sector with an area of 75 hectares, measures 1,000 by 750 metres and is planned for an average population of 11,000 with a density of 146 persons per hectare. High-density government housing is located in the heart of the sector and private housing is on the periphery. Each sector has four entry points from all the sector-dividing roads. These access roads are linked with a central loop road which is further connected to the distributary roads giving individual access to the private residences and the government quarters.

Recreational, commercial, cultural and educational facilities are provided along the central green strips across each sector.



MASTER PLAN

SECTOR 29




PLAN

Gandhi Labour Institute, Ahmedabad

# Section III (1971 to 1980)

| |
|---|
| Floating Restaurant, Sirhind |
| Milk Processing Plant, Mehsana |
| University Auditorium, Tirupati |
| Matrimandir, Auroville |
| Madura Club, Madurai |
| Press Enclave, New Delhi |
| M.C. Zoological Park, Chhatbir |
| Dena Bank, Ahmedabad |
| Modern School, New Delhi |
| Rock Garden, Chandigarh |
| National Centre for Performing Arts, Bombay |
| Central Institute of Educational Technology, New Delhi |
| VST Housing, Hyderabad |
| Nehru Science Centre, Bombay |
| Indian Institute of Management, Bangalore |
| Sri Dasmesh Academy, Anandpur Sahib |
| Low-Cost Housing, Rajkot |
| Sangath, Ahmedabad |
| Administrative Complex, Madhya Pradesh Electricity Board, Jabalpur |
| Beach House, Bombay |
| Asian Games Village, New Delhi |
| Asiad Auditorium, New Delhi |
| Gandhi Labour Institute, Ahmedabad |
| Baha'i House of Worship, New Delhi |
| Majorda Beach Resort, Goa |
| SCOPE Office Complex, New Delhi |

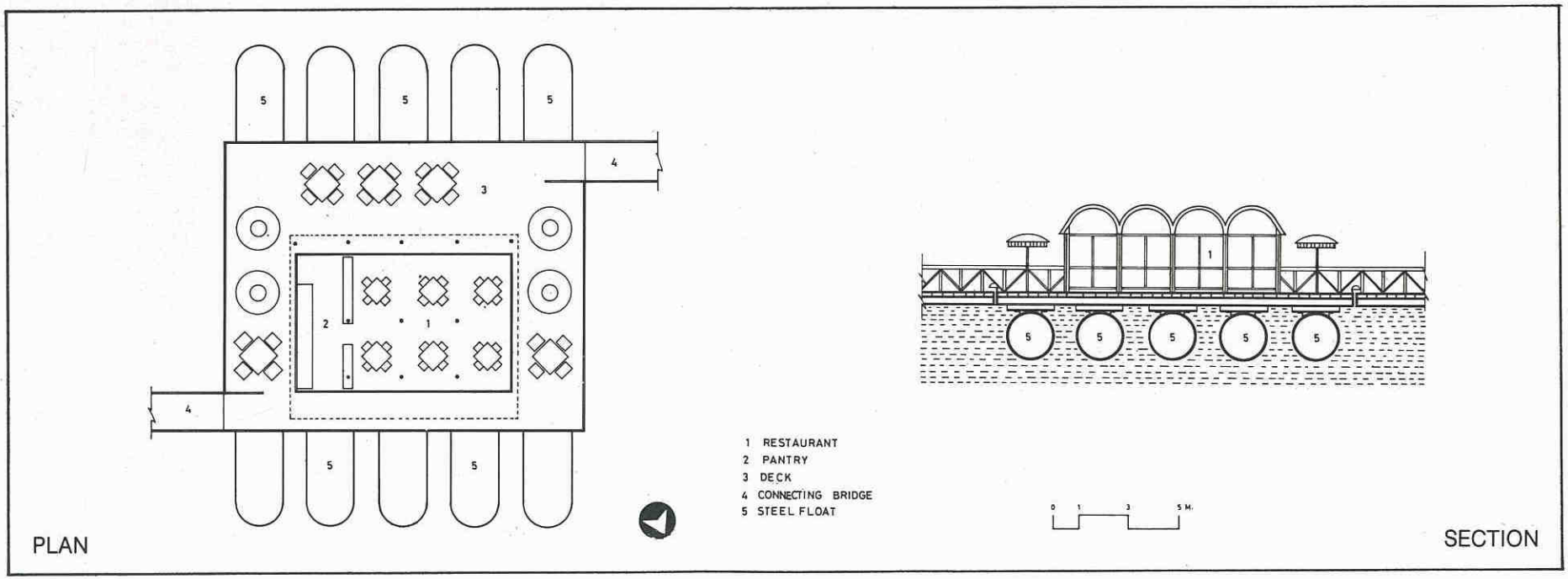
## FLOATING RESTAURANT, SIRHIND (1971-72)

*Architect:* Jeet Malhotra and Amar Rajinder Singh, Department of Architecture, Punjab.

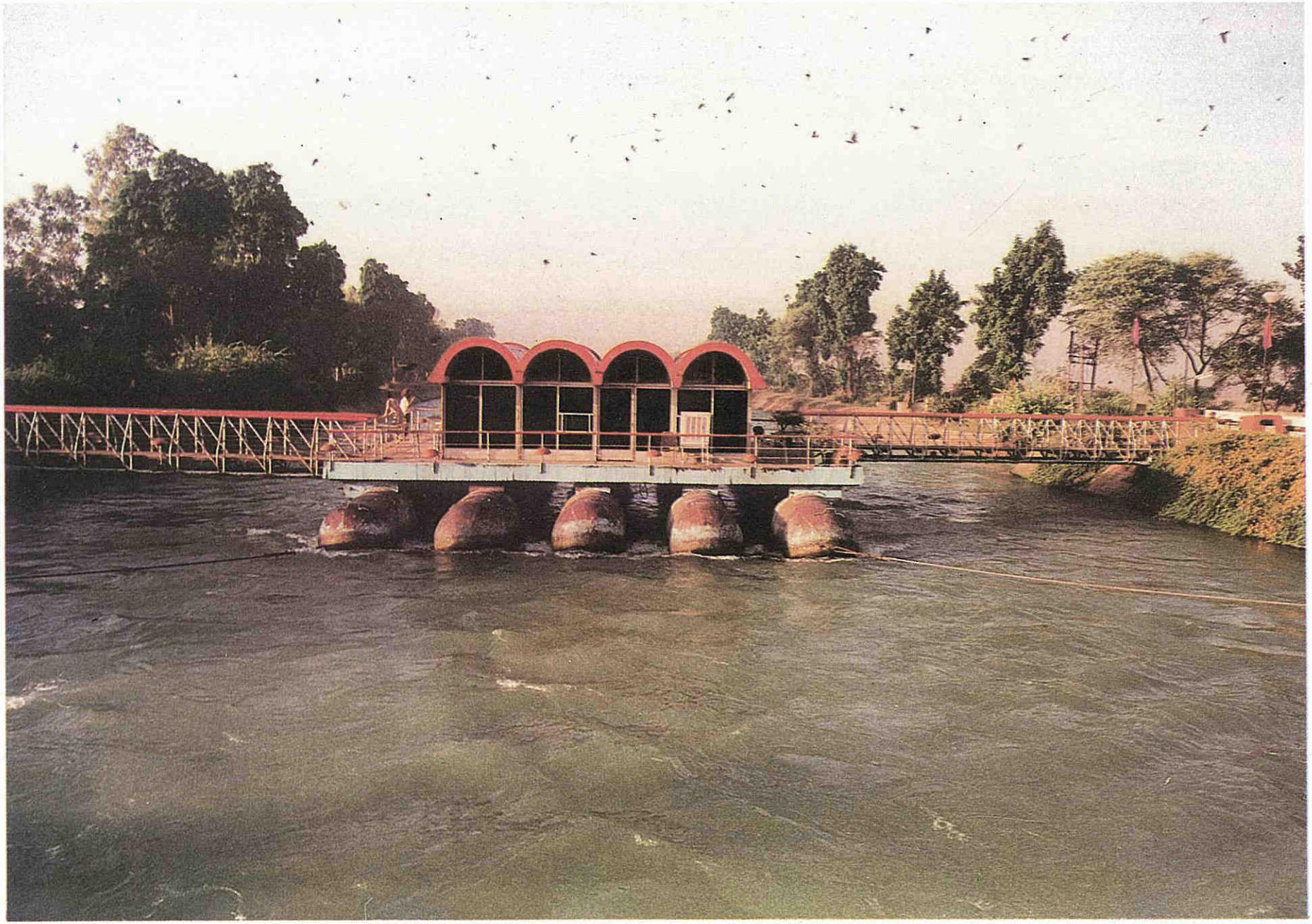
Owned by the Punjab Tourism Development Corporation, the Floating Restaurant at Sirhind is a roadside facility for the tourists and travellers to relax a while. It is the first floating structure of its kind in India. Located on the waters of the Bhakra Mainline Canal between Gobindgarh and Sirhind, it is approachable from Sher Shah Suri Marg.

The canal is 6 metres deep and 45 metres wide at this point. A lightweight steel structure with a vaulted roof rests on a wooden deck which floats on five cylinders tied together. The deck serves as an extension of an indoor seating area and is bridged to both banks of the canal. Due to the uniqueness of its structure and the immanence of celestial light in the natural setting, the restaurant is a popular pleasure spot. Inside the restaurant, part of the wooden flooring gives way to transparent glass panels, enabling the visitors to see the flowing blue water underneath. Another block with an identical roofscape is situated on the western bank of the canal. It contains the principal kitchen, a beer bar and a restaurant.

This restaurant complex forms part of a larger concept—a linear floating tourist village envisaged to contain 35 floating huts with facilities for water sports and recreation. Spreading over a 2-kilometre stretch of the canal, these huts will be accessible from the roads on the banks of the canal. A special kind of floating swimming pool, made of expanded metal and filled with flowing water from the canal, has also been conceived as an integral part of the complex. To meet the energy requirements of the complex, micro-hydroelectric generators at various falls in the canal have been conceived. A special system of flexible pipes will drain sewage from the tourist huts and pump it out to the adjoining cultivated land after treatment, thus avoiding pollution. The village, when fully realised, will be nonpareil in the subcontinent and could act as a source of inspiration for future generations to think in terms of saving precious agricultural land from expanding urbanisation.



The restaurant provides culinary and visual pleasure



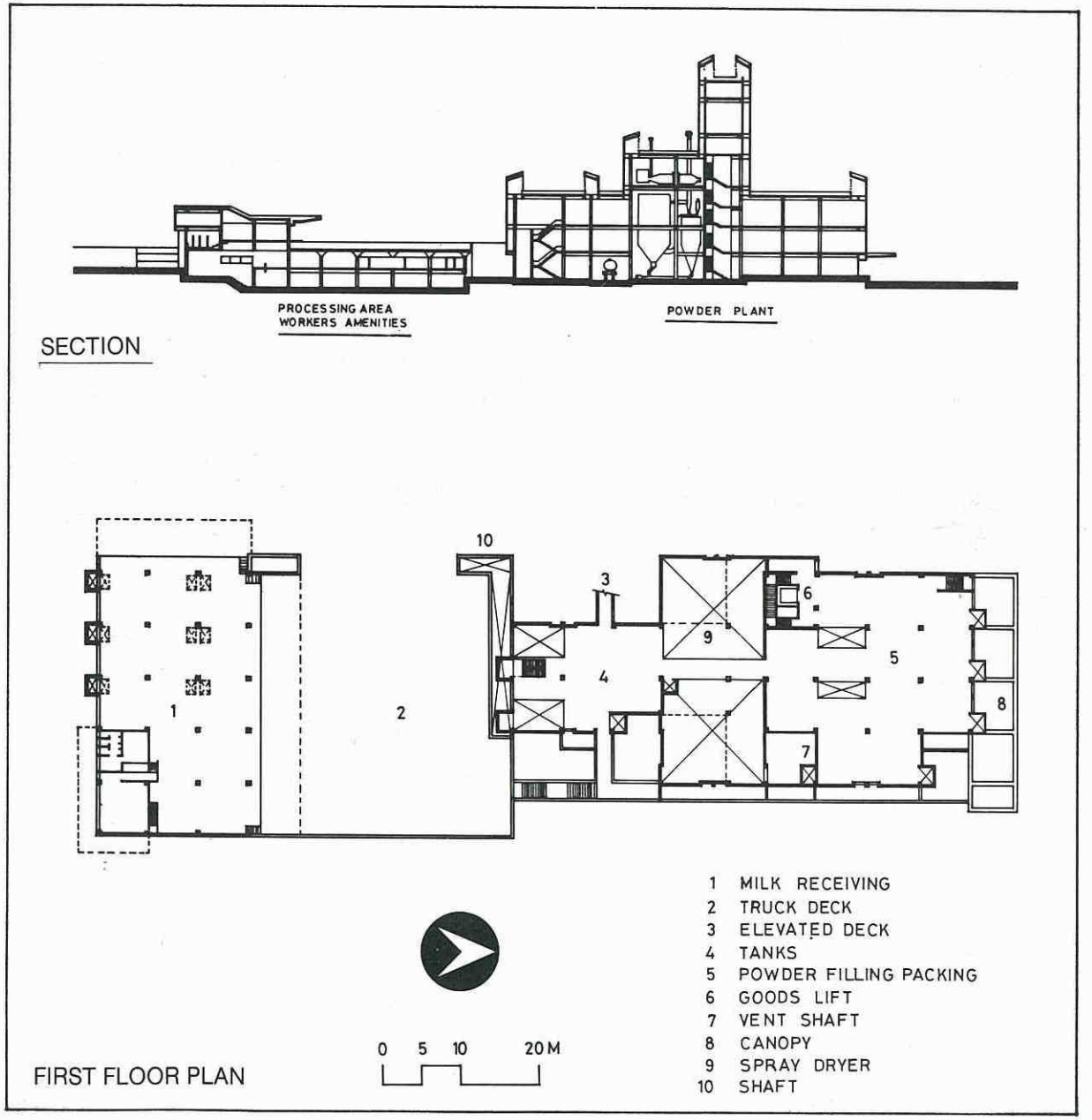
# MILK PROCESSING PLANT, MEHSANA (1971-74)

*Architect:* Achyut Kanvinde, New Delhi.

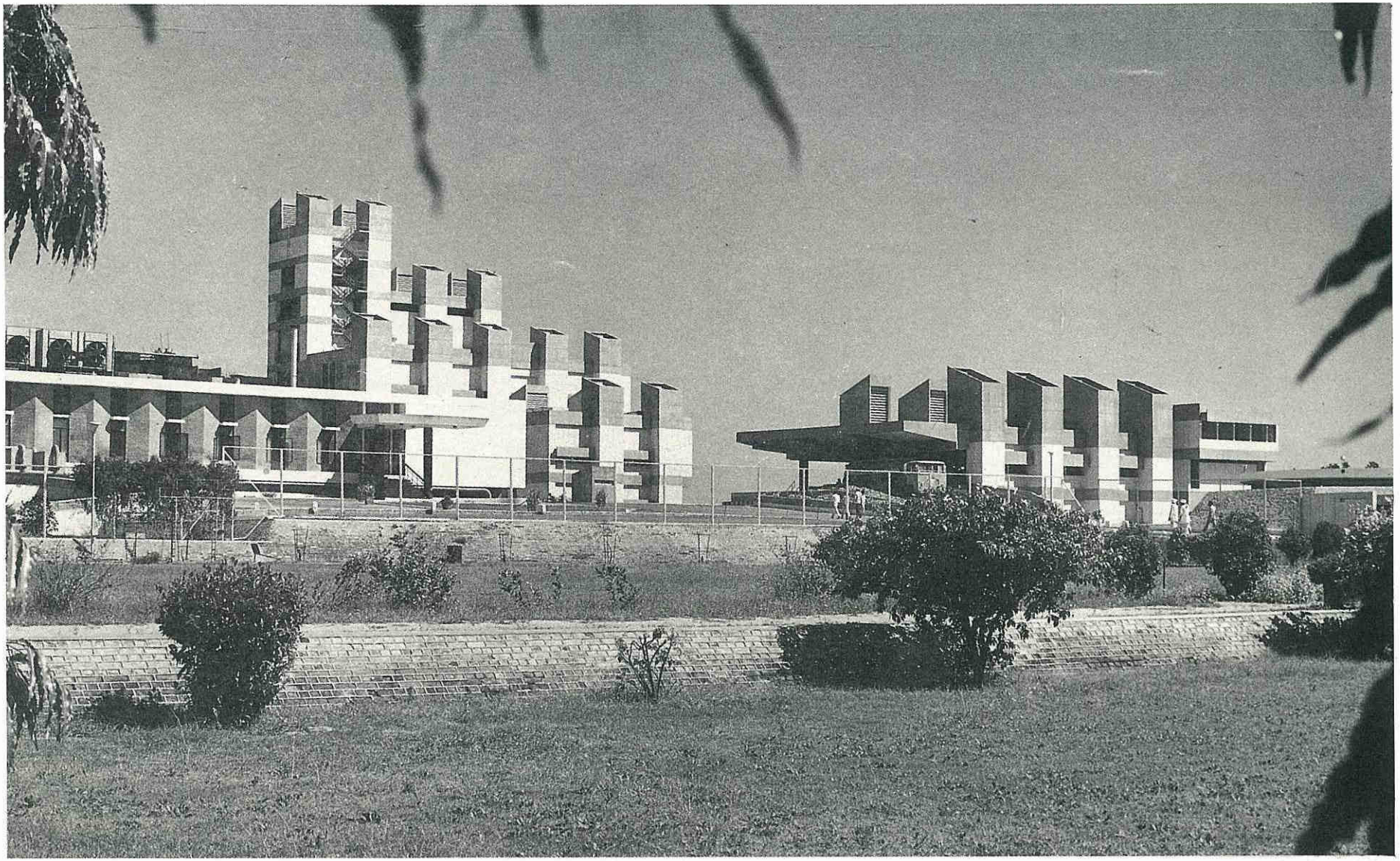
The Milk Processing Plant at Mehsana in Gujarat State is planned as an addition to an existing dairy complex. It consists of milk-receiving, processing, condensing and powder-making facilities. The concept is broadly based on effective ventilation and segregation of human and material movements. The natural slope of the site is fully exploited to distribute milk, using a gravity-feed system and thereby minimising the use of pumps and electricity. The milk-receiving areas are located at a higher level and milk tankers can ply on the roof above the processing block. Milk flows by gravity to the second level, where it is processed. The facilities for workers are laid out at the lowest level.

The need to dissipate heat in the powder-making areas has been met by the introduction of a system of ventilation shafts in a way that hot air is removed at the roof level through air convection currents, allowing fresh air to enter at the floor level. The system also saves energy costs. The structural, mechanical and the ventilation systems are so evolved as to become integral parts of a cohesive design form. The services associated with the plant such as electricity, airconditioning and milk silos are so positioned as to serve effective working needs.

The building is in reinforced-concrete frame with column-spacing of 7 metres. All the external concrete beams in the form of horizontal bands are left exposed and the brick in-fill walls are finished in sand-faced plaster. The internal flooring is mostly of Kota stone, except in the laboratories where Mandana stone has been used to meet acid-resisting needs.



Aesthetically built plant for transformation of milk to milk powder



## UNIVERSITY AUDITORIUM, TIRUPATI (1971-75)

*Architect:* S.L. Chitale & Son, Madras.

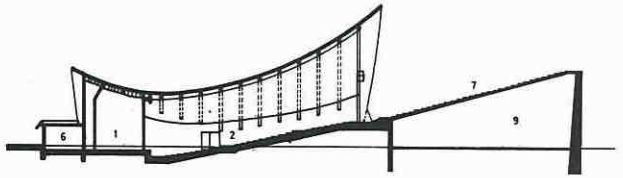
The auditorium constructed on the Sri Venkateswara University campus at Tirupati in Andhra Pradesh is a unique reinforced-concrete structure.

It has been conceived in perfect harmony with the Tirumala Hills in the background. The building, which can be adapted to hold convocations, conferences, public gatherings and concerts, has an internal seating capacity for 1,400 persons and an open-air gallery for another 500 persons. The design provides for extending the gallery to seat another 2,500 persons, beneath which would be housed an indoor recreation hall, stores and rooms for equipment.

The large stage has a system of screens for stage setting and rapid changes required during the performance of plays. Behind the stage are green rooms with attached toilets and a big store. Concealed control rooms are located on either side of the stage. Two semi-detached and low-height blocks on either side of the auditorium accommodate entrance foyers with furniture for sitting, ticket counters and toilets.

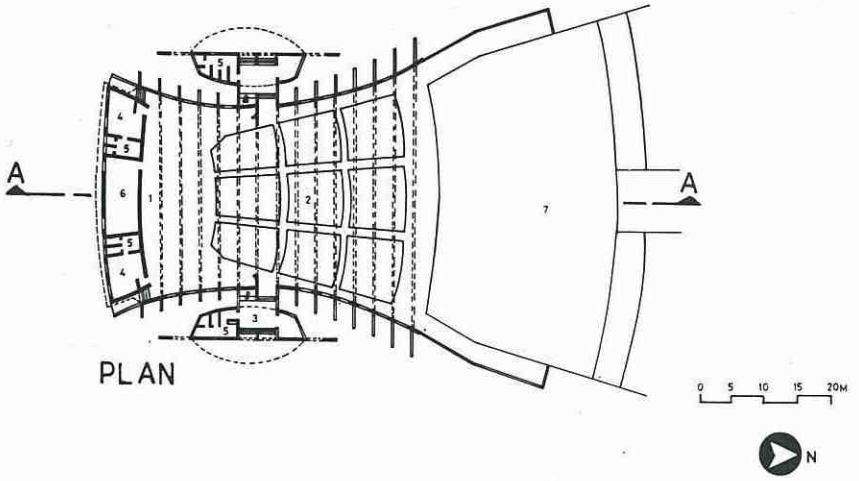
The structure is hyperbolic paraboloid in shape with a shell thickness of 10 centimetres. The shell, saddle-shaped longitudinally and parabolic in cross-section, is stiffened by arched ribs at 3-metre intervals. The ribs are interconnected at the crown level by a longitudinal beam.

The shell has been constructed in five different parts. The construction was carried out by starting from the rear end and proceeding towards the front. Each part of the shell was cast separately and joined to its adjacent part only after the form-work of both parts was removed. The form-work required for filling the gap with concrete was supported on the neighbouring ribs.



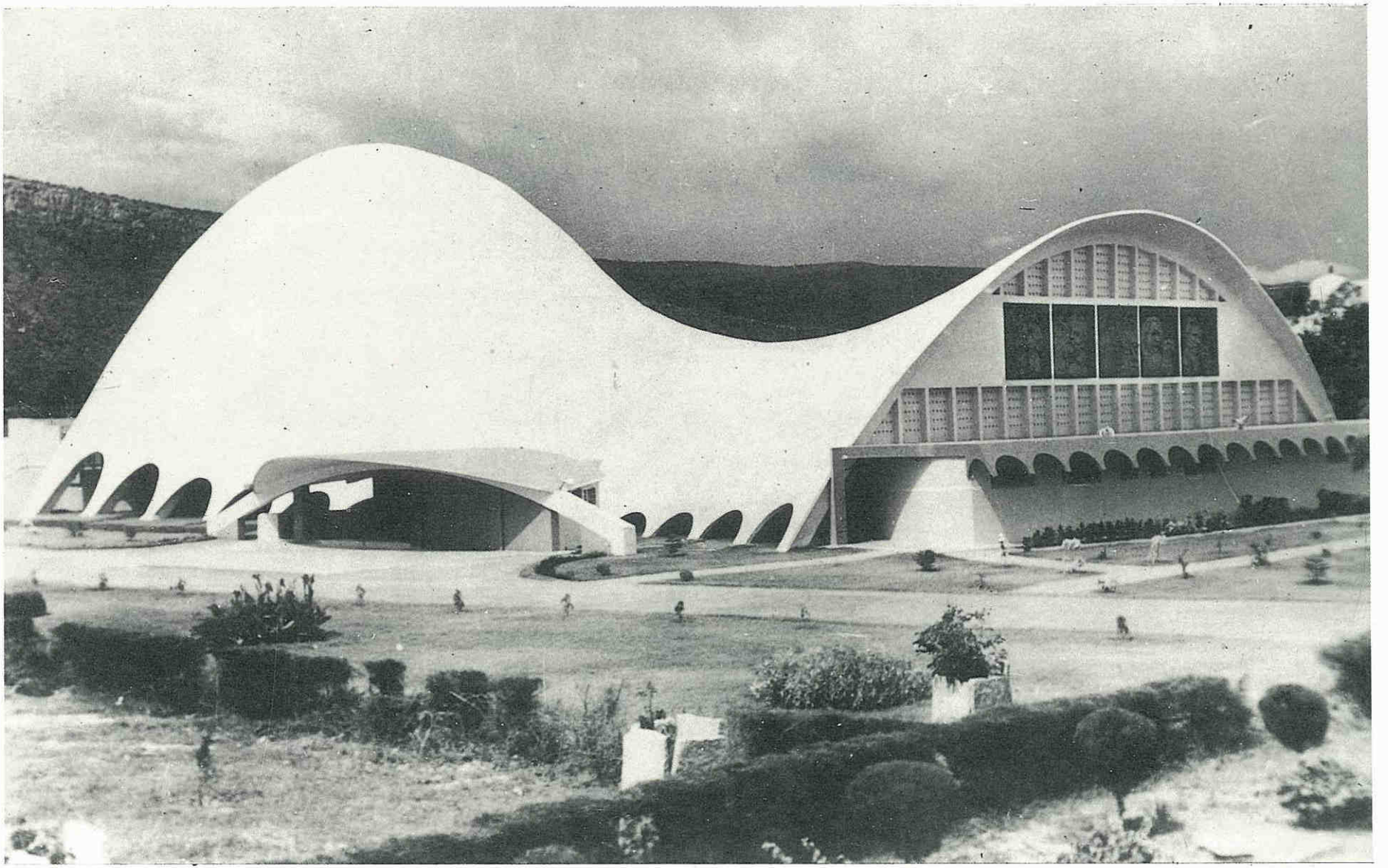
SECTION

1 STAGE
2 SEATING
3 ENTRANCE FOYER
4 GREEN ROOMS
5 TOILETS
6 STORE
7 OPEN AIR GALLERY
8 TICKET COUNTER
9 FUTURE RECREATIONAL HALL & STORE.




PLAN

Hyperbolic structure provides a hilly perspective.



## MATRIMANDIR, AUROVILLE (1971-92)

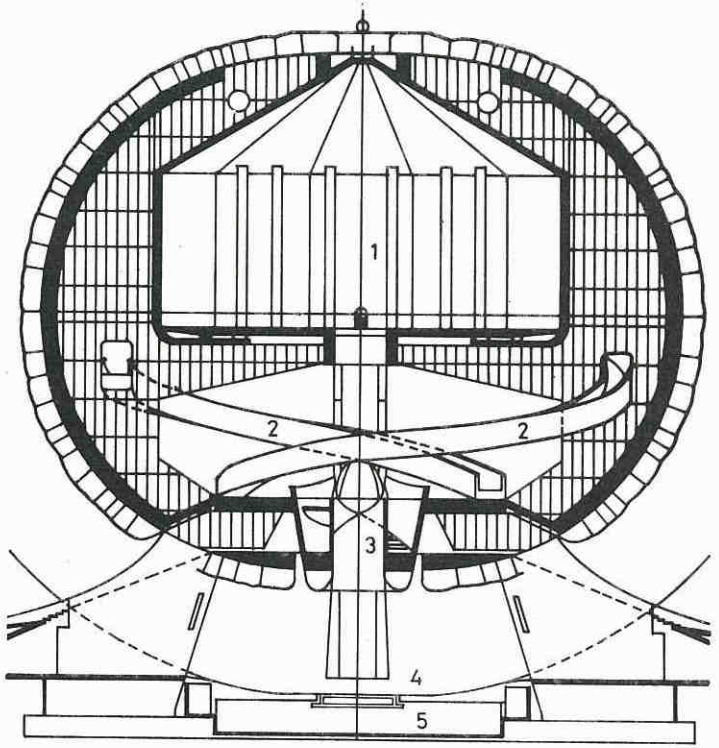
*Architect:* Roger Anger, Le Crestet.

Matrimandir—literally, "the dwelling place of the Mother"—is situated in the heart of Auroville, about 12 kilometres from Pondicherry.

The Mother of Sri Aurobindo Ashram conceived this temple and communicated her thoughts to the architect who translated it into a design. The scheme, which covers an area of 8.8 hectares, comprises the main temple, an amphitheatre and gardens. The temple consists of a meditation chamber which is enveloped by a flattened sphere. The form of the structure symbolically represents a cosmic egg. The chamber is located in the upper hemisphere with its floor positioned at the widest point of the shell. As in a Hindu temple, a processional path runs all around the spacious chamber. The chamber is dodecagonal in plan and has a conical roof. Its walls are clad with white marble and the floor is covered with white carpet. A pair of spiral steel ramps provides access to the chamber.

A crystal globe has been placed at the centre of the chamber as the focal point of attention, and a heliostat has been designed to direct the sun rays onto this globe. This is the only illumination for the chamber. The heliostat has a mirror which rotates in consonance with the movement of the earth so that the sun light is reflected constantly at the same angle. When the sun is not shining, artificial lighting is used to simulate the effect of natural light.

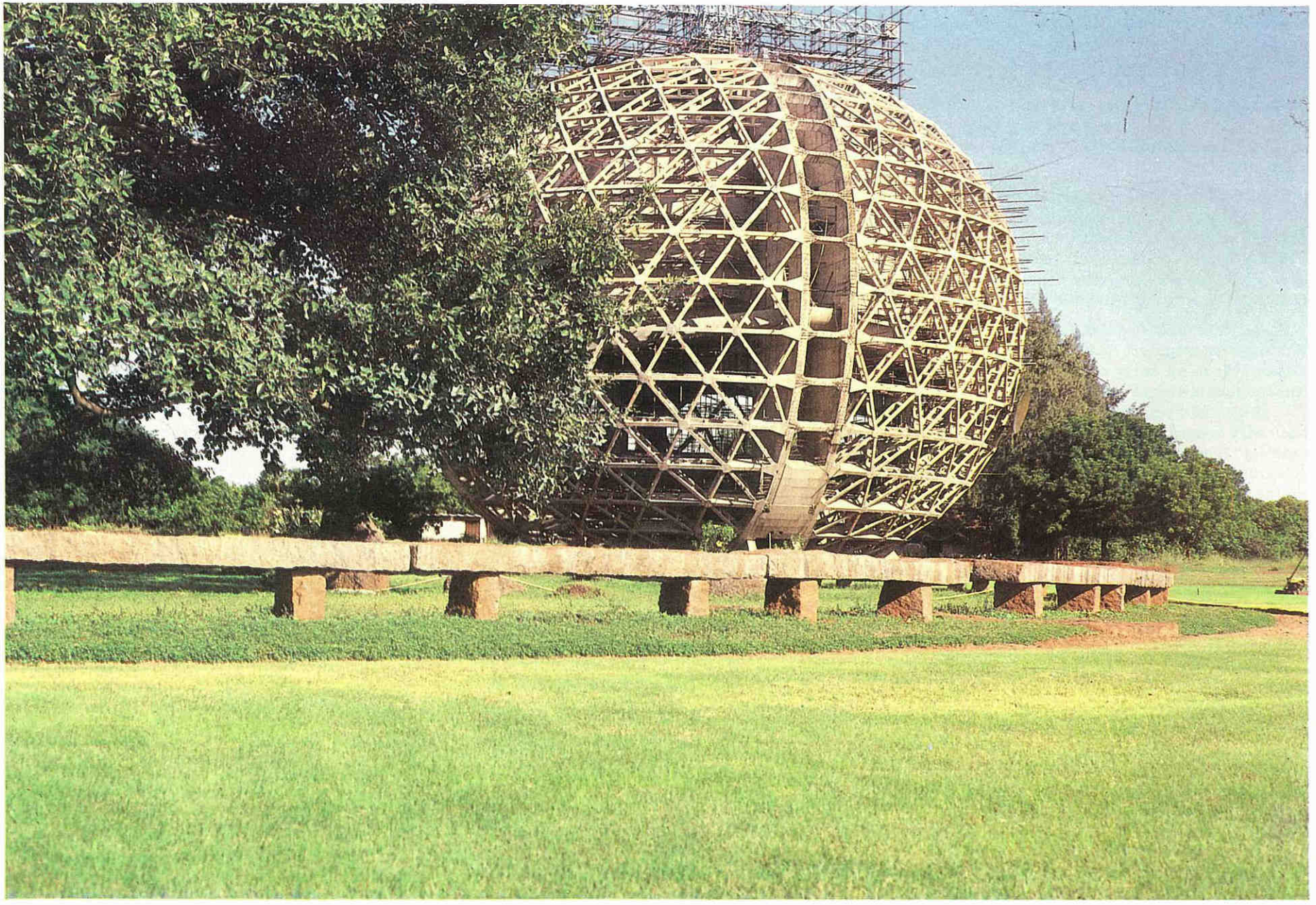
The superstructure is supported by four pairs of 38-metre-long sickle-shaped piers which are the principal load-bearing components. These piers were named by the Mother as Mahakali, Maheshwari, Mahalakshmi and Mahasaraswati, symbolising strength, wisdom, harmony and perfection respectively.




1 MEDITATION CHAMBER
2 RAMP
3 SPIRAL STAIRCASE
4 WATER TANK
5 RAIN-WATER STORAGE

0 3 6 9 M.

SECTION



## MADURA CLUB, MADURAI (1974)

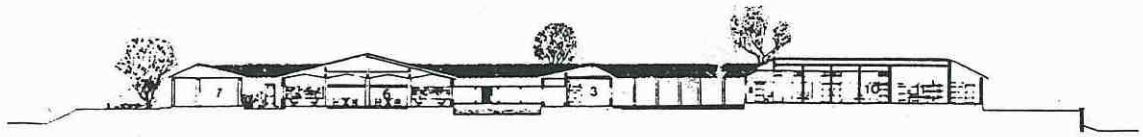
*Architect:* Geoffrey Bawa, Colombo.

When the premises of the old Madura Club were acquired, the management purchased a new site in a quiet corner of the residential area in the Madura Coats Kochadai compound in Madurai, a temple city in Tamil Nadu. The sprawling site which is shaded by huge trees, overlooks distant hills and presents a vista of rice fields.

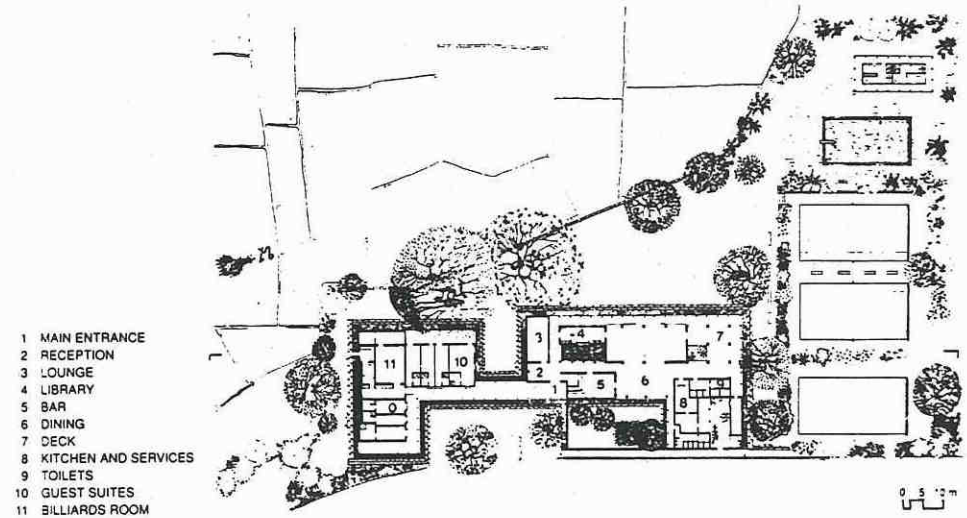
The low-lying structure of the new club was conceived as a series of spaces encompassing nature to blend perfectly with its locale. Preserving the decades-old banyan trees and accommodating them in the plan comprised the main theme on which the club was designed.

To achieve clarity in function, the building has been segregated in two distinct zones on either side of an entry court and the zones are interconnected by an open colonnaded walkway. The guest rooms have been kept on one side of the entry court to ensure privacy. On the other side is the main club which comprises a reception, lounge, library, bar, dining room, kitchen and a deck facing the playing courts and a swimming pool. Antique roof-hanging lamps in a row lend a certain charm to the colonnaded galleries. Although the plan looks simple, the well-maintained relationship between enclosed, semi-enclosed and open spaces provides a variety in experience.

To give an organic character to the building, traditional materials with their natural colours, shades and textures have been used in the contemporary idiom with exceptional skill and simple methods. Granite stone is extensively used in the building, utilising ancient techniques of splitting this stone. The 3.65-metre-high rough-hewn stone columns and beams support timber rafters and a purlin network with flat and curved clay tiles above. The ceilings are lined with hand-woven cotton. The hardware for windows and doors is hand-cast in bronze. The architect's idea of reusing a few carved 18th century columns and antique doors, brought from old demolished houses, in the internal rooms has given the building a distinctive character. The footpaths are paved with granite stone slabs as large as 3 by 1.5 metres each and edged with pebbles and stone slabs, thus creating a continuity between outdoor and indoor spaces. As a result of using local materials and techniques, the club building has become very much a part of the land to which it belongs.



SECTION




GROUND FLOOR PLAN

Stone plasticised

No cultural shock to nature lovers

Inner truth of materials

## PRESS ENCLAVE, NEW DELHI (1974-78)

*Architect:* M.N. Ashish Ganju, New Delhi.

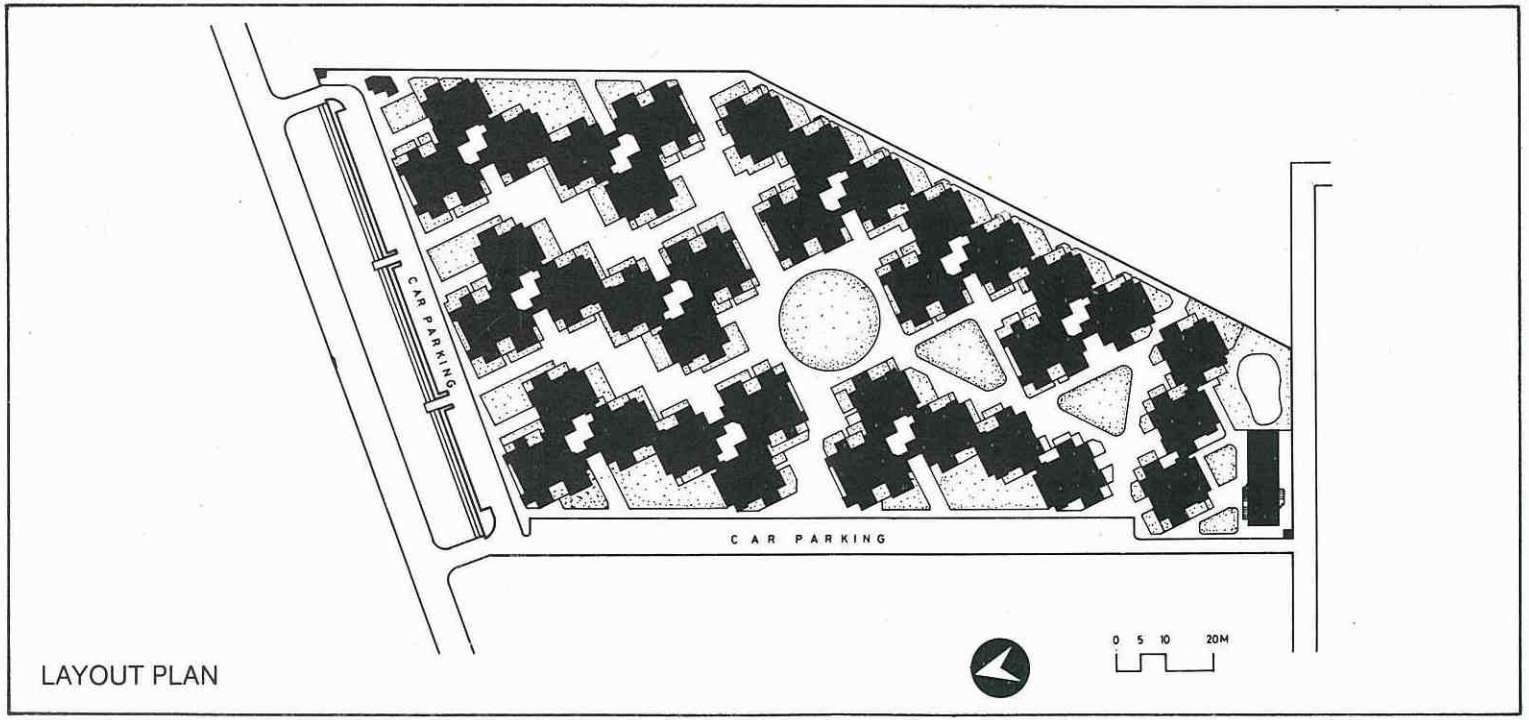
The Press Enclave in Saket, a southern suburb of New Delhi, is a cooperative group housing scheme for journalists and is located on a 1.7-hectare site. The scheme comprises 180 dwelling units with a density of 106 units per hectare.

Keeping in view the economic background of the members of the cooperative society, three basic categories of houses, each respectively having a plinth area of 120, 100 and 75 square metres, were evolved. To offer wider choice to the members, different designs were conceived for each category. These were combined in each housing block, rather than having each type segregated into its own block.

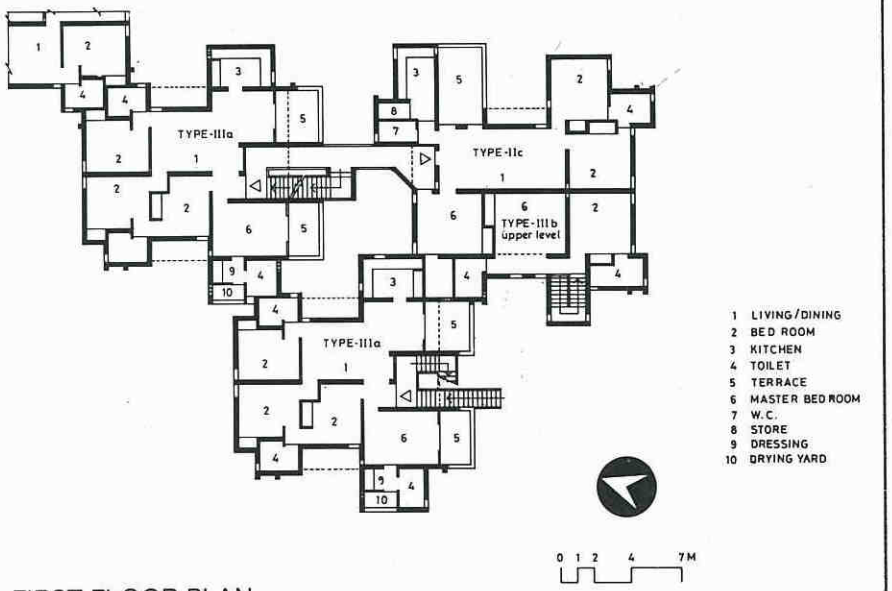
In this complex, a combination of five houses forms a module, three-and-a-half storeys high. The smaller units are kept on the ground floor of the blocks and are provided with enclosed courts to accommodate the inevitable spill-over. The upper two floors are combined to make duplex flats, so that the main staircases climb only two floors to provide access to all units. Vertical clustering of units affords outdoor terraces to each house by the reduction of the covered areas on the upper floors.

In response to climate, the blocks are oriented with fenestration largely on the north and the south, while openings to the east and the west are minimal and protected by modulations in plan. The spatial structure of the neighbourhood is based on the concept of clustering to form streets and courts of varying scales so as to facilitate a hierarchical disposition of spaces. Streets and courts thus evolve into a circulation system wherein vehicles are restricted to the outer limits of the complex, while the pedestrian inner precinct only allows emergency vehicular access.

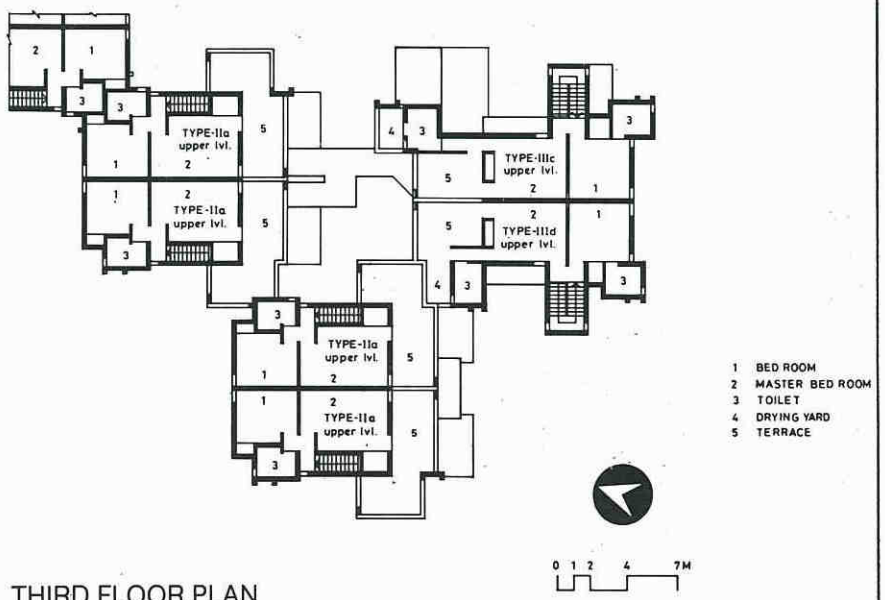
The streets and entrance courts are paved in concrete while flower-beds along the buildings aid in softening the streetscape. The structural system comprises load-bearing brick masonry walls with reinforced-concrete slabs for the floors and roofs. The service areas are stacked vertically to promote efficiency and economy in plumbing.



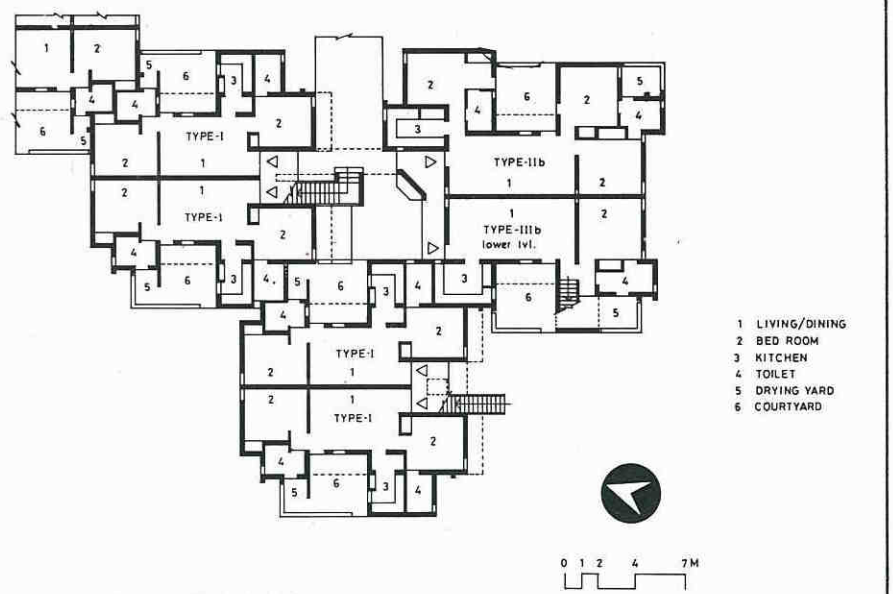

LAYOUT PLAN



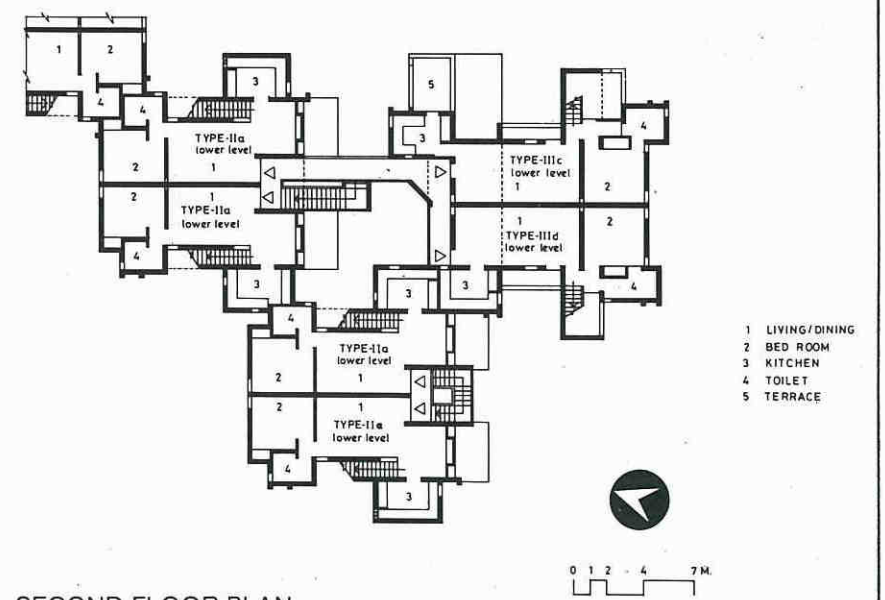

FIRST FLOOR PLAN




THIRD FLOOR PLAN




GROUND FLOOR PLAN




SECOND FLOOR PLAN

Coming out to delightful spaces

Fabricating mirthful spaces

Breaking urban monotony: Architectural engineering

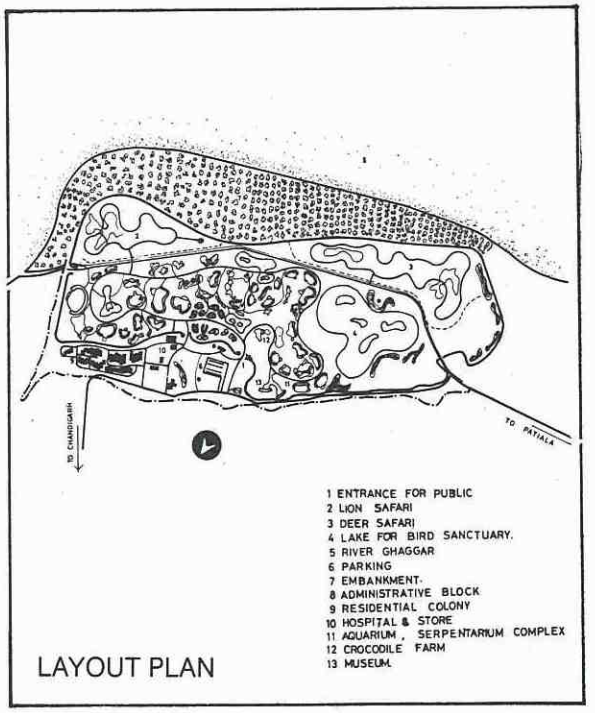
# M.C. ZOOLOGICAL PARK, CHHATBIR, DISTRICT PATIALA (1974-80)

*Architects:* Jeet Malhotra and D.K. Behl, Department of Architecture, Punjab.

The unique Chhatbir Zoological Park is located on the banks of the Ghaggar River, 20 km from Chandigarh on the Patiala-Chandigarh road in Punjab. This undulating forest land of 200 hectares is protected against flooding by an embankment on three sides and a flood drain on the fourth.

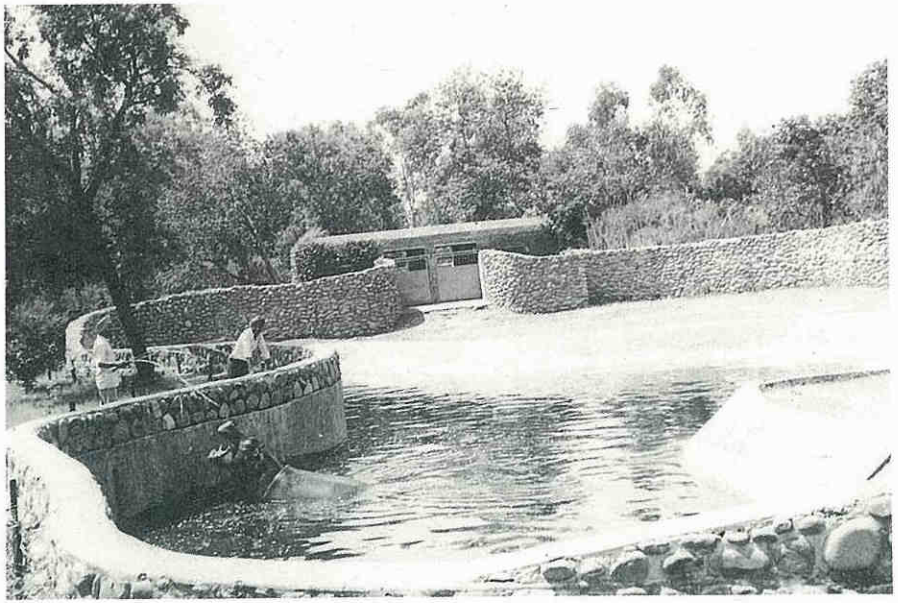
Meandering paths gradually open up the various vistas, at the same time providing a sense of direction to the visitors. The animal enclosures are designed to suit specific liking of different species. Their design also enables the animals and human beings to see each other without obstructing vision. The enclosures are dispersed so as to create a variety of spaces and are grouped to facilitate feeding and other managerial requirements.

The existing low-lying ditch on the north-west side has been converted into a shallow lake covering about 8 hectares, which attracts birds in large numbers, especially migratory birds in winter. A unique lion safari spread over eight hectares allows free movement of lions, and visitors are taken around in caged vehicles. A physically segregated deer safari covers an area of 12 hectares. To harmonise built-forms with the natural landscape, all buildings like the aquarium, the serpent caves, the crocodile farm, the museum, etc. have been kept single-storeyed.

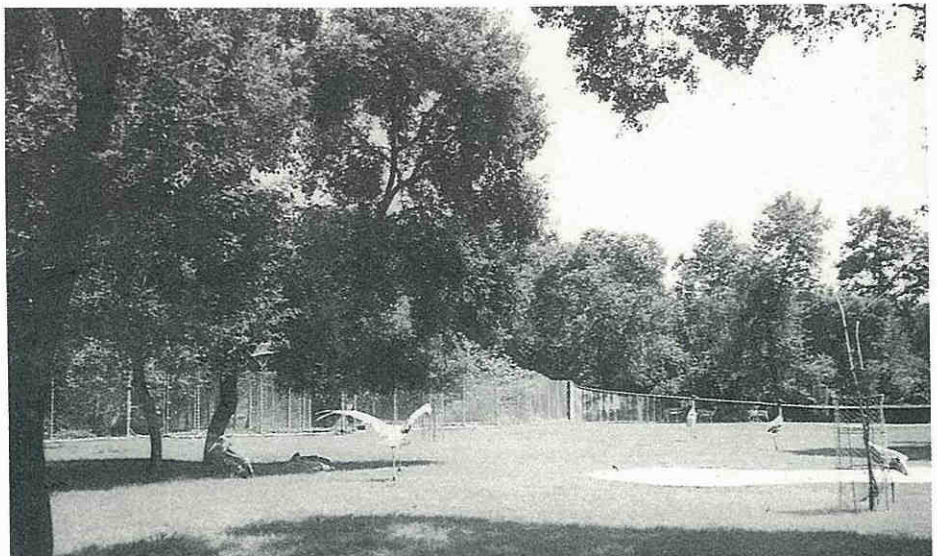


LAYOUT PLAN

Hippopotamic architecture

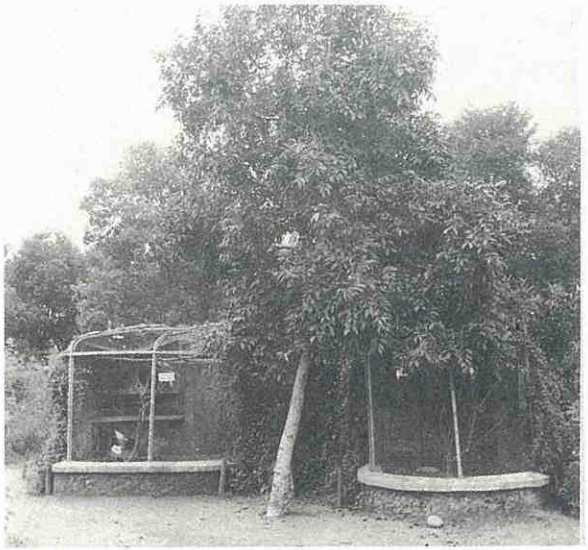


Illusion of jungle: Home, away from home



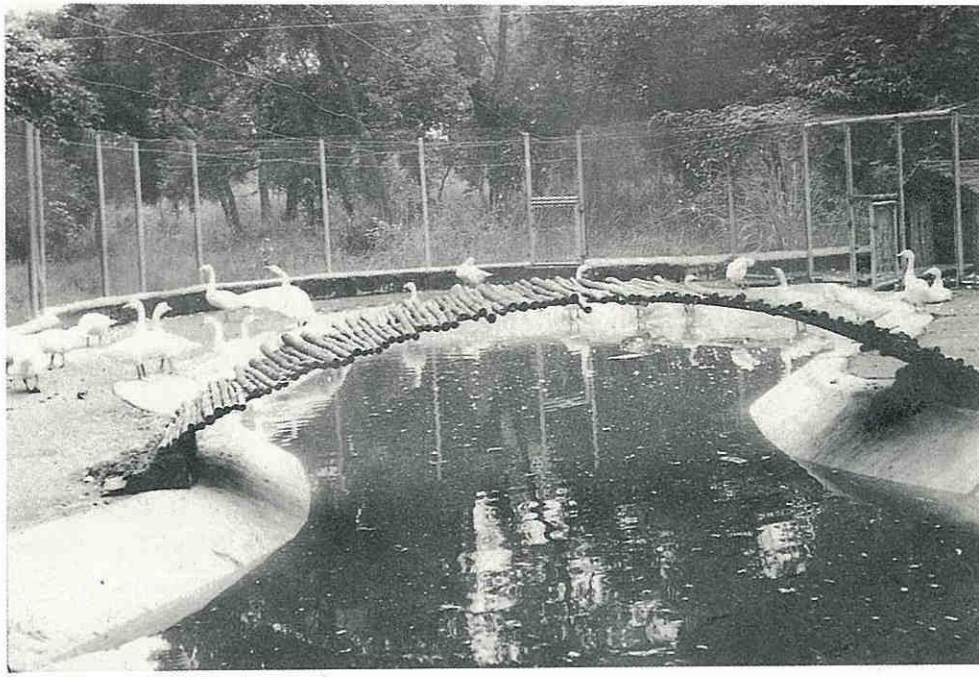
Children's Park: An introduction to animals

A bird's eye view



Walk paths to the animal enclosures

Rivulet runs to please the animals



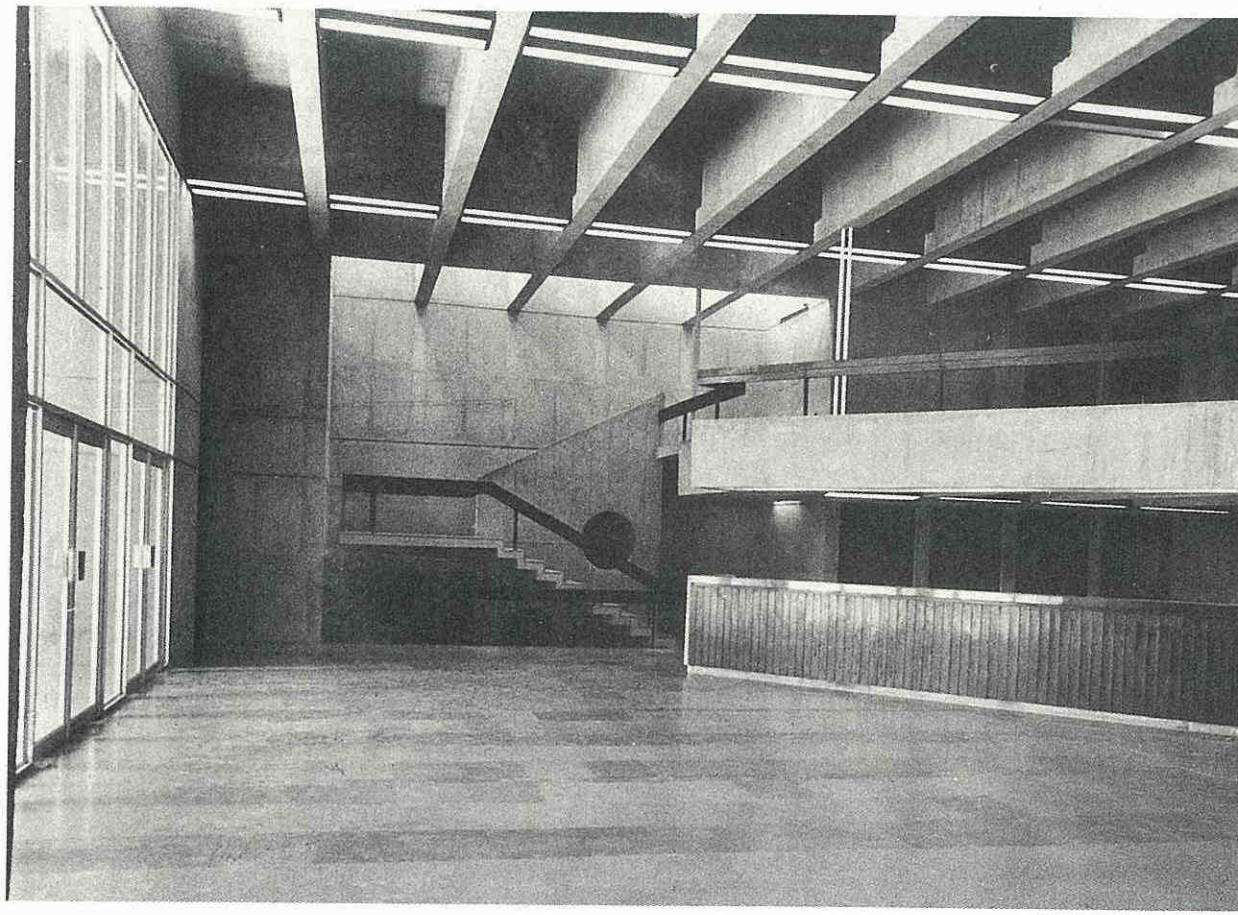
## DENA BANK, AHMEDABAD (1974-82)

*Architect:* Hasmukh C. Patel, Ahmedabad.

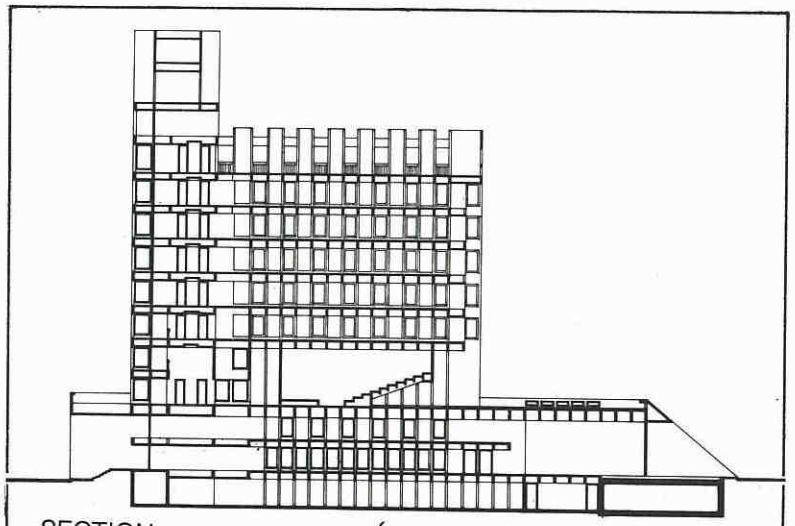
The multi-storeyed regional office building of Dena Bank in Ahmedabad is located on a long and narrow 1-hectare plot on the busy Ashram Road. It has a total built-up area of 6,800 square metres.

The impressive built-form is characterised by a tower block sitting on a two-storeyed podium. The six-storeyed tower block houses the administrative offices of the bank, while the ground floor together with a suspended mezzanine floor is meant for banking facilities. A meticulously paved plaza in the front provides direct access to the public areas. A grand flight of steps sandwiched between slanting buttressed walls leads to the podium level, from where the receded office block and an auditorium for 150 persons at its base are accessible. Entry for the staff is from a landscaped rear court. The towering service block is also placed at the back for the convenience of employees.

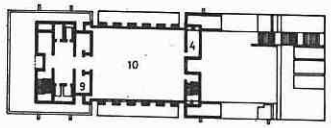
The design is based on a basic module of 1.5 by 15 metres, which allows unobstructed usable spaces of 15 metres width on all the floors. To avoid the necessity for false ceilings, the air-conditioning and lighting are located in exposed ducts along cutouts in the beams. The arrangement ensures a truthful visual expression of all structural elements. Fenestration in office spaces on the north and south facades is deeply recessed. The east and west facades are predominantly blank, but are enlivened by judiciously set recessions. The entire building is in reinforced concrete with smooth finished surfaces left exposed.



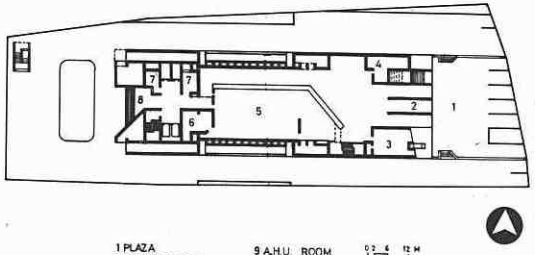
Truth of interior anatomy



SECTION

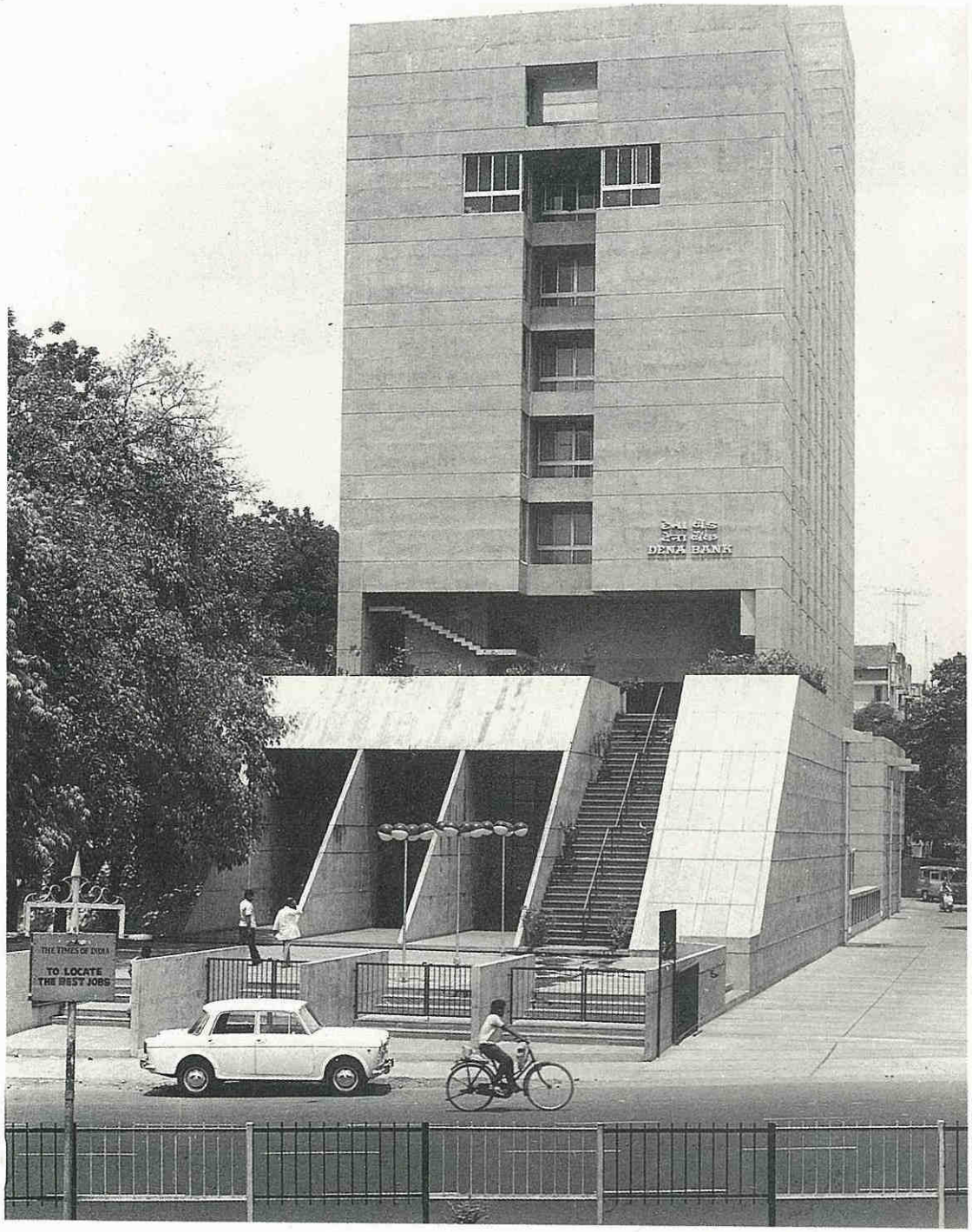



TYPICAL FLOOR PLAN




1 PLAZA
2 PUBLIC ENTRY
3 AGENT ROOM
4 STORE
5 BANKING HALL
6 STRONG ROOM
7 TOILET
8 STAFF ENTRY
9 A.H.U. ROOM
10 OFFICE SPACE

GROUND FLOOR PLAN




Profoundness of design

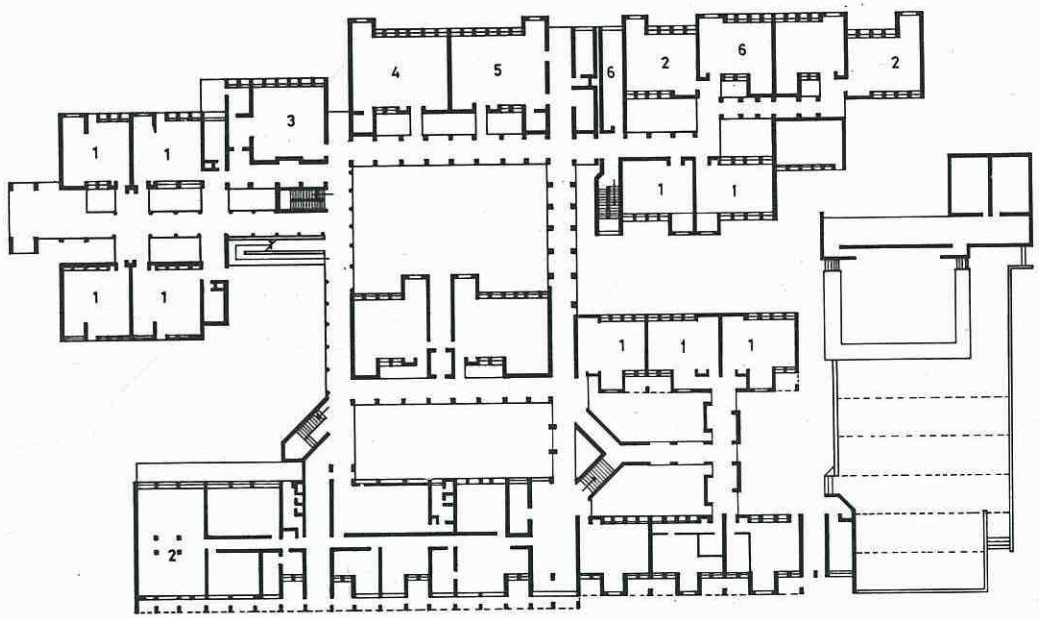
## MODERN SCHOOL, NEW DELHI (1974-89)

*Architect:* Sachdev Eggleston Associates, New Delhi.

Modern School is located on a 2.2-hectare site in the Vasant Vihar area of New Delhi. The site is predominantly flat, but it has a natural rock outcrop to the west. The planning laid emphasis not only on the academic aspects but also on sports, arts and crafts, music, dance, drama and practical work in radio, electronics, home science, etc. The complex has a total built-up area of 14,000 square metres and is designed to cater to the nursery class and 12 standards. It comprises classrooms, laboratories, activity rooms, libraries, administrative offices and a canteen, besides playfields.

Keeping in view the fact that the school went in for phased development, the plan is divided into a number of blocks grouped around courtyards. This makes each block not only independent, but also leaves open the possibility of joining it naturally with the next constructed block. A 2-metre-wide corridor which is detached from the classrooms links these blocks. This formation helps in ensuring good cross-ventilation and natural light, besides cutting down penetration of noise into the rooms. On the ground floor, the large areas thus created in between the blocks help in promoting interaction between the students and the teachers.

The buildings are so oriented that all rooms have fenestration to the north and south. The windows, being deep-recessed, are well protected from the sun and rain. To enhance external expression, certain architectural elements like circular openings and brick arches are repeated all over the facades. The classrooms are so designed as to be used as "subject classrooms" in future, enabling the teacher to use the visual aids required to create an environment relevant to the subject.




GROUND FLOOR PLAN

A natural rocky mound has been incorporated in the landscape to exploit its full potential. The primary school wing is placed at one end so that small children can have the advantage of climbing and playing on the rocks. Shrubs, grass and flowers are planted between the rocks. The play equipment placed near it adds to the environment. The buildings are three-storeyed composite structures with reinforced-concrete frames and load-bearing brick walls which are left exposed on the external sides.

Sunlit openings to series of courtyards

Onto inner vistas: Steps and circular openings

The Kahn-ian effect?

Architecture for junior school

## ROCK GARDEN, CHANDIGARH (1974-1990)

*Architect:* Nek Chand, Chandigarh.

The Rock Garden is situated on the banks of a seasonal rivulet on the north-east edge of Chandigarh.

Waste materials like broken bangles, fused bulbs and tube lamps, electric insulators, pebbles, broken china, bits of cloth and various other kinds of left-overs have been used in this garden.

The principle on which Nek Chand works is: "There is no waste material which cannot be turned into something beautiful." He seldom plans his designs on paper. He follows the concept in his mind. He beholds beauty in each particle of God's creation: "I see God in everything; I find stones, rocks, pottery, clay, metal and I want to make all that into something that will make others aware of Him. Thus all my work is Prayer."[14]

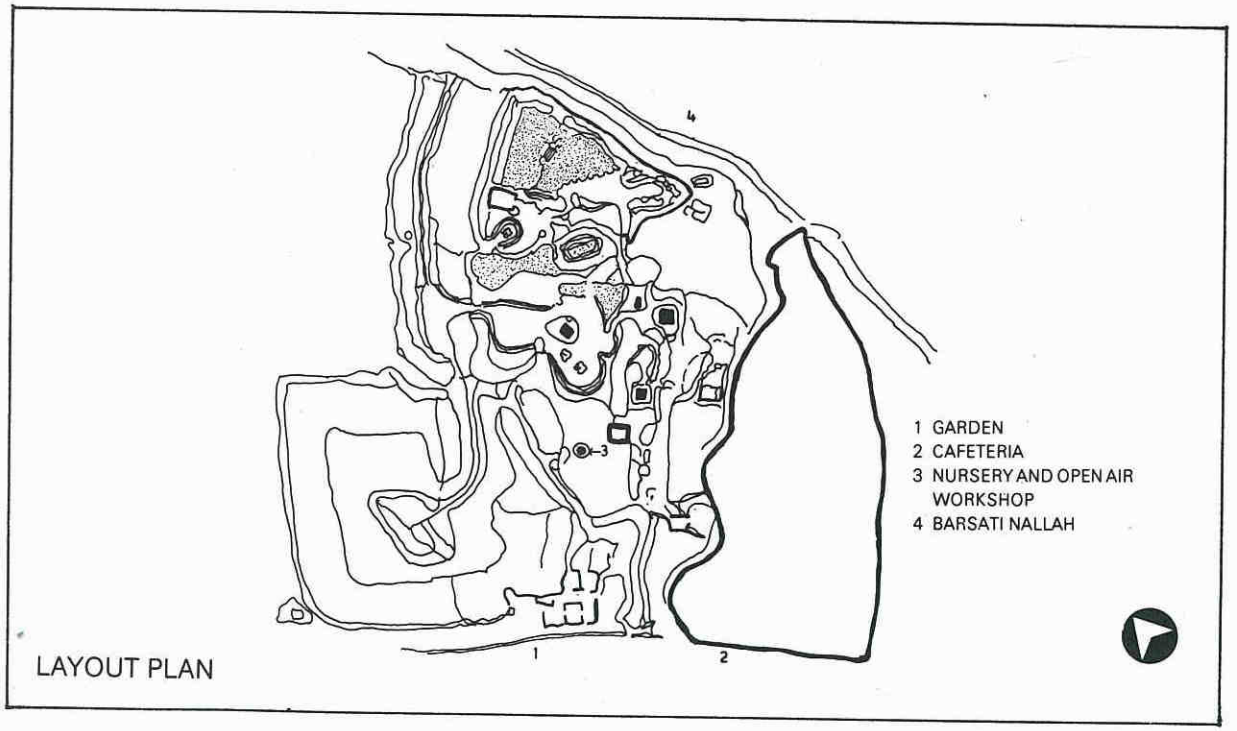
In a dream Nek Chand saw a king and a queen, their glory and the subsequent fall of their kingdom. Inspired, he decided to rebuild a beautiful kingdom in the memory of the king and queen and planned the Rock Garden on a similar mythological theme.

The garden has been planned without disturbing the existing topography, landscape and environment of the site. The main entry is through a low porch connected with a passage with embankments on both sides. Pieces of stones and rocks, evoking images of animals and humans, are displayed here. Beyond this is a panel fashioned out of porcelain electric insulators and a fence built entirely of earthen pots. A shallow pool enhances the beauty of this part of the garden. Then there is a hut on a lower level from where Nek Chand made a modest beginning of constructing the Rock Garden. Beyond the hut there is a valley which is accessible through a narrow passage flanked by artificial hillocks on both sides.

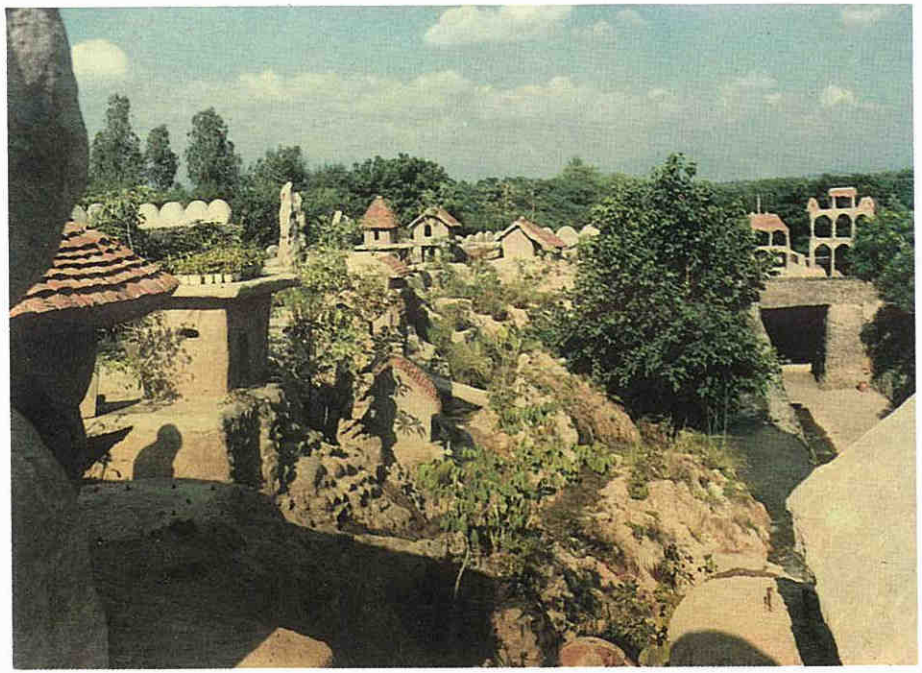
The valley contains an open-air theatre for 500 persons, waterfalls and exquisite sculptures. In this valley Nek Chand's art of sculpture finds expression in a superb fashion. An uprooted tree which once existed at this site has not only been preserved but has been transformed into a unique piece of sculpture. Sculptures of fossils are also on display. The railings, parapets, columns, waterfall and bridges in the valley have a unique artistic touch. Tar-drums have been used horizontally all along the passage to make a railing. To symbolise the traditional art of constructing bridges over rivers, another railing has been sculpted to appear as logs being carried by human beings.

Adjacent to the valley is a symbolic village which is accessible through a narrow path between man-made hillocks. It is located on the south-east of the garden and symbolises the dwelling place of an imaginary king's subjects. It includes a shrine. Some of the hillocks appear to be snow-capped; white cement has been used on them. An attempt has been made to create an authentic Indian village.

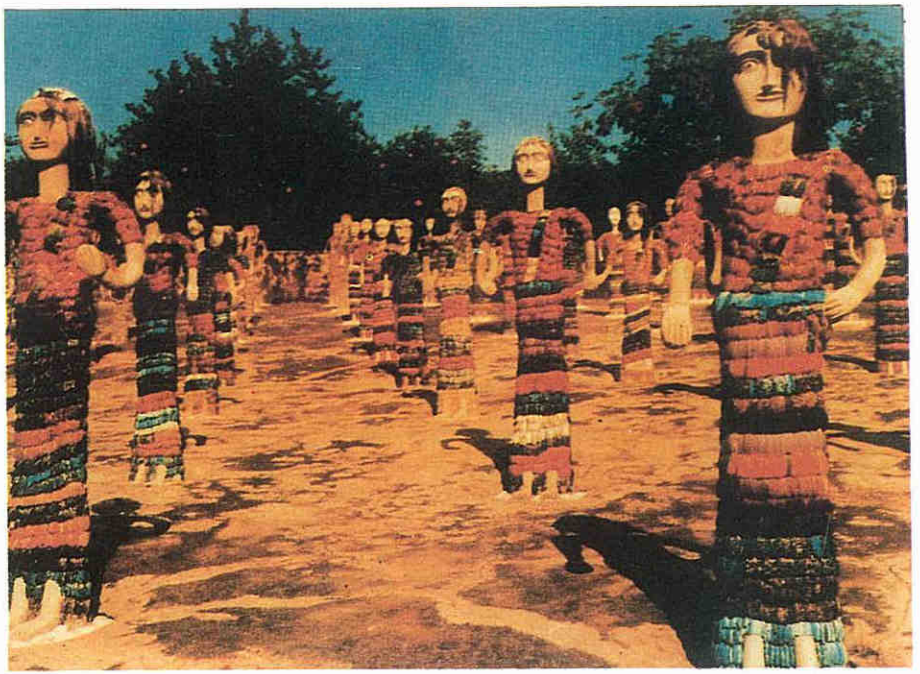
The King's *durbar* area has a variety of spaces. The skyline has small kiosks on the top with their roofs resembling a throne. Here two grassy terraces at different levels are linked together by a flight of steps. Two unusual sculptures set with pieces of porcelain flank the



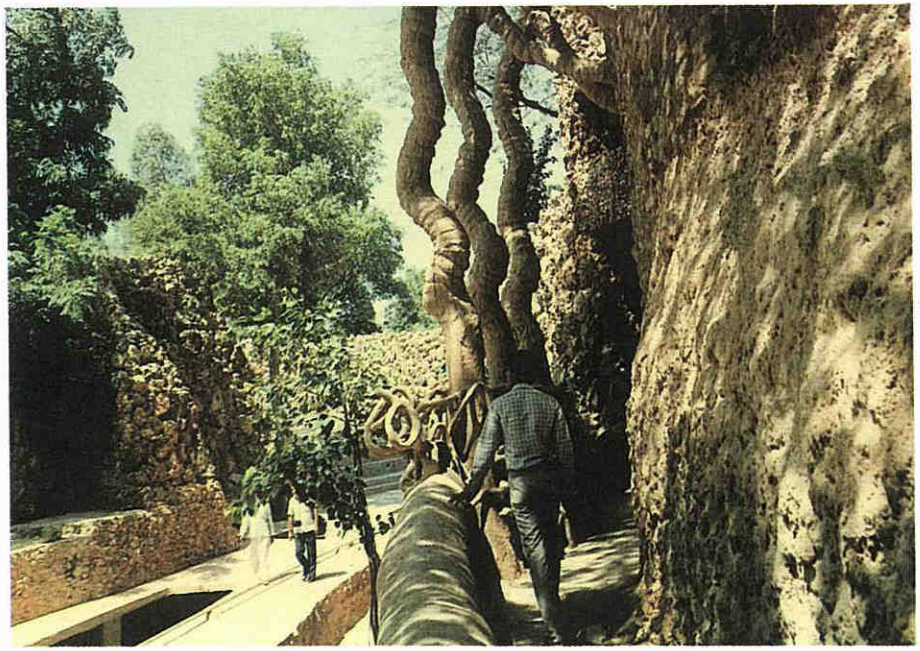
LAYOUT PLAN



A rural feel: Indianisation of art



Kings and queens with feet of clay



Even uprooted tree is grist to the mill of art

steps. The next scene is the queen's bath with a shallow pool in the centre.

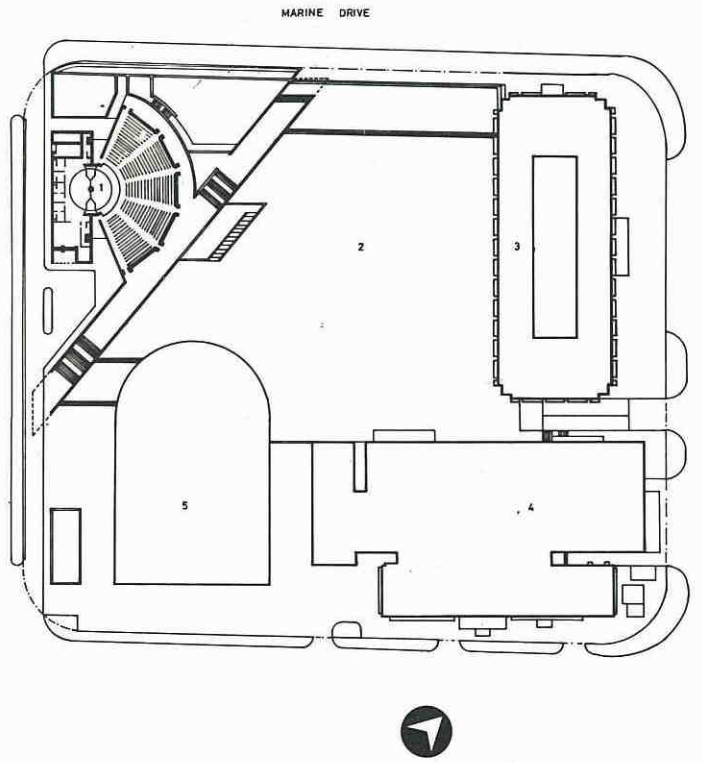
Then there are numerous chambers which are connected with each other by narrow passage-ways and a series of low arches. Each chamber has its own identity without losing its relation with the overall scheme. Thousands of sculptures are displayed in these chambers. There are bullocks, monkeys, peacocks, party scenes, soldiers and dancers and ordinary village folks. The trees and the shrubs have been carefully set so as to complement the contents of each chamber.

# NATIONAL CENTRE FOR PERFORMING ARTS, BOMBAY (1975-1980)

*Architects:* Philip Johnson and John Burgee, New York.

Bombay's National Centre for Performing Arts is situated on a 3.2-hectare site of reclaimed land at the edge of the bay on Marine Drive. It consists of primarily a 1,040-seat theatre. The master plan in its subsequent phases calls for an additional 2,000-seat concert hall, a 200-seat experimental theatre, a school, library, museum and a students' residence hall, besides an office tower.

The theatre is designed fan-shaped so as to keep the last row of seats close to the stage. This enables one to appreciate the subtle movements of the eyes and the facial expressions in, especially, classical Indian dancing and to participate visually in the performance. A revolving stage has been provided for change of sets in a drama performance. To avoid any drumming sound created by the feet in a dance performance, the stage is of a concrete slab, topped by a parquet. The theatre has been provided with two accesses, one from the Marine Drive and another from an internal road. Instead of the traditional rectangular foyer, one over 91 metres long, running diagonally across one corner of the plot, has been provided. Wide flights of steps at the ends of foyer lead the eye to the upper foyer with six entrance doors to the auditorium.

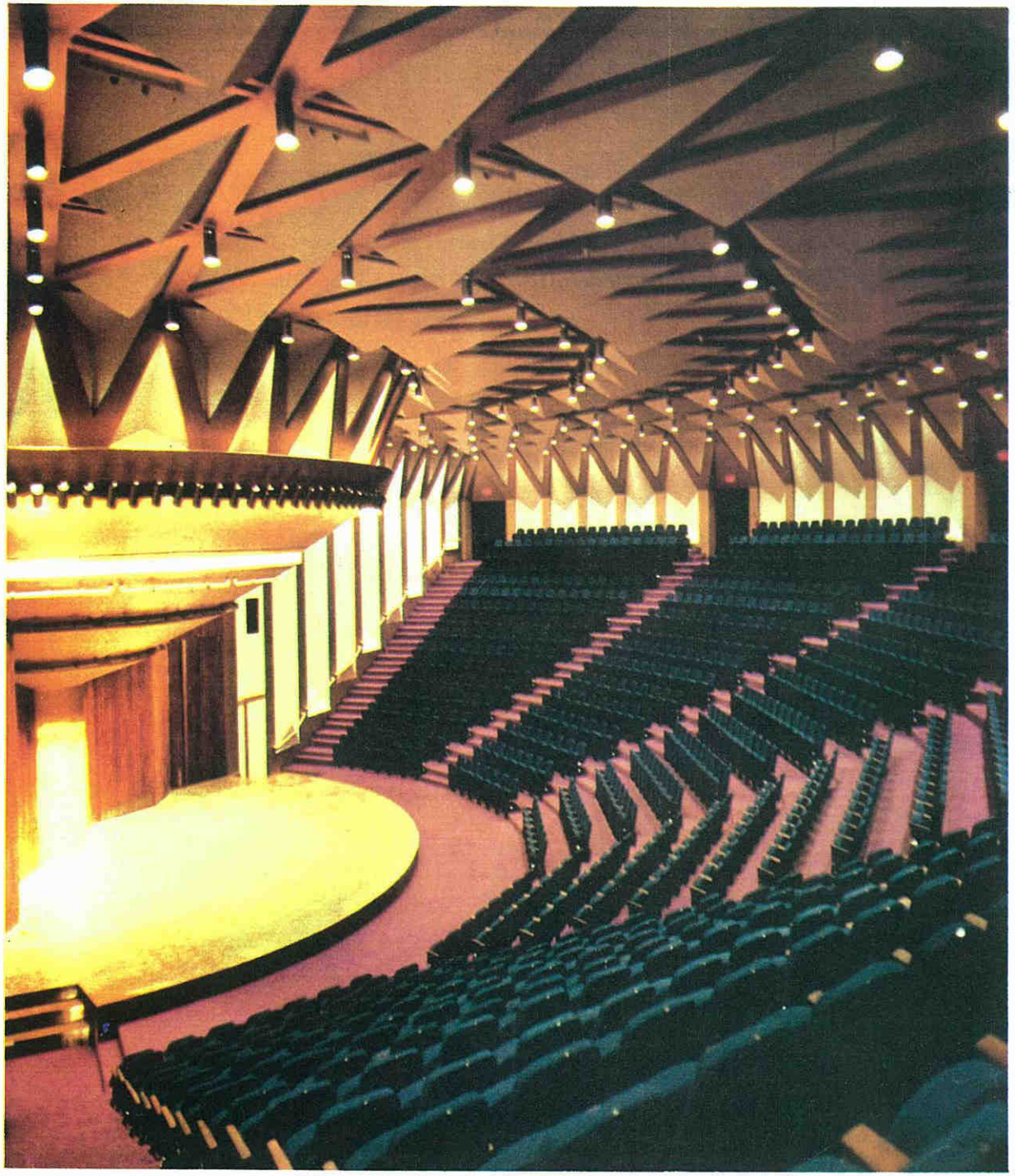



SITE PLAN

The interior of the auditorium has been designed specifically to meet the specific acoustic requirements of Indian classical and folk dances, drama and music. Indian instruments and voices are so soft and delicate in character that the music cannot be enjoyed in its purity when electronic amplification systems are applied. The theatre, which tides over this handicap, is of such acoustic properties as to do away with the customary reliance on artificial amplification. This has been achieved by means of specially designed elongated three-side forms, which, from their starting point at the centre of the stage, extend in concentric circles over the entire ceiling and also along the walls of the auditorium.

Several unique features have been incorporated to shut out all extraneous noises from the auditorium, for instance airconditioning ducts have been made several times larger than the normal size to prevent noise from the system; the plant room located in the basement has been structurally isolated from the theatre building; all piped services have been provided with flexible connections to prevent direct sound transmission; and independent pile foundations are provided for the auditorium to prevent external vibrations.

The theatre by the sea-side



Interior view of the auditorium

## CENTRAL INSTITUTE OF EDUCATIONAL TECHNOLOGY, NEW DELHI (1975-89)

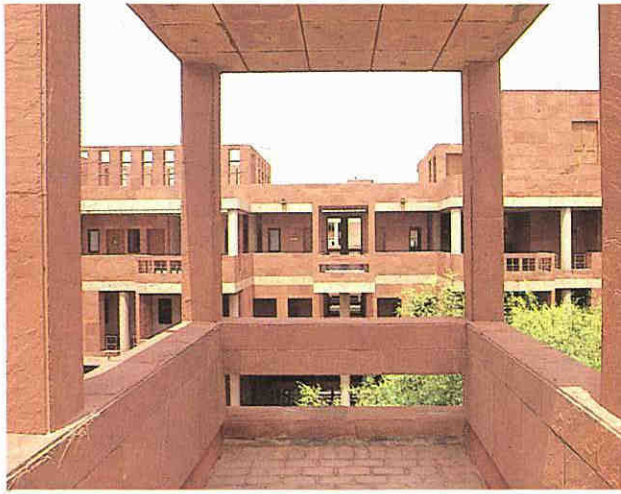
*Architect:* Raj Rewal Associates, New Delhi.

The campus of the Central Institute of Educational Technology forms part of a network of educational institutes in South Delhi and touches the national park surrounding the historic Qutab Minar.

The building has 10,500 square metres of covered area and comprises classrooms, administrative offices, sophisticated studios for sound and film recording, along with production rooms and ancillary facilities.

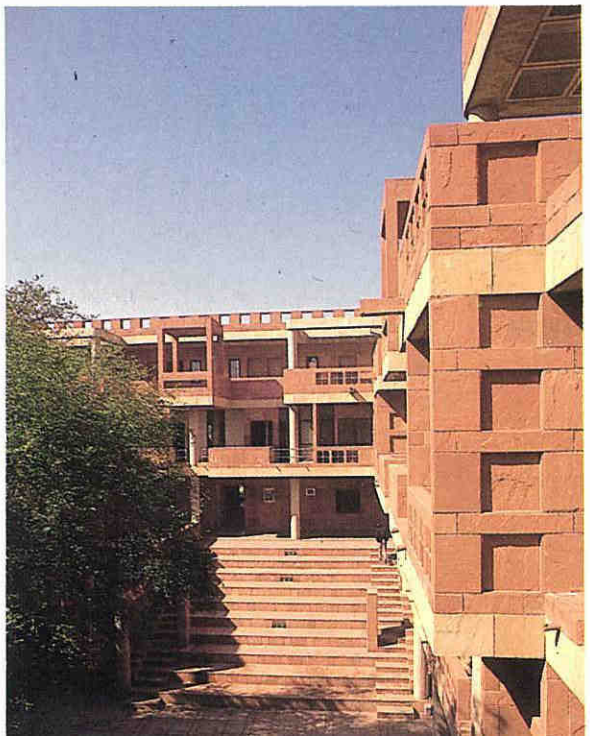
A small entrance forecourt is linked to a larger central court built around an extant tree. The bigger courtyard comprises an open-air stage and amphitheatre and is enclosed on the ground floor by an entrance hall, artistes' rooms and a canteen. The courtyard is, in fact, evocative of the *madrasa* (traditional school) concept. It is surrounded on the upper three levels by passages linking library, audio-visual and administrative activities. The upper floors have roof terraces overlooking the central courtyard and the surrounding park. These terraces serve as outdoor discussion fora and are interspersed with balconies which are used for filming the activities within the courtyard.

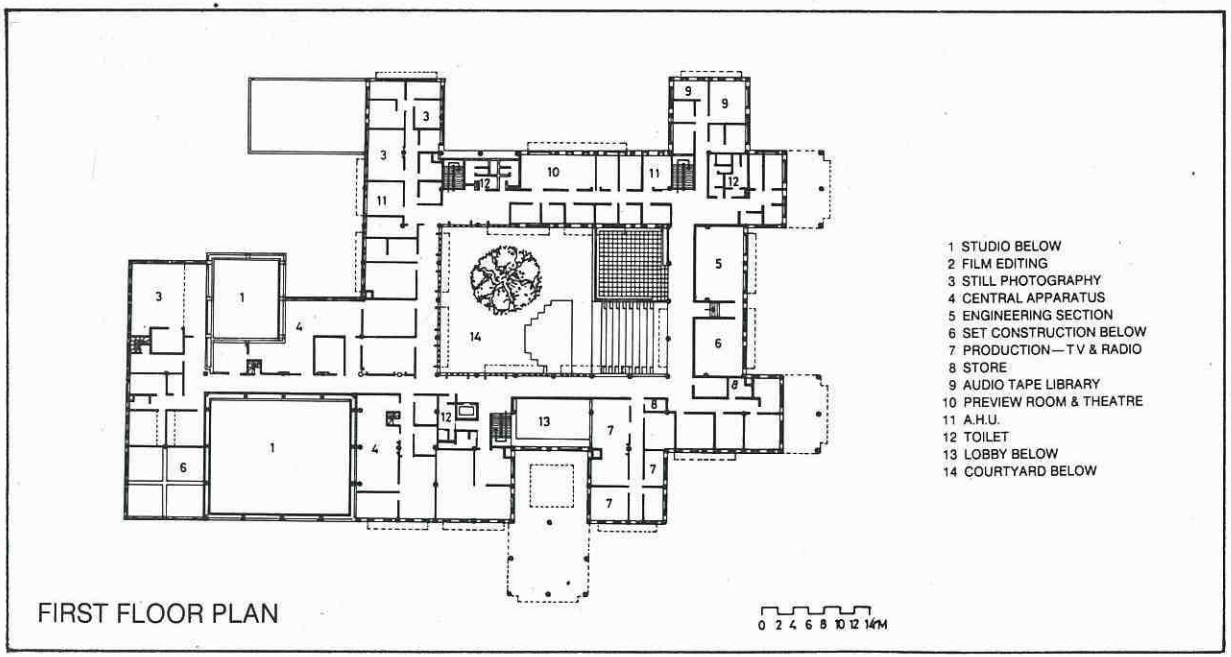
The structure system comprises prefabricated waffle slabs, supported by exposed-concrete circular columns creating a clear span of 10 metres. Multiples of the square module and its variations of projecting balconies and recessed floors create a richness and complexity based on structural order and contribute to the character of the buildings. The in-fill external walls are clad with sandstone, based on a modular pattern.



A view from the balcony

Steps leading to the first level






FIRST FLOOR PLAN

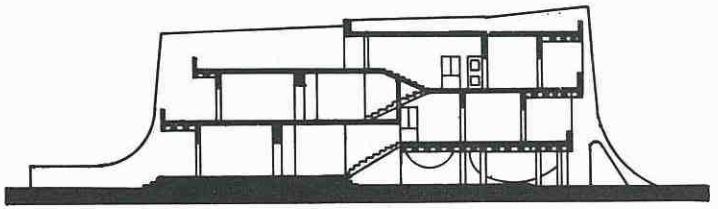
A view from the central court

## VST HOUSING, HYDERABAD (1976)

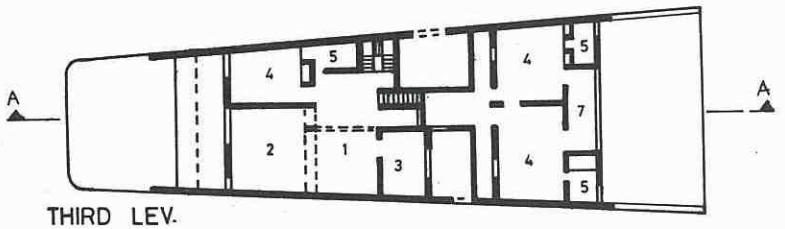
*Architect:* Satnam Namita & Associates, Chandigarh.

A staff housing complex of the Vazir Sultan Tobacco (VST) Company is located on the picturesque Banjara Hills in Hyderabad in Andhra Pradesh.

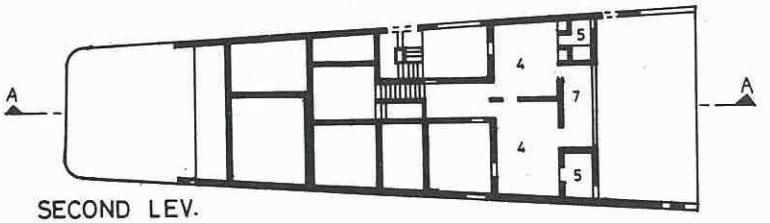
The concept is based on the imperative that there should be traffic-free community spaces where people can celebrate festivals and children can play safely. The traffic is limited to two extreme edges of the complex. Units are staggered and directly linked with the road. In this way an enclosure with the remaining two edges is formed. The living areas in all the houses open and extend into this enclosure, strewn with large sculpturesque boulders and commanding a panoramic view of the Hyderabad city.



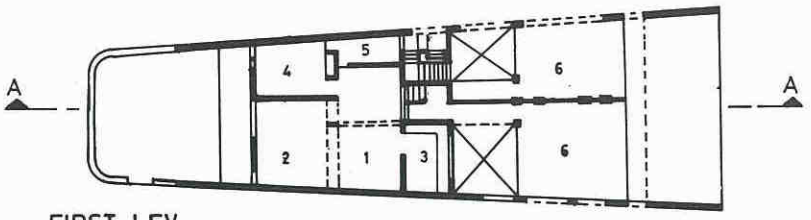
SECTION




THIRD LEV.




SECOND LEV.

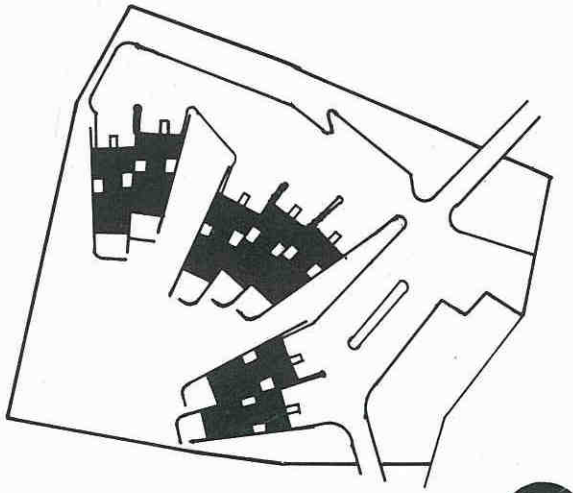



FIRST LEV.

0 5 15 M

1 DINING/LOUNGE
2 DRAWING ROOM
3 KITCHEN
4 BED ROOM
5 TOILET
6 CAR PORT
7 BALCONY

PLANS



0 6 18 36 M

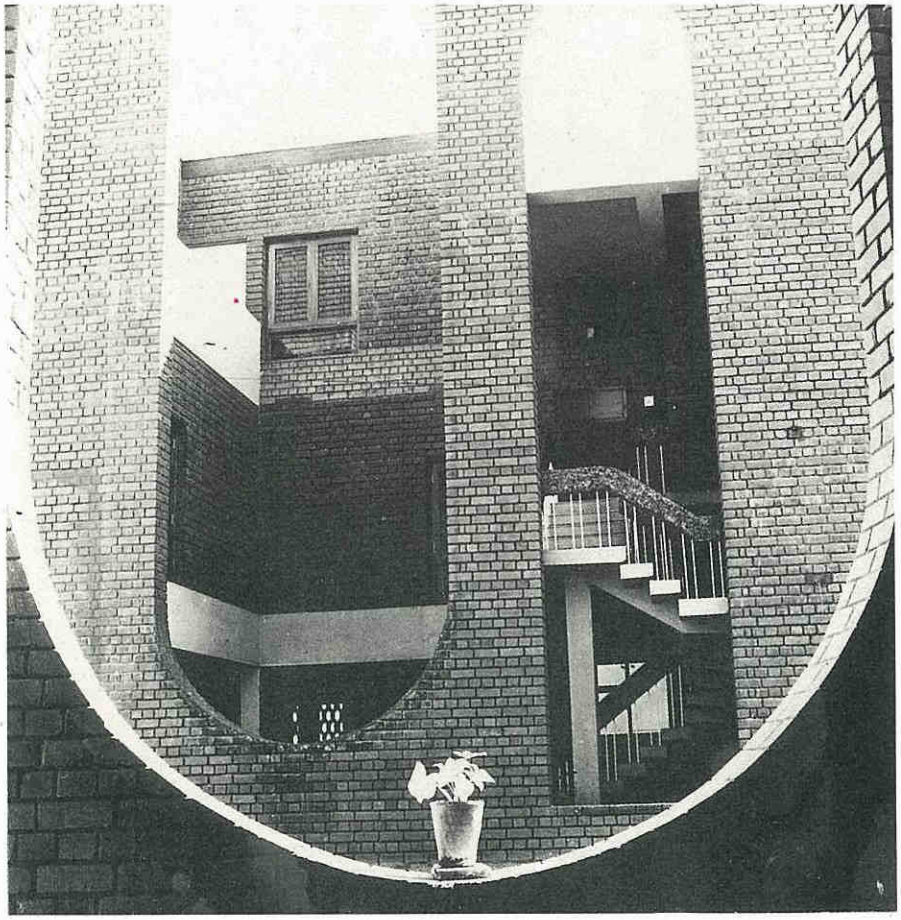
N

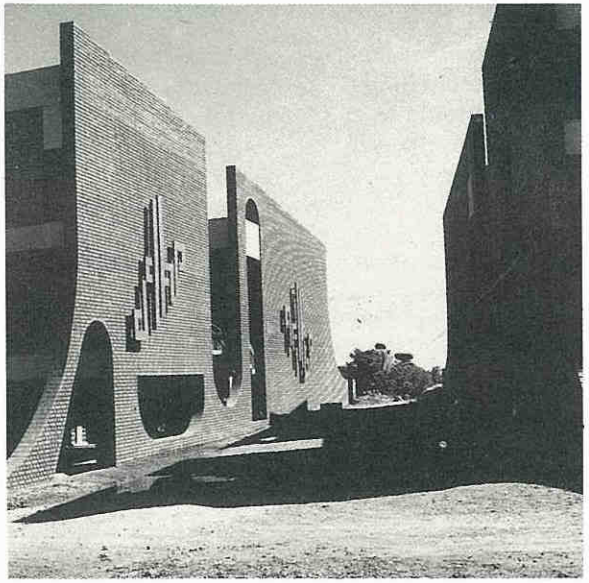
SITE PLAN

Flats are resolved into long linear, split level plans to give residents an equal opportunity to participate within the community space. Openings are provided on two sides and necessary cross-ventilation is ensured by the internal court. Every upper-level flat gets an open terrace for outdoor activities, half a flight above the bedroom level.

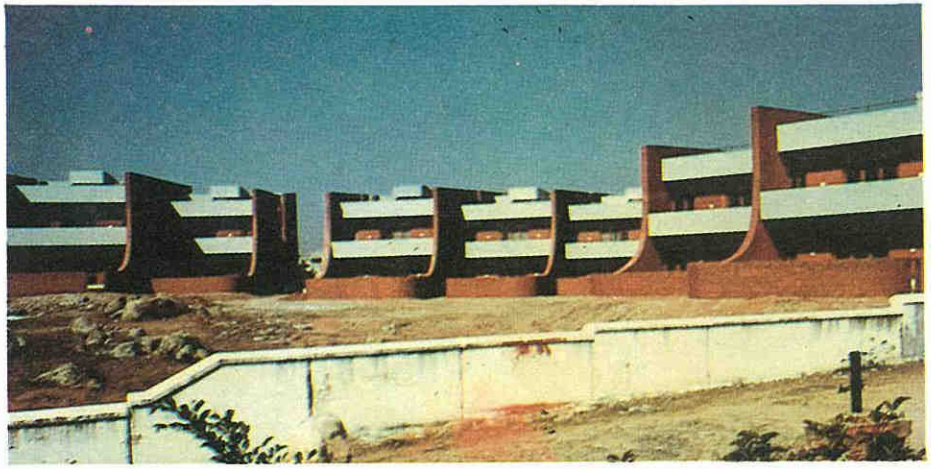
Bricks are kept exposed to highlight their aesthetic appeal and to minimise the maintenance cost. Reinforced-concrete work is plastered and painted white.

Truth is rhythm—even in brick





Peaceful coexistence of light and shade



Interplay of housing and community space

## NEHRU SCIENCE CENTRE, BOMBAY (1976-83)

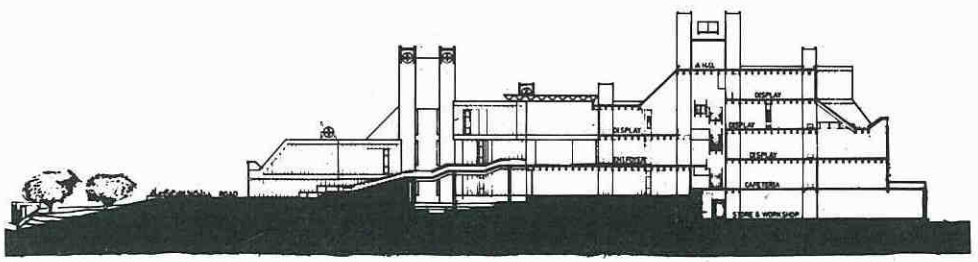
*Architect:* Achyut Kanvinde, New Delhi.

The Nehru Science Centre in Bombay, essentially a museum of science and technology, occupies a 5.3-hectare, decisively sloping site, reclaimed from the marshy lowlands in the heart of Bombay. The multifunctional complex, with a built-up area of 15,000 square metres, comprises the science and technology museum, a hall of industry, children's museum, library, auditorium, seminar rooms and a cafeteria, besides administrative offices, an outdoor science park and the requisite services infrastructure.

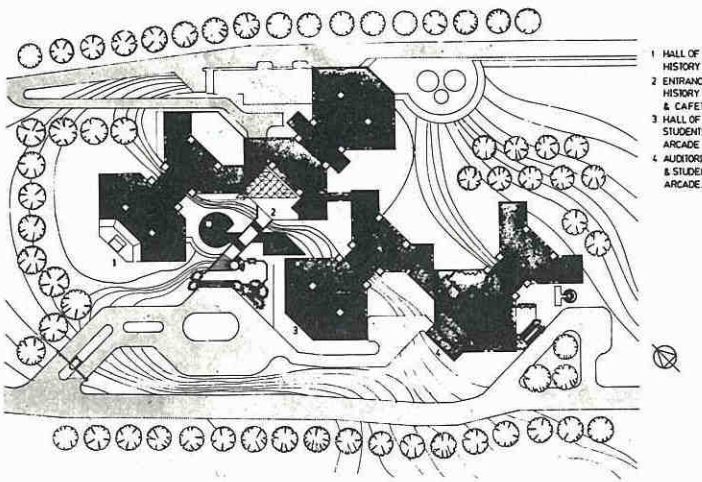
To promote amongst youngsters the scientific temper, a non-conventional approach has been adopted. The visitors are allowed to touch and handle the exhibits. The spaces and arrangements are so conceived as to stimulate the receptivity of the minds of the visitors. The design is based on multidimensional modular units with central service cores and structural shafts. These modules are integrated in such a way that in spite of their repetition they present variety in their overall disposition.

Public and material movements are completely segregated by providing the service areas on a low level and the public areas on the upper levels. The approach to the public areas is through a wide flight of steps leading from the landscaped forecourt. The circulation pattern is so designed as to direct the visitors to the various exhibition areas and then return them to the entrance hall, from where they can proceed to the cafeteria, the library, the auditorium and the heavy exhibit areas which are located on the ground level for easy accessibility. The movement of materials is through a vehicular ramp to the basement which is further connected to the exhibition areas through a large freight lift in the central zone.

The building is designed primarily for artificial lighting. However, minimal fenes-



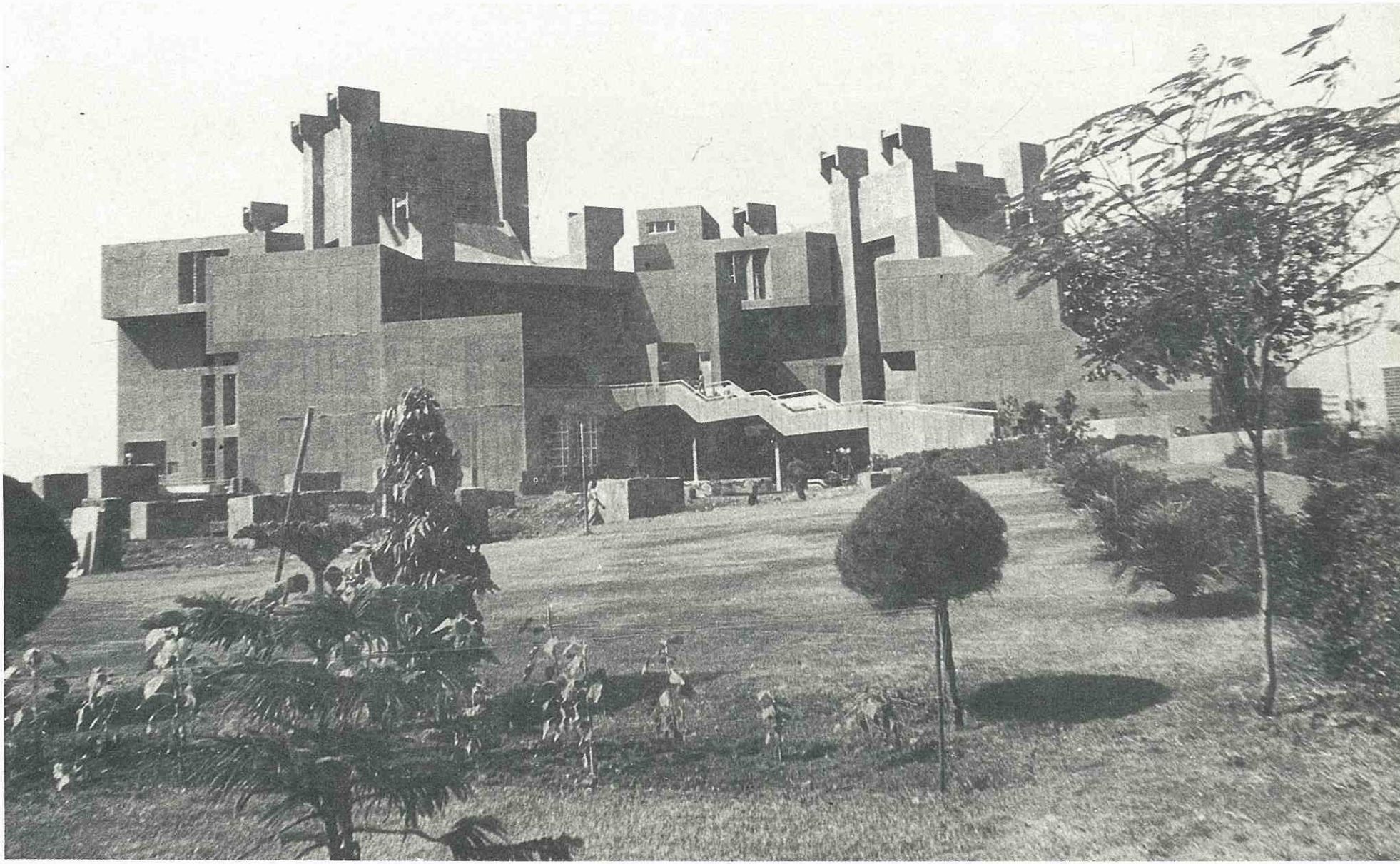
SECTION




PLAN

tration is provided to ensure natural lighting in case of a power breakdown. A structural system with waffle slabs comprises coffers of 1 metre square and reinforced concrete columns in the form of 2 by 2 metres hollow tubes, 12 metres centre to centre. It provides large column-free spaces allowing flexible use within. The hollow structural columns also act as ventilation shafts and are fitted with heavy duty exhaust fans at the roof level to accelerate air flow. All the external surfaces are uniformly finished with rough local stone aggregate.





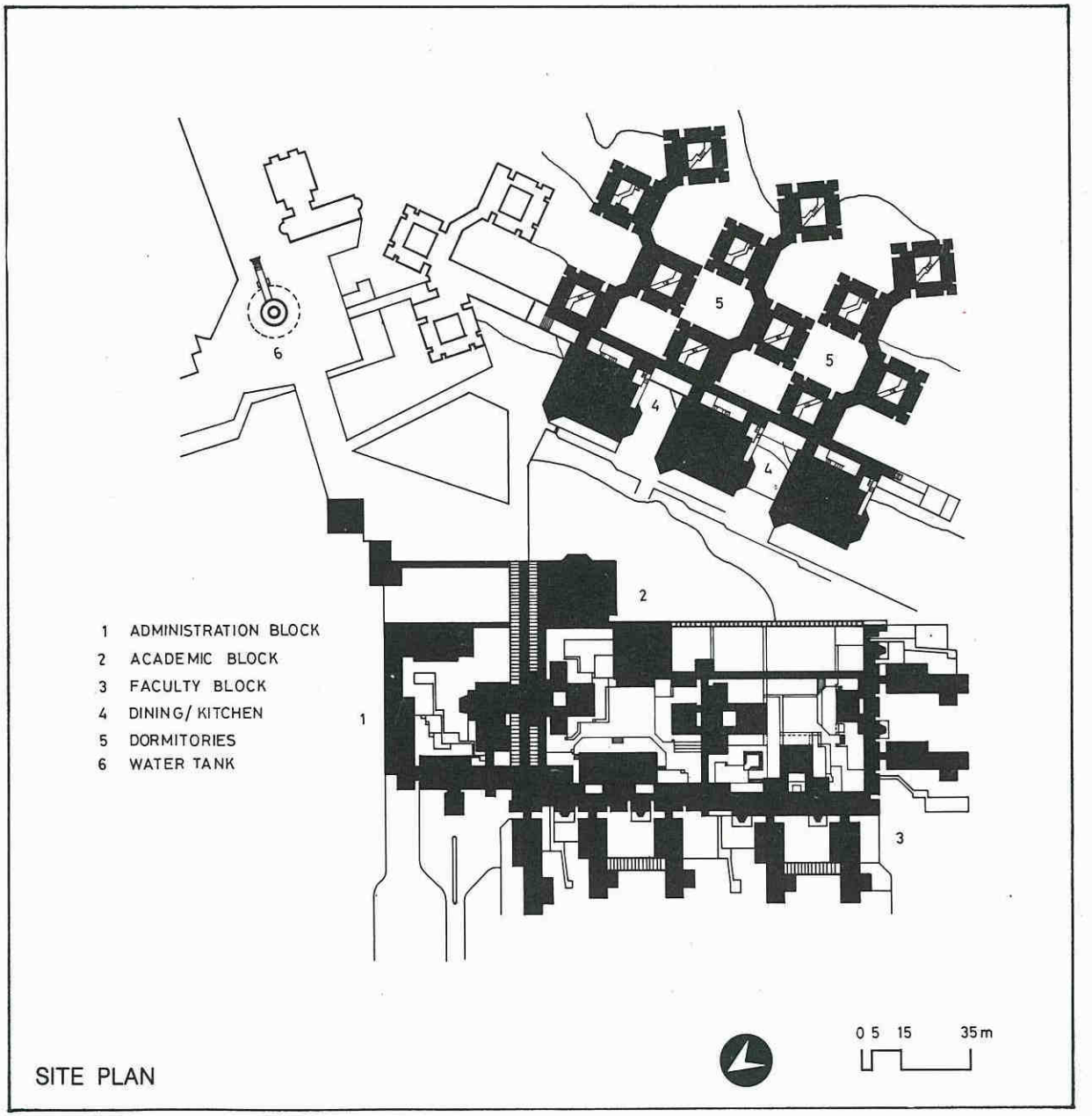
## INDIAN INSTITUTE OF MANAGEMENT, BANGALORE (1977-83)

*Architect:* Balkrishna Doshi, Stein Doshi and Bhalla, Ahmedabad.

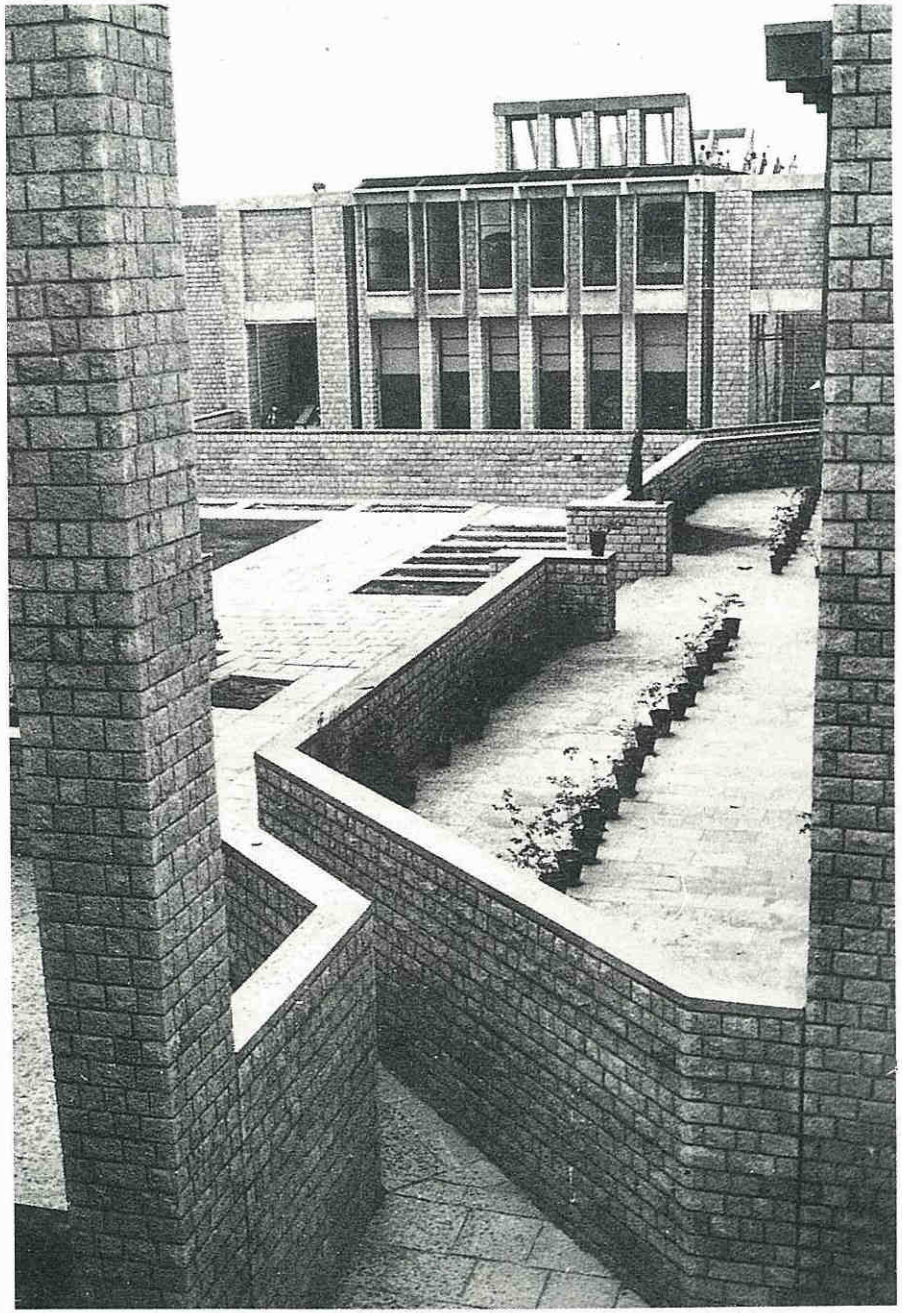
The Indian Institute of Management with 54,000 square metres of built-up area is located on the Bangalore-Bannerghatta road, south of Bangalore city.

The design of this academic complex has been steered and governed by the climate and culture of Bangalore, a garden city, the sloping topography of the site, the concern that buildings should not swamp the landscape, and the use of local materials. A system of major interior streets for movement has been adopted. The teaching spaces, faculty and administrative offices are dispersed along these circulation spines. The "streets" often stand agape on one side or are topped by skylights to admit the crystal clear stream of light. The width of the streets has been modulated at places to heighten the spatial experience and to promote interaction. To make important buildings like the lecture halls or the library stand out in sharp relief, the architect varied the scale of fenestration and sometimes used symmetry to display a beauty that has strangeness in proportion.

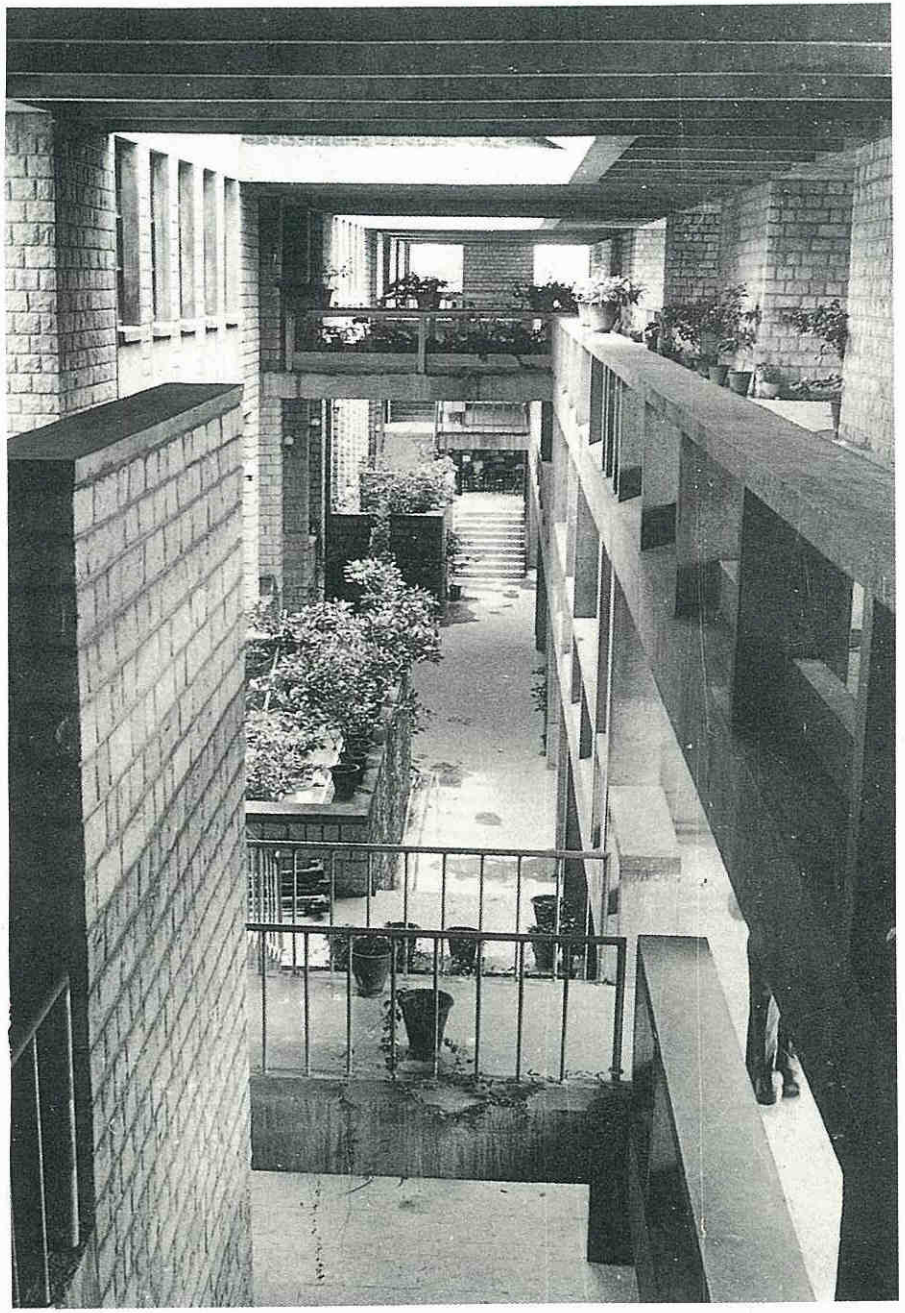
The fountainhead of the inspiration for the open spaces is derived from the courtyards of the Capitol Complex at Fatehpur Sikri. The interlocking courtyards are scaled to suit the functions located around them. The administrative block is placed on the north-eastern side. The "open office" planning in this block provides flexibility for reorganisation of interior spaces. Faculty offices with their garden courts are located to the north-west and south-west. Planned to accommodate 600 students, the dormitory blocks are linked together by walkways and verandahs. Each block has four wings of residential rooms which are arranged around a central court, creating a community feeling and a sense of security. Rough-hewn blocks of local granite stone have been used for the walls.




SITE PLAN

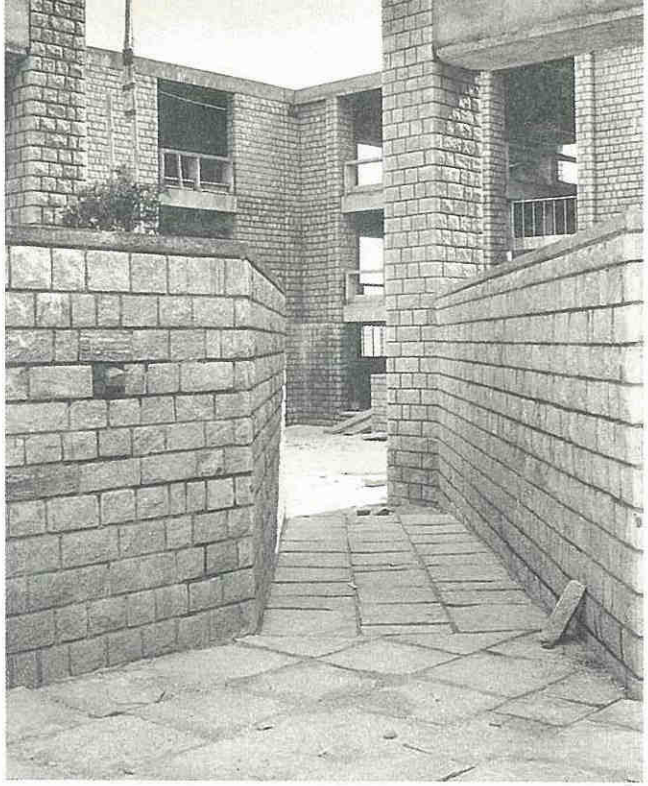


Coexistence of street narrowness and court openness.

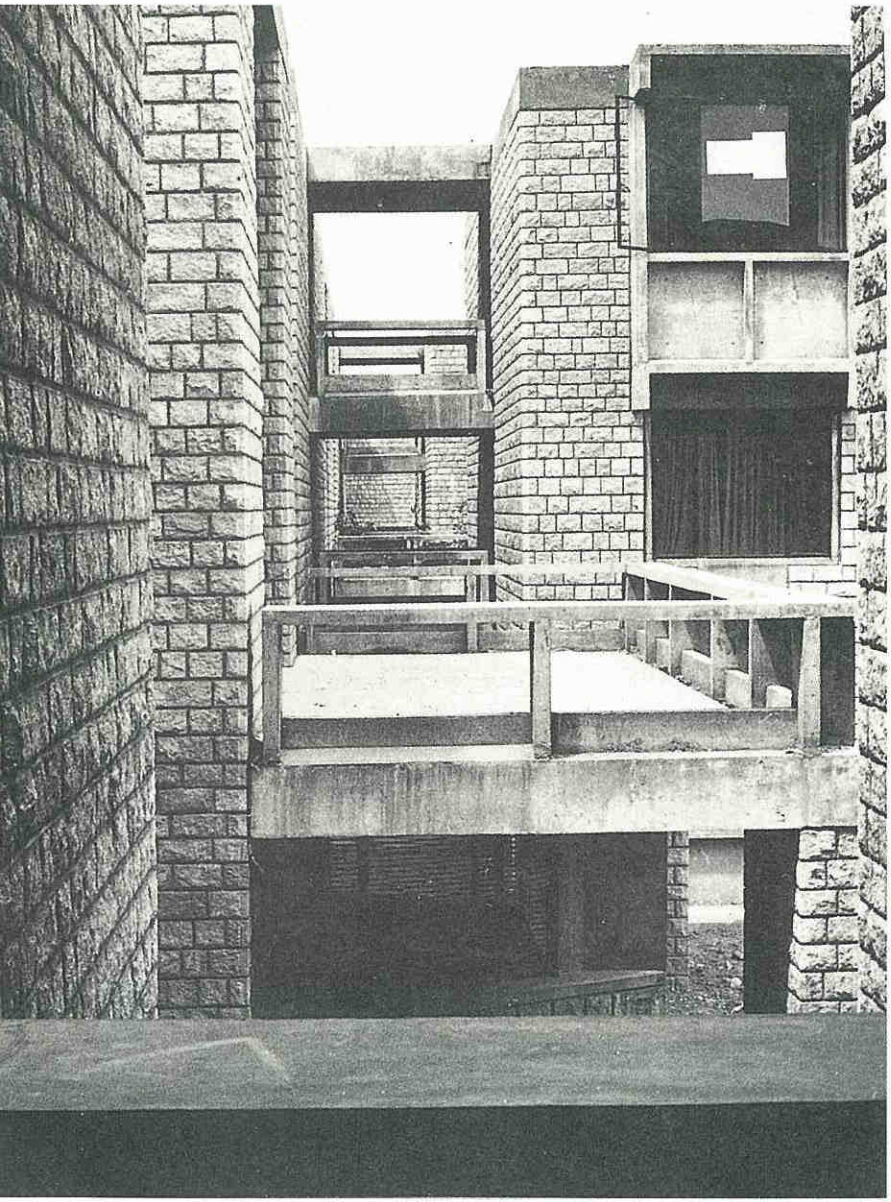


Robust spine for healthy interaction

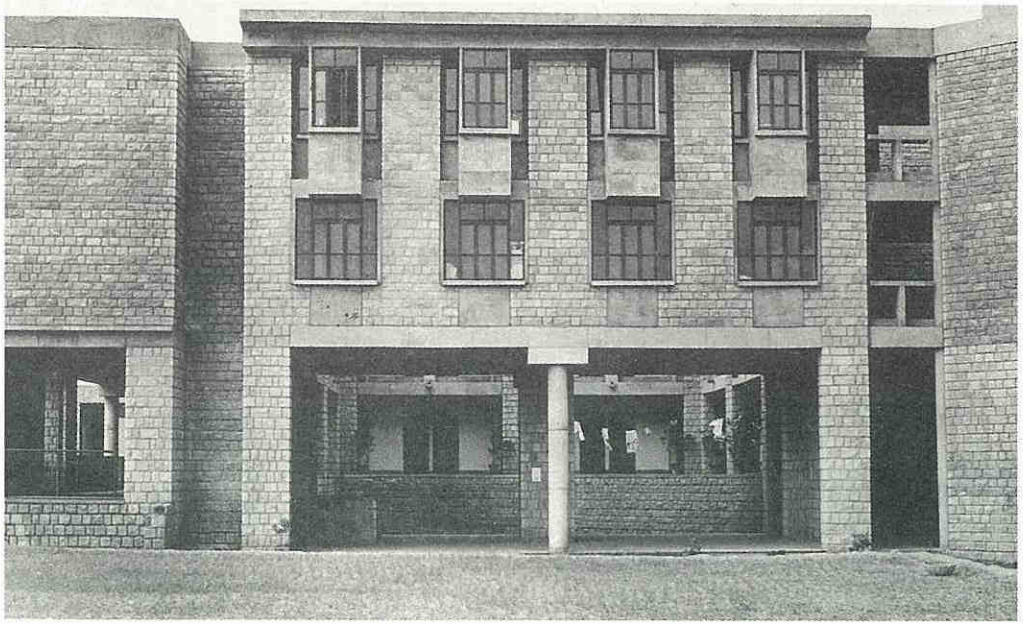
Streets that lead



Keeping faculty in touch with the spine



Central courts for community feeling



Passing through visual colourfulness



*Indian Institute of Management, Bangalore* **109**

## SRI DASMESH ACADEMY, ANANDPUR SAHIB (1978-83)

*Architect:* Satnam Namita & Associates, Chandigarh.

Sri Dasmesh Academy, a residential public school, is situated 5 kilometres north of Anandpur Sahib town in Punjab. The 81-hectare undulatory site commands a panoramic view of the Shivalik Hills.

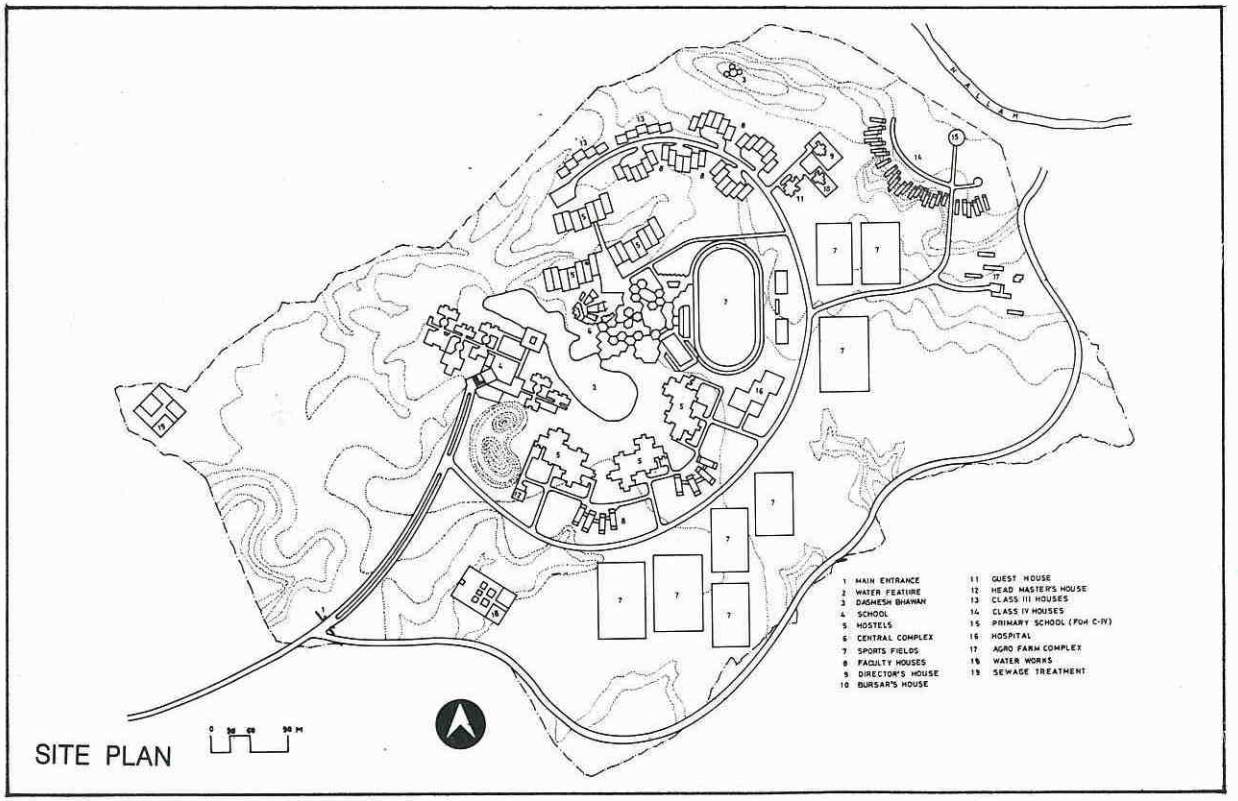
The campus plan keeps in view the traditional system of education in *gurukuls*. To make learning spontaneous, enjoyable and enriching, a series of spaces have been created where learning can continue all the time. The design has been conceived to exploit the topography of the site and to promote interaction between students and teachers. A natural depression in the site caused by erosion has been utilised for creating a "water feature", which forms the nucleus of the campus. The hostels, the school building and the central complex for recreational and cultural activities are wrapped around this water feature. This system of clustering all activities ensures that each person is an integral part of a larger whole. To encourage pedestrian movement within, vehicular traffic is limited to the periphery. Loose-ended walkways or blind alleys were avoided. Instead, landscaped avenues have been created.

An administrative building, flanked by the junior and senior schools on either side, opens out towards the library—the symbol of enlightenment. An assembly ground facing the administrative block has been carved out of the existing slope for morning prayers. All classrooms are oriented to get a pleasant view of the water feature and the natural north-east light.

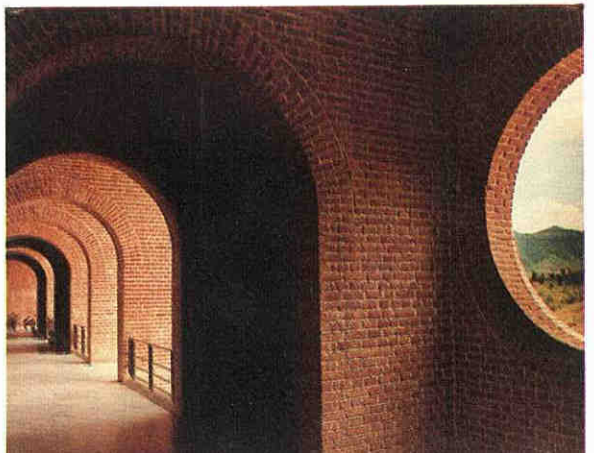
The hostels are placed in such a way as to restrict students from the teachers' residential area. Staggered hostel blocks are arranged in a specific relation to each other to create semi-enclosed spaces, ideal for playing games and informal get-togethers.

The staff housing is located towards the north-eastern side, on a picturesque slope bounded by a seasonal rivulet. The natural steep slope of the site has helped to segregate the residential areas from the academic zone. One-room tenements, arranged in a semi-circle, enclose a community space with a primary school. Individual tenements are approached by ascending stepped lanes, radiating from the community space.

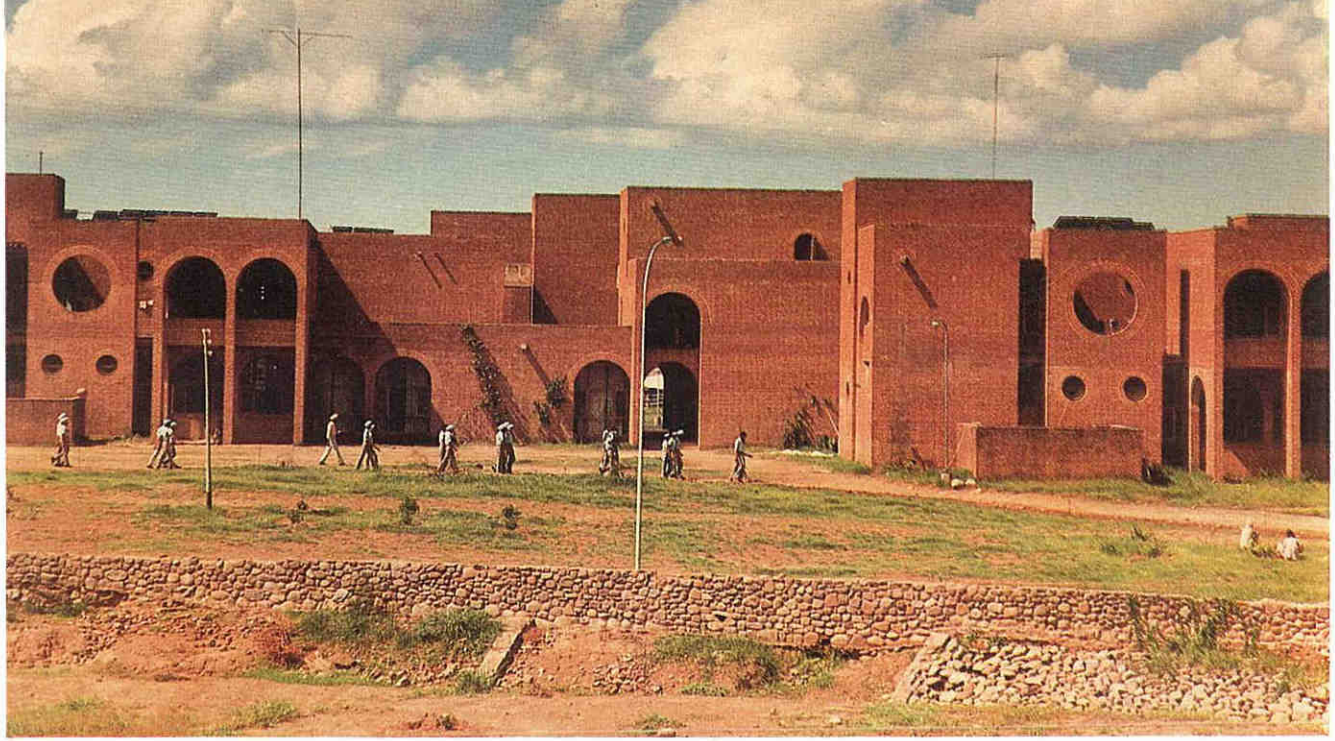
Locally available brick is used for exposed load-bearing walls. White lime is used as mortar in place of cement to economise on construction.

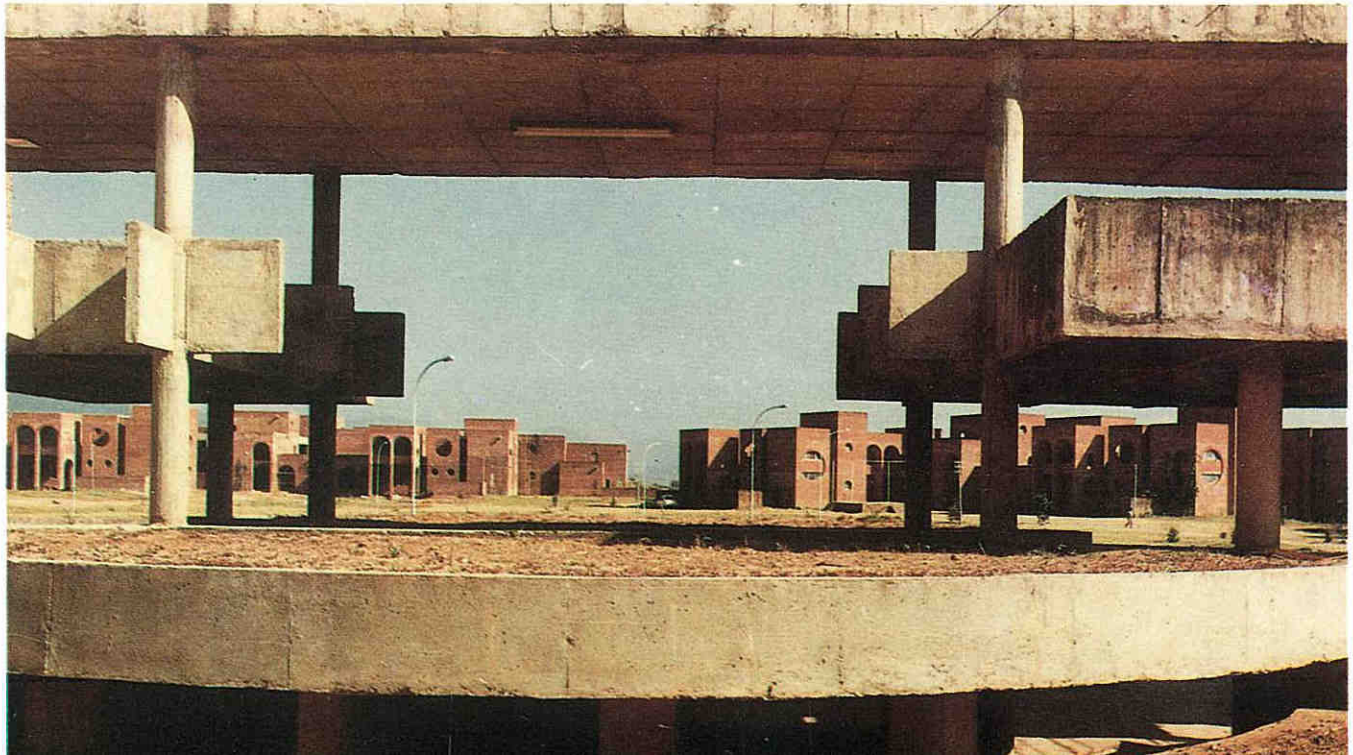



Circulate but rhythmically

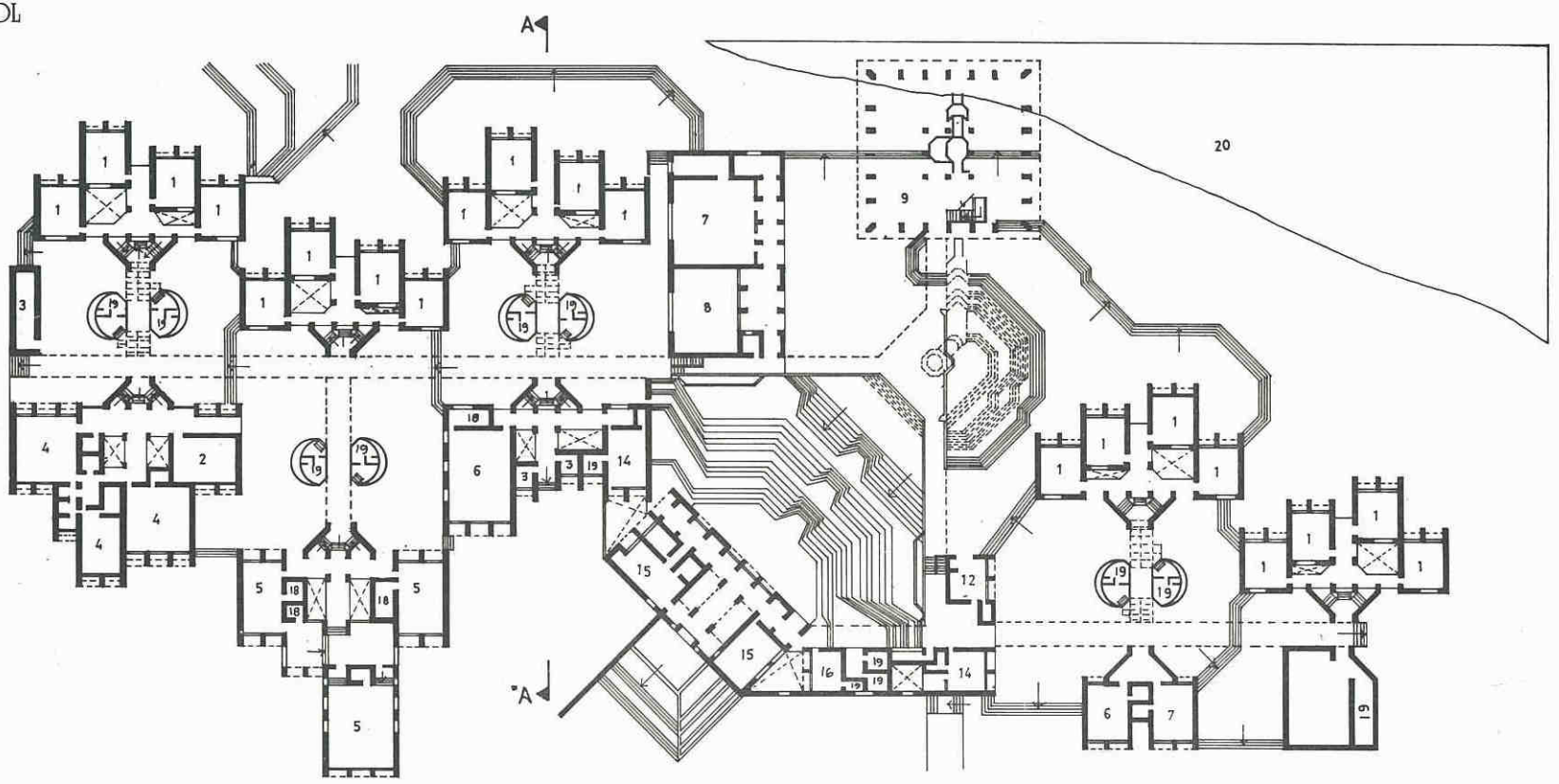


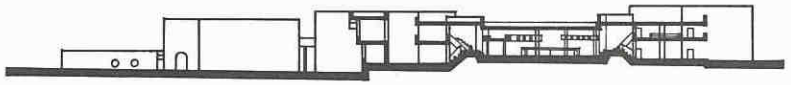
Thrill of massing: Hostels



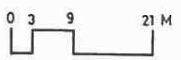


Inter-building communication.



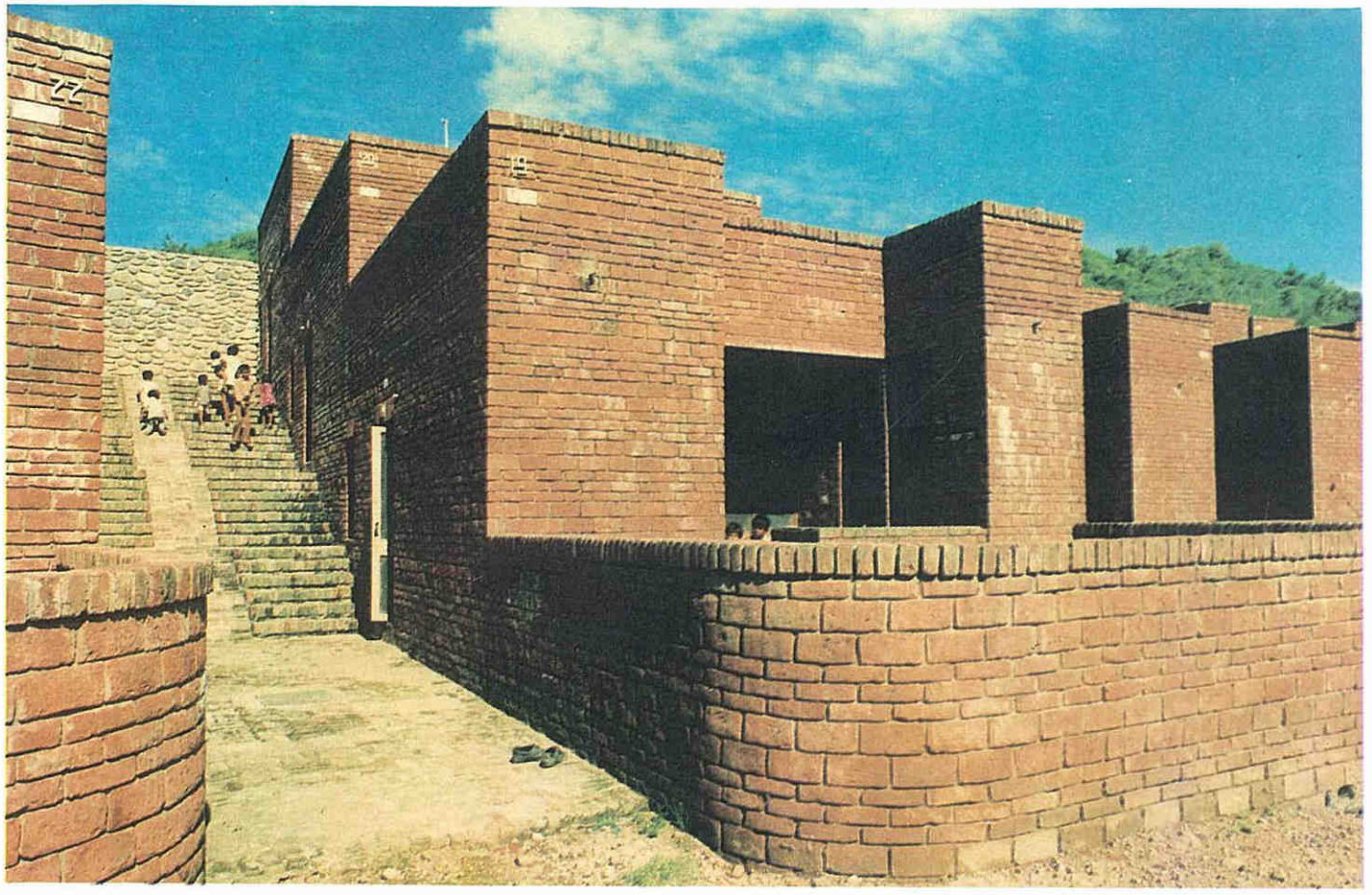



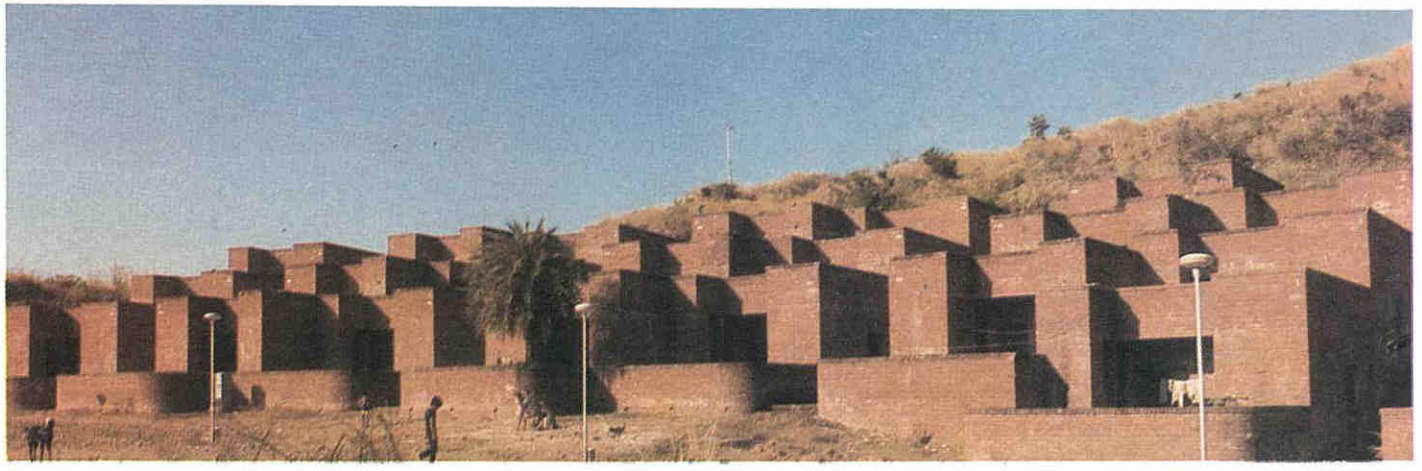
| | | | |
|---|---|---|---|
| 1 | CLASS ROOM | 11 | HEADMASTER'S ROOM |
| 2 | LECTURE ROOM | 12 | PRINCIPAL-JUNIOR SCHOOL |
| 3 | TUTORIAL ROOM | 13 | COMMITTEE ROOM |
| 4 | LABORATORY | 14 | STAFF ROOM |
| 5 | WORKSHOP | 15 | OFFICE |
| 6 | GENERAL SCIENCE ROOM | 16 | BURSAR'S ROOM |
| 7 | ART ROOM | 17 | TRUSTEE'S OFFICE |
| 8 | MUSIC ROOM | 18 | STORE |
| 9 | LIBRARY | 19 | TOILET |
| 10 | DIRECTOR'S ROOM | 20 | WATER FEATURE |




GROUND FLOOR PLAN & SECTION

Modern stepping—Rural milieu





Housing: Topographic echoes

## LOW-COST HOUSING, RAJKOT (1979-80)

*Architects:* Kulbhushan Jain and Minakshi Jain, Ahmedabad.

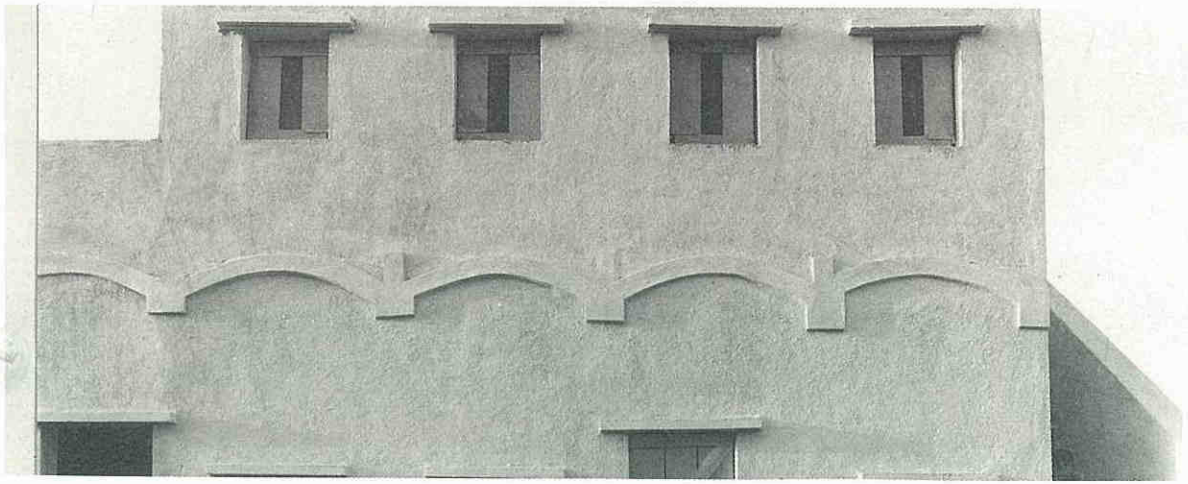
The low-cost housing complex in Rajkot is located on a 3.8-hectare piece of land on the edge of the town. This low-rise, high-density complex is well connected to the town as well as the highway leading to Ahmedabad. The gradually sloping site with a rocky base and a narrow frontage to the road offers ample scope to orient houses north and south.

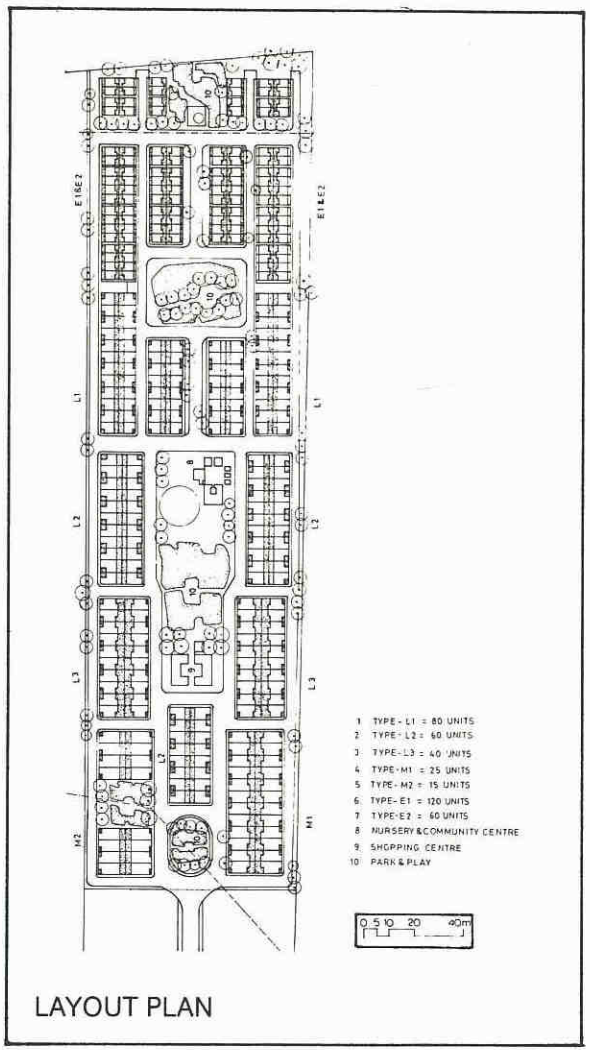
The scheme provides for a compact and harmonious living environment for three income groups—the economically weaker section (EWS), the lower income group (LIG) and the middle income group (MIG). These are accommodated in seven types of houses, with built-up areas varying from 20 to 100 square metres. The complex incorporates 400 houses with an overall density of 104 units per hectare, besides provision for community facilities like shops, a school, community hall and parks. All the housing blocks are two-storeyed—thus ensuring an open-to-sky court or terrace to every family. The houses are organised in a configuration of rows along linear streets and are oriented north and south. The shared side walls have helped in economising on the construction and, being unexposed to the sun, provide climatic advantage as well.

For the simpler and faster construction of the entire project, a system of modular coordination was adopted. This also established a uniform pattern in the entire scheme. A spanning module of 1.20 by 1.20 metres with a 23-centimetre wall or beam dimension was chosen for the construction. Load-bearing brick walls in lime mortar with the plinth in rubble masonry form the vertical support system. The roof spanning followed the traditional method of jack-arches. These arches are supported on reinforced-concrete beams, shaped to provide a proper base. Part of the beam depth is inverted to reduce the hanging depth in the rooms. All the vaults are spanned parallel to shared walls and project a little on the front and rear facades. This acts as a unifying element and lends a truthful expression to the entire scheme.

The external surfaces are finished in rough-cement plaster. The internal surfaces in the EWS and LIG Group I units are plastered upto the lintel level only. Floor finish ranges from mud in the smaller units to cement in the larger ones. The doors and windows are frameless.

Compact housing at an affordable cost

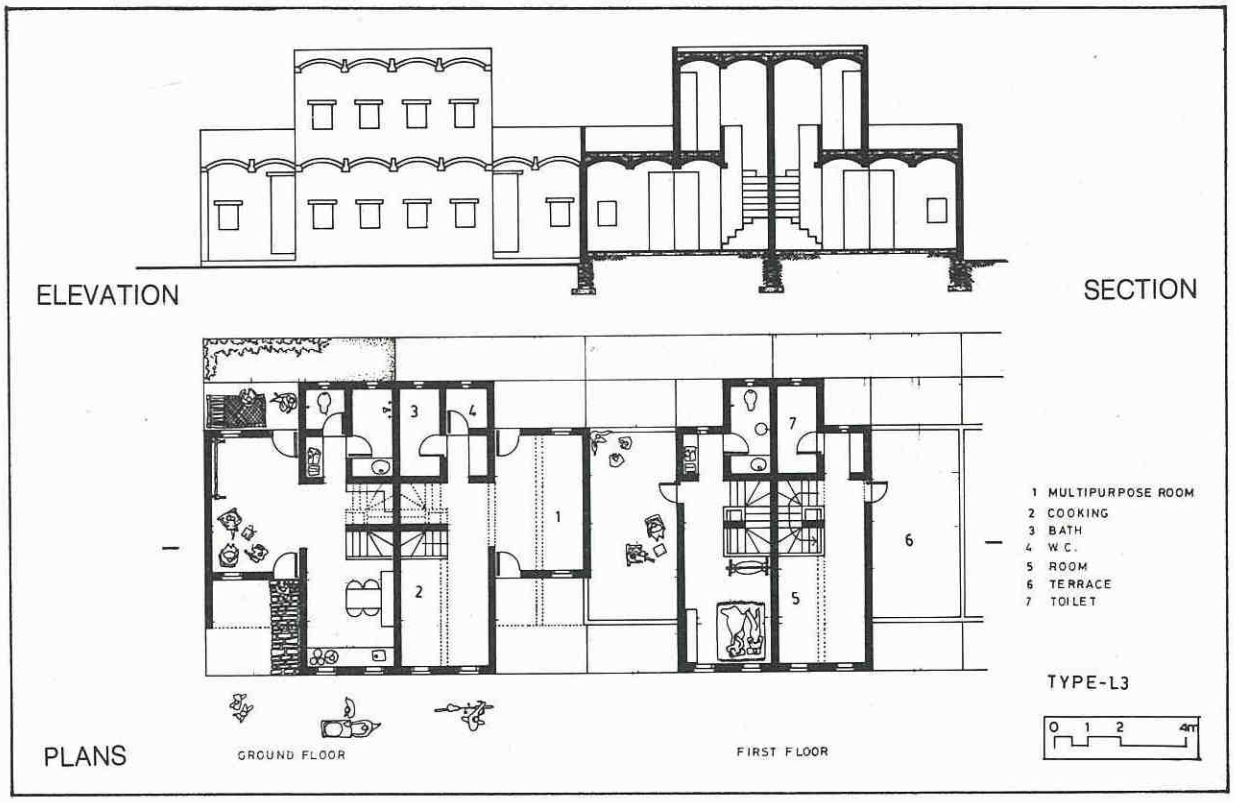


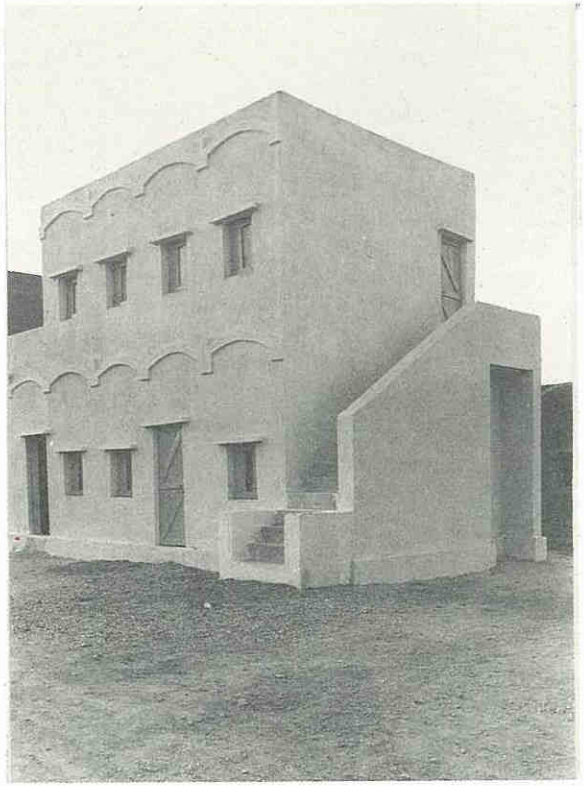



LAYOUT PLAN

Lyrical repetition

Vernacular architecture provides a modern touch



## SANGATH, AHMEDABAD (1979-81)

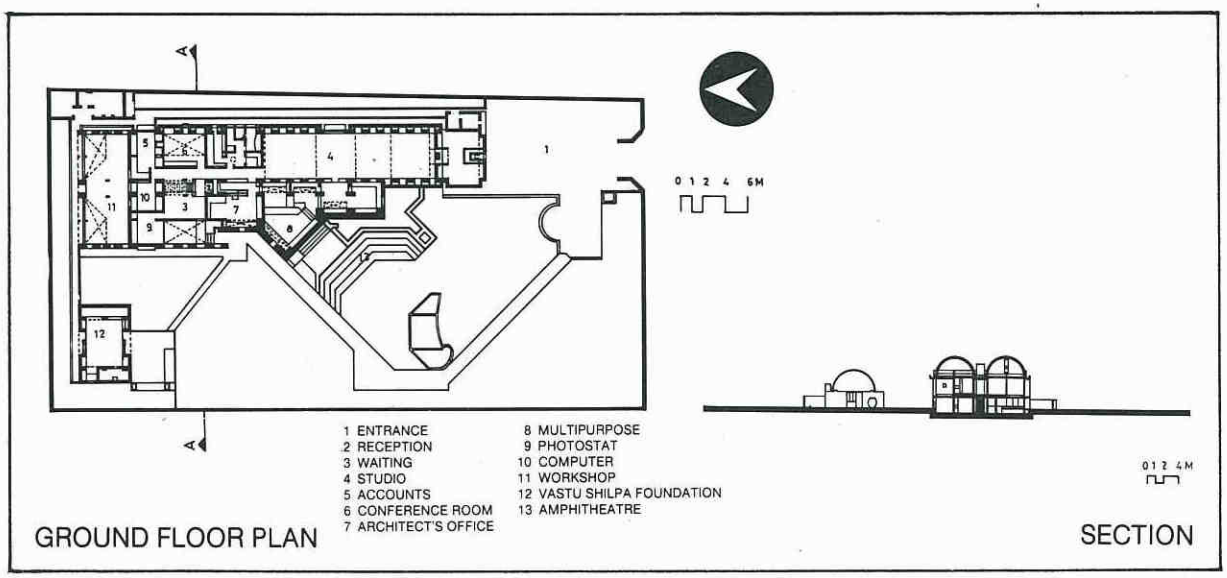
*Architect:* Balkrishna Doshi, Stein Doshi and Bhalla, Ahmedabad.

The Sangath complex is located west of Ahmedabad city on the edge of the countryside. It has 585 square metres of built-up area. *Sangath* implies moving together through participation. It is an office complex, housing the architect's own office and the Vastu-Shilpa Foundation, which serves as a centre to encourage research activity in the fine arts and technology.

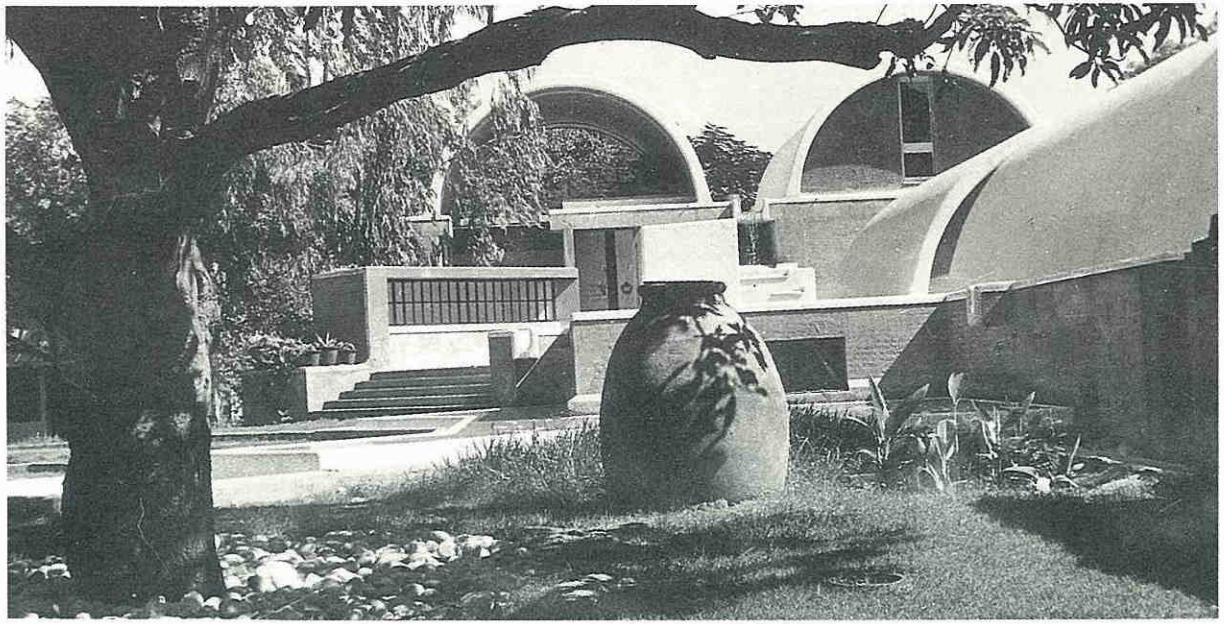
Architecturally, it is an attempt to evolve structures and forms which are suited to the local climate and which evoke the local ethos. The building has been partly sunk into the ground to shield it from the intense heat, maintain a low silhouette and to create a middle-level terrace for occasional outdoor demonstrations and exhibitions. A combination of light from the north entering from the glazed ends of the vaults, the reflection of the east light through skylights and direct light through glass bricks in the flat roof provides illumination for the interiors.

The basic design element is the vaulted roofing which, in profile, is reminiscent of a traditional Indian head-dress. To ensure better insulation, the vaults are made up of two thin layers of ferro-concrete with hollow ceramic fuses. The external surfaces of the vaults are finished with broken white glazed tiles which reflect incident sunlight, thus minimising heat absorption. Double walls not only help in reducing the effect of the sweltering heat of the sun but also provide ample space for storage.

To create a variety of spaces to suit different functions, three structural systems have been evolved. One involves using load-bearing brick walls supporting the vaulted roof, the second calls for a retaining wall and brick columns to support a flat roof, the third comprises load-bearing walls combined with a post-and-beam structure to carry heavy loads.

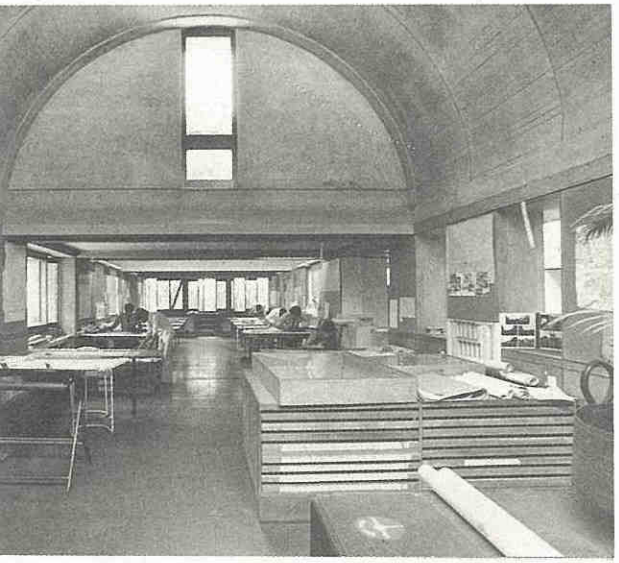



Making love with nature

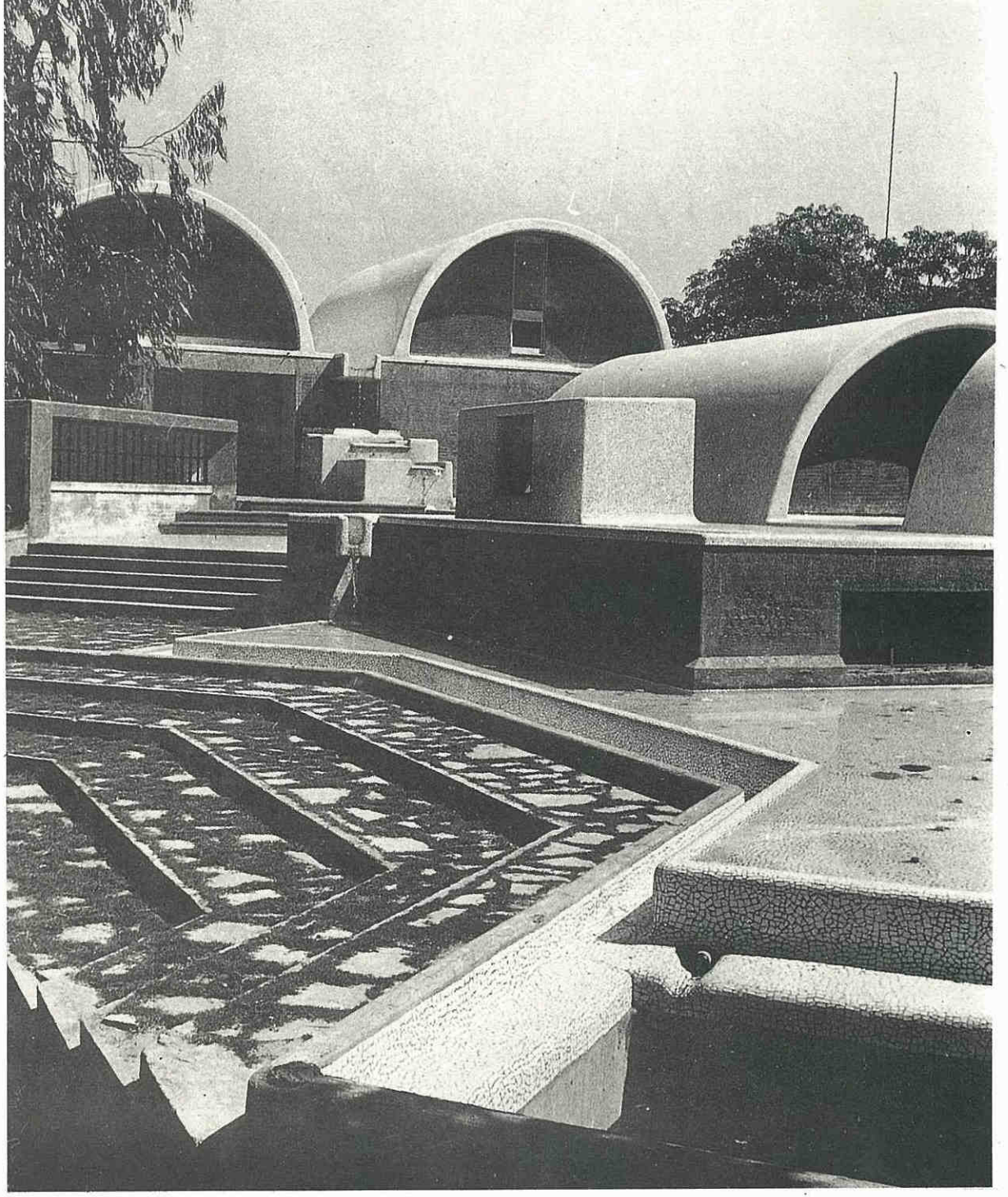


Water landscaping

Studio for innovations



Cosy office overlooking the amphitheatre for outside interactior



## ADMINISTRATIVE COMPLEX, MADHYA PRADESH ELECTRICITY BOARD, JABALPUR (1979-87)

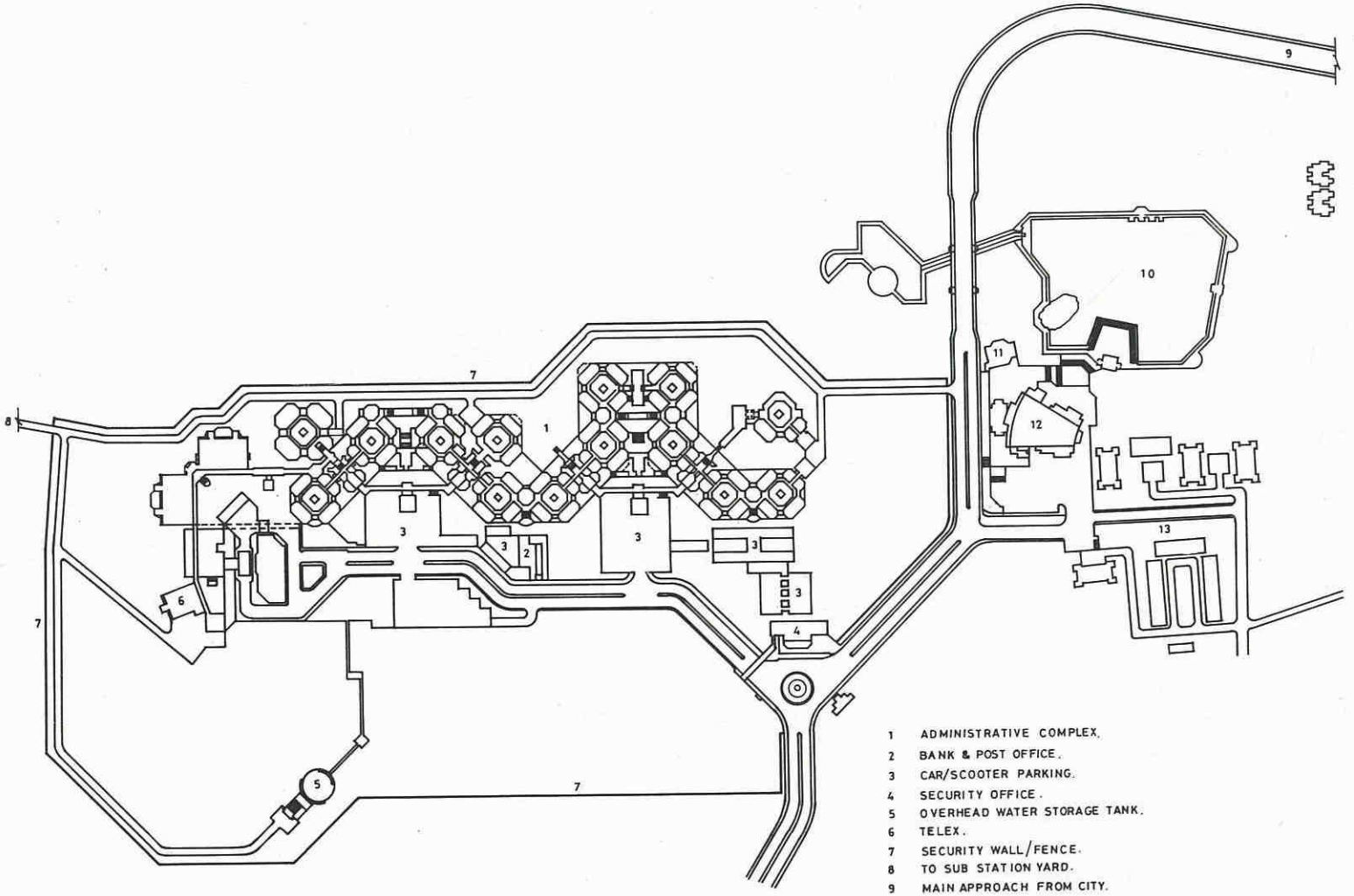
*Architect:* Balkrishna Doshi, Stein Doshi and Bhalla, Ahmedabad.

The administrative complex of the Madhya Pradesh Electricity Board at Jabalpur has 43,500 square metres of floor area spread over 13-hectare site. The MPEB selected this rugged, boulder-strewn site because of its close proximity to their existing office and residential areas.

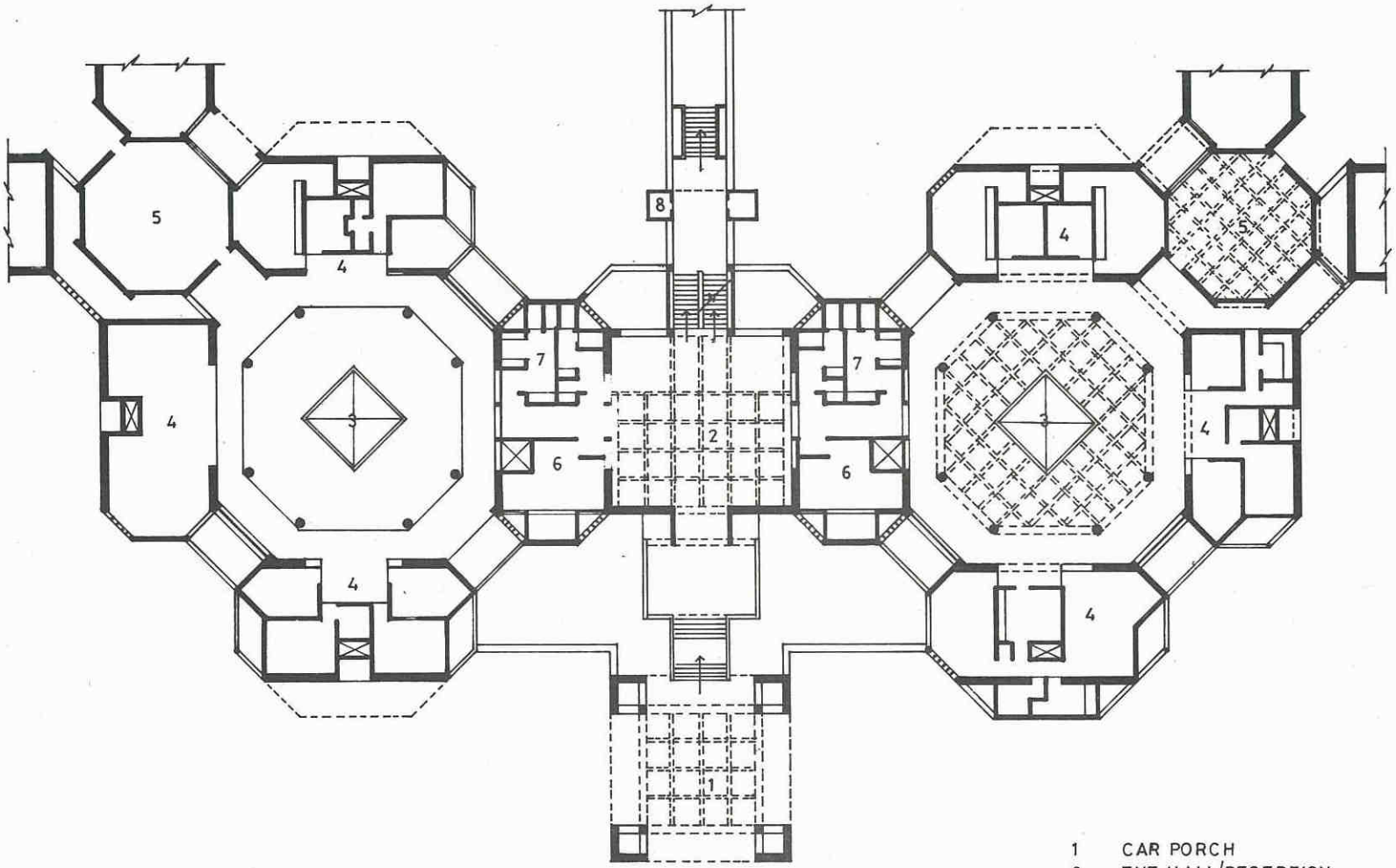
The design is so conceived as to integrate low-rise buildings with formally developed gardens and internal courtyards of varied scales into a total entity wherein almost every office and movement area opens to reveal framed vignettes of the surreal landscape. A study of old Jabalpur city revealed the use of courtyard planning to cope with the extreme dry heat of this region. Inspired by this courtyard concept, the offices have been arranged in polygonal clusters around courts to cut down on sun exposure. The office clusters are designed in such a way so as to be added to each other in all directions. The geometry has provided flexibility in planning the buildings in conformity with the topography of the site. A rhythmic response to the landscape is evoked by creating variations in the height. At certain locations, the floors have been eliminated to incorporate huge boulders. A clear hierarchy between the approach roads, the axial paths and the internal galleries has been followed. The vistas traverse clusters to capture the sights and sounds of nature.

Each cluster consists of two polygonal units in which offices and conference rooms are kept on the periphery to provide a view of the surroundings. An attempt has also been made to provide occasional views from the central office areas. The wooden fenestration is deeply recessed to ensure protection against the sun. Each unit is crowned with a skylight. Natural light travels down to lower levels through a central void. The entrance halls, elevators and stairways have exposed concrete finish to distinguish the circulation areas from the others. The external surfaces of the buildings are finished with washed grit. Horizontal strips of polished granite and exposed concrete bands highlight the geometric order animating the buildings.

A lesson in flexible geometry


1 ADMINISTRATIVE COMPLEX.
2 BANK & POST OFFICE.
3 CAR/SCOOTER PARKING.
4 SECURITY OFFICE.
5 OVERHEAD WATER STORAGE TANK.
6 TELEX.
7 SECURITY WALL/FENCE.
8 TO SUB STATION YARD.
9 MAIN APPROACH FROM CITY.
10 PANDUTAL.
11 RESTAURANT
12 AUDITORIUM
13 OFFICE
0 20 60 120 M

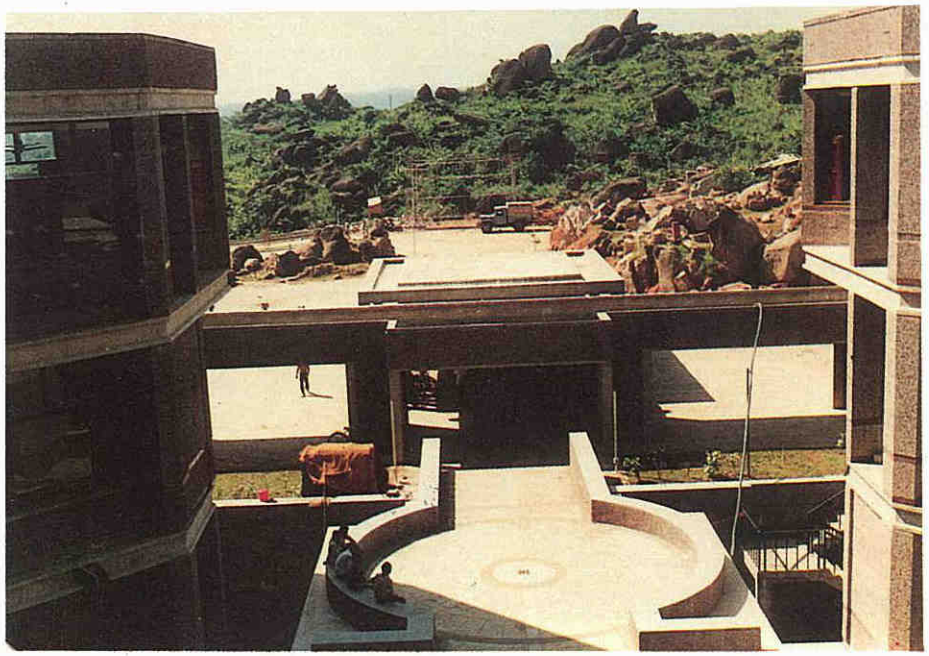
LAYOUT PLAN




OFFICE CLUSTERS PLAN

Nature: *in situ*

Boulder left undisturbed by the landscapist



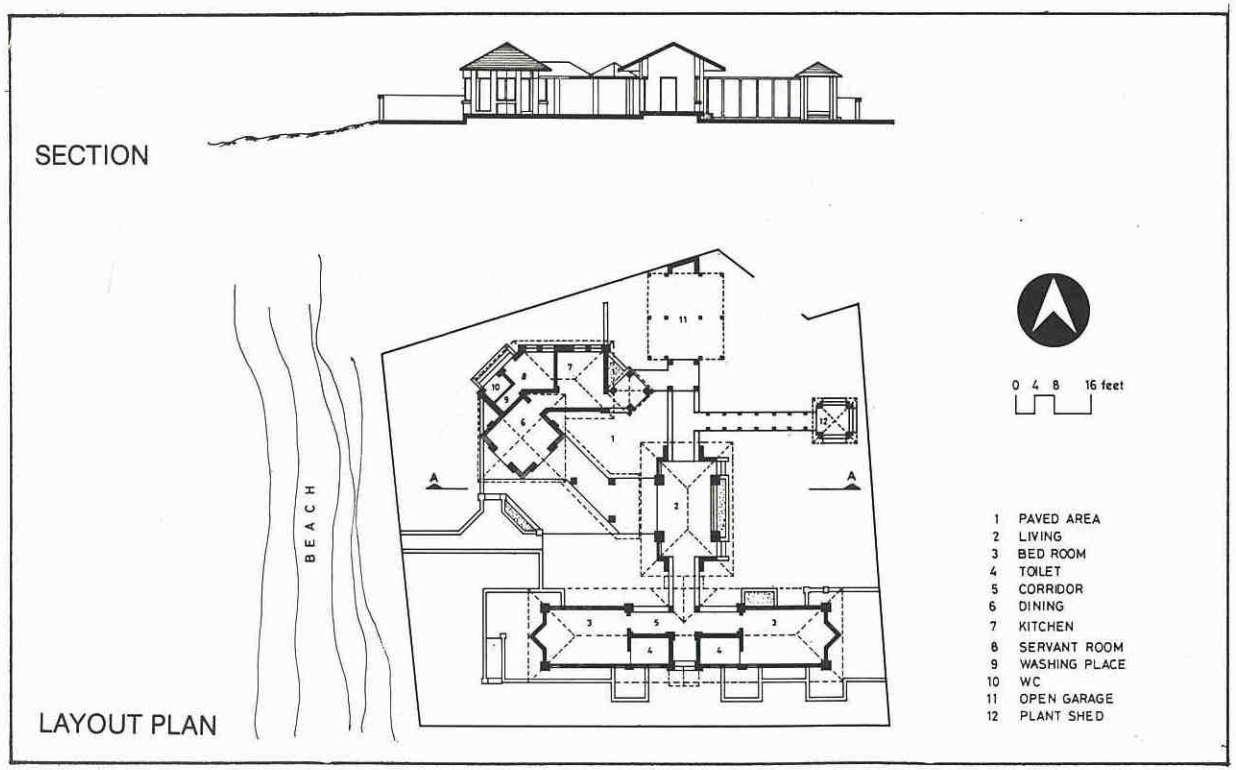
Utilising the backdrop of nature

## BEACH HOUSE, BOMBAY (1980-81)

*Architect:* Somaya and Kalappa Consultants Private Limited, Bombay.

Located on the Erangal Beach in Bombay Beach House has been constructed with a built-up area of 242 square metres. The architects conceptualised this project as a tourist camp and designed a series of pavilions for various functions. The camp layout adds to the holiday atmosphere that one feels on entering the site. The pavilions are connected to each other by open terraces and covered walkways which harmonise with the outdoors and the sea beyond. To make the surrounding space seem larger than it is, varying levels have been created around the building. A trellis-topped path, covered with creepers, leads to a small greenhouse.

Local stone has been used for the load-bearing walls. The profile of a nearby fishing village inspired the architects to provide Mangalore-tiled sloping roofs. These not only blend with the existing environment, but have also proved to be ideal for the heavy seasonal rains. Attractively patterned multi-coloured slate floors unify the different pavilions. The roofing system adds to the element of cohesiveness. Climatic considerations necessitated the use of paint rather than polish for the windows and doors. Beach House, with the ample use of natural materials, has a rustic, earthy quality that gives the visitors the feeling of affinity with nature.




Quest for excellence

## ASIAN GAMES VILLAGE, NEW DELHI (1980-82)

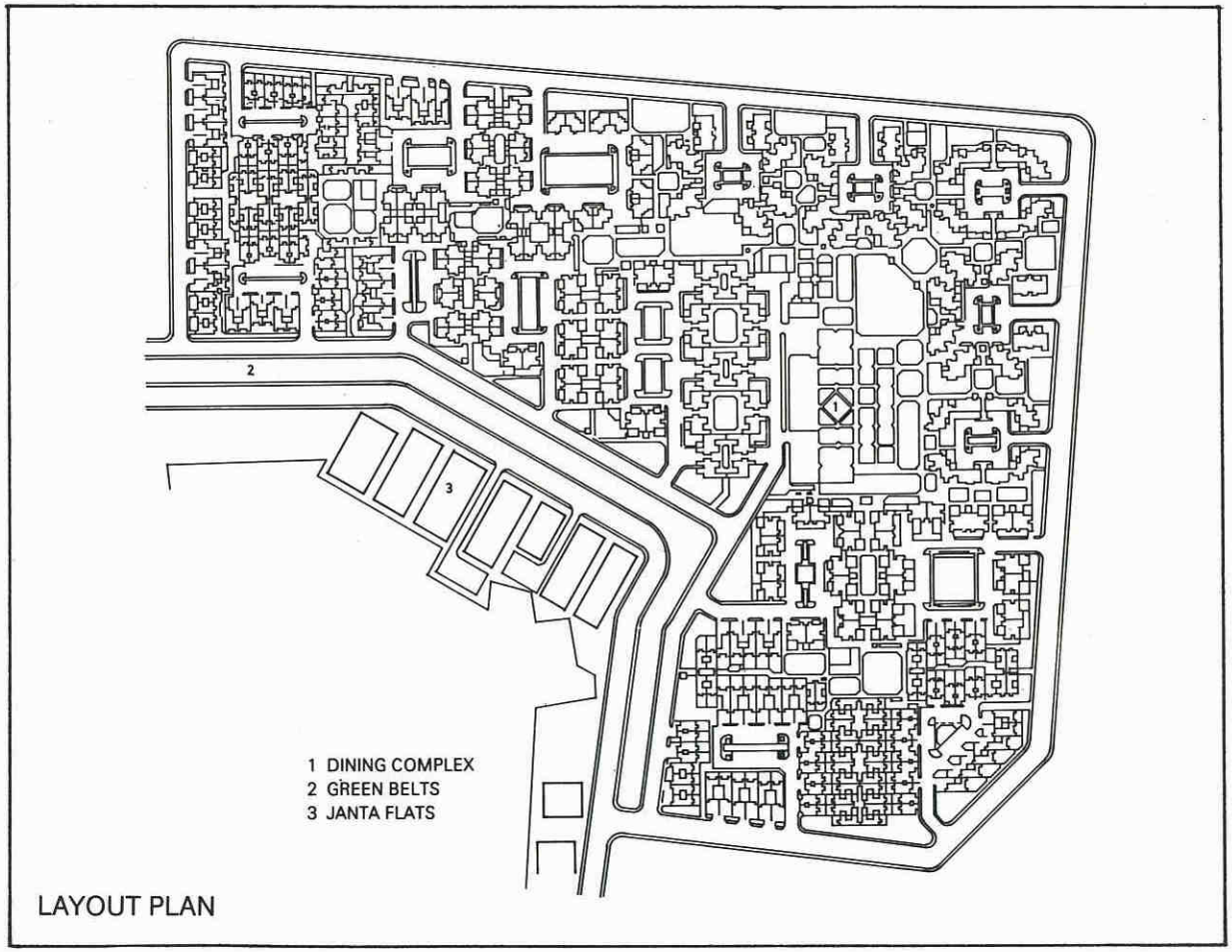
*Architect:* Raj Rewal Associates, New Delhi.

The Asian Games Village in New Delhi is a housing complex built on a 14-hectare site to house contestants from the participating countries in the Ninth Asian Games held in November 1982. It is located near the ruins of Siri Fort in South Delhi and consists of 500 flats and 200 individual houses in two- to four-storeyed construction, achieving a density of 50 units per hectare.

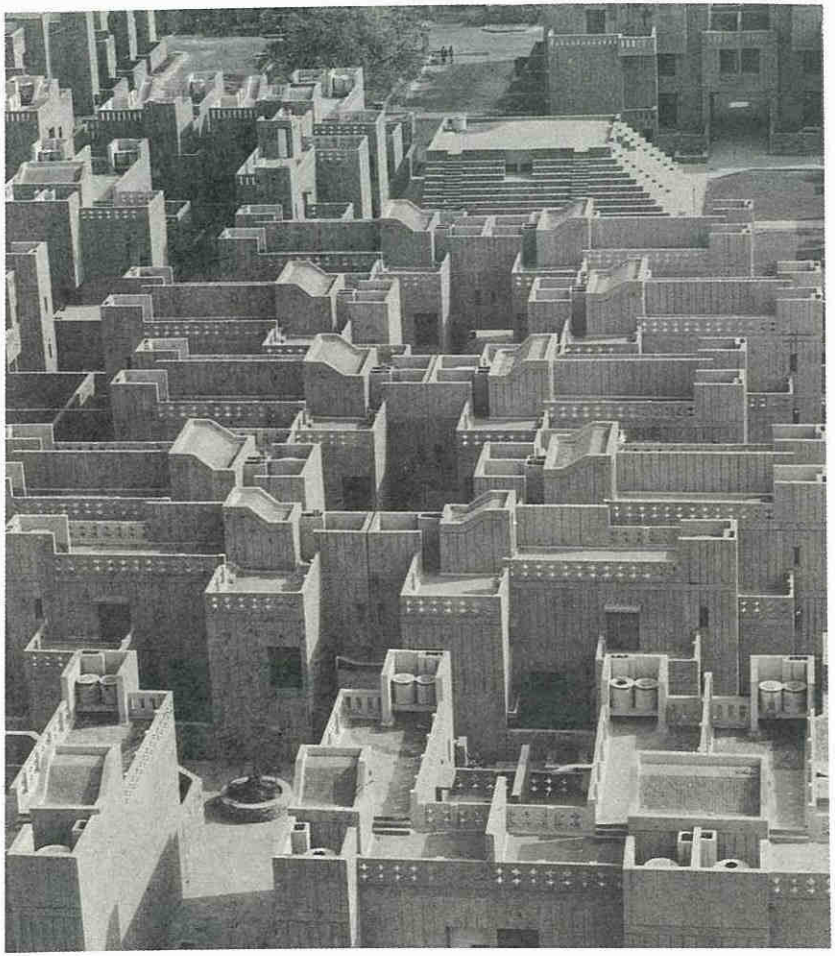
The layout simulates the traditional urban morphology of North India, incorporating the *mohalla* as the basic module for planning. The concept provides for pauses, spots for rest and changing vistas evolved through a sequence of spaces interlinked by narrow pedestrian streets. The spaces are enlivened through a careful mix of recreational and commercial uses. The streets are purposely broken up into comprehensible units and often defined by gateways. This provides for intermingling among the residents to give a sense of belonging to the neighbourhood square. A sense of enclosure and continuity of movement is maintained throughout the scheme, respecting the identity of spaces. The houses and roof terraces often overlook the streets and the open spaces, creating a sense of community participation among the inhabitants. The dining complex forms the central node of activities in the complex.

Vehicular and pedestrian movement is intentionally segregated. The peripheral roads are connected to *cul-de-sac* parking squares, which in turn give way to pedestrian paths or to the garages of individual housing units. A central pedestrian spine interconnects the courts and streets of various clusters.

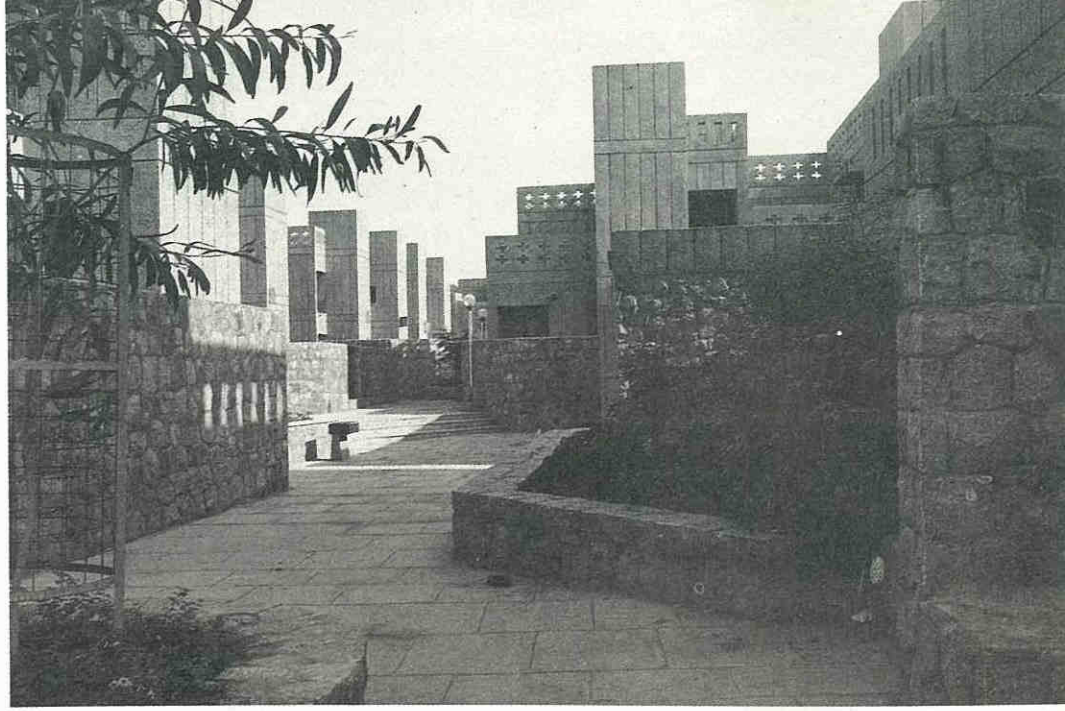
Each *mohalla* or neighbourhood comprises a cluster of 16 to 36 dwellings. The entrance gateways punctuate the sequence of spaces around communal courtyards and define clusters. Typical blocks of dwelling units have been so designed as to facilitate their linkage at all ends to form a street, provide a gateway, create squares or generate clusters. The flats are located along the inner pedestrian network. Each unit has its own independent open-to-sky space—either a courtyard or a terrace. Individually owned houses are identified by two-storeyed construction with narrow frontages. These are grouped on the periphery with private courtyards screened by high walls. To ensure easy maintenance, service ducts have cut-outs at the junctions of pipes. The terrace parapets are perforated to allow for air circulation without impinging on the privacy of the inhabitants.




LAYOUT PLAN



Aerial view of the Village



No pedestrianism in designing the streets

Keeping the 'Mohalla' style in vogue

The materials and colour combinations have been selected meticulously. The external walls of the buildings are finished in stone aggregate, while the courtyard walls are of Delhi quartzite stone. The pathways are paved with white or red sandstone. The gates, doors and windows are painted in different colours to give a sense of identity to the dwelling units.

## ASIAD AUDITORIUM, NEW DELHI (1980-82)

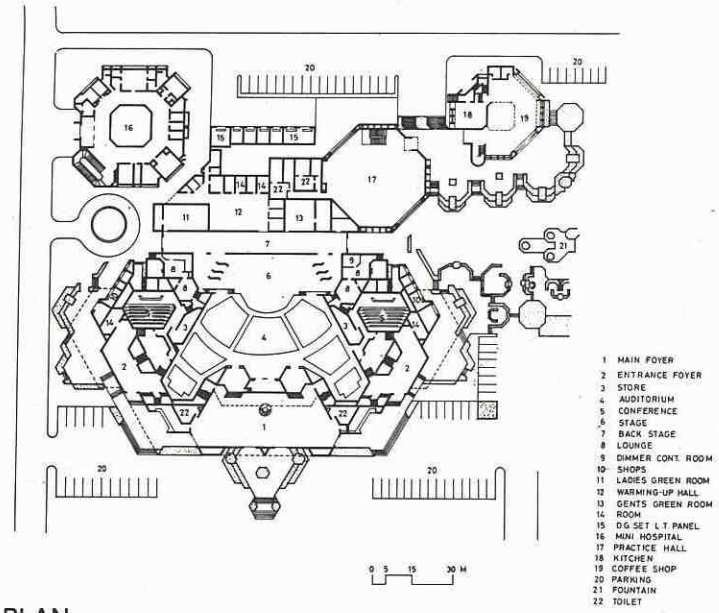
*Architect:* Sachdev Eggleston Associates, New Delhi.

Located on a 2.58-hectare site in New Delhi, the Asiad Auditorium has 9,300 square metres of covered area. It was built for the weight-lifting competitions and cultural activities proposed during the Asian Games in 1982. In addition, it also has rehearsal rooms, a small auditorium for 150 persons and space for seminars.

The complex includes a practice hall, restaurants and a mini-hospital, all of which were designed for the use of Asiad athletes.

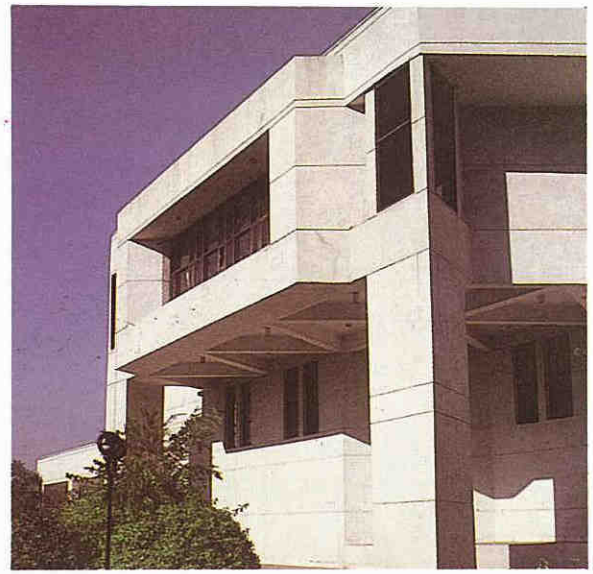
The auditorium was designed in such a manner that it could be converted into two cinema halls after the Asiad, but later was redesigned to become a permanent theatre for live performances.

An attempt has been made to achieve a close and intimate rapport between the audience and the performing artistes in a hall which has a capacity of 2,300. The compact structure has been divided into a number of distinct spaces. Six seating enclosures are designed around a central auditorium. The large stage has a capacity for 80 artistes, or a full ballet performance. Ample space in the wings allows for the easy movement of sets. Automatic dimmer controls and other special stage lighting equipment have been introduced for sophisticated performances. To provide appropriate acoustics, reflecting laminated panels, carpets and wall panelling have been used.

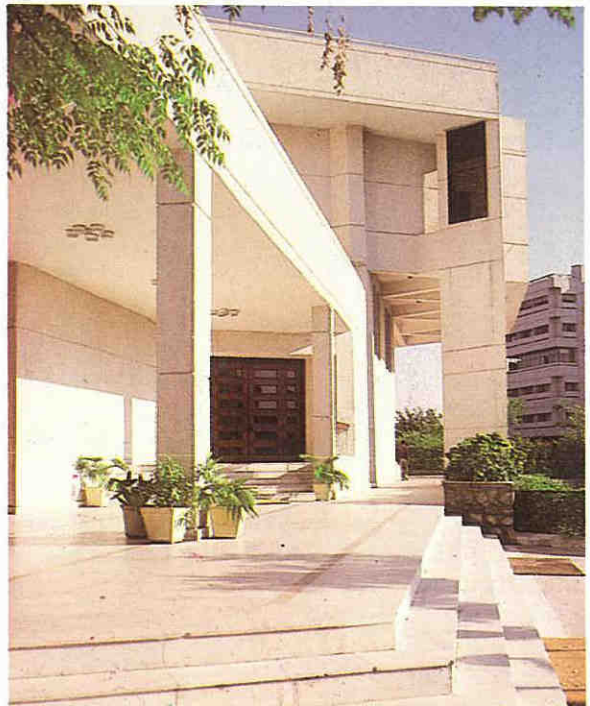



GROUND FLOOR PLAN

Sporting solidness: Built for sports giants



For a giant entry



Auditorium designed for cultural exposition and sports

The reinforced-concrete-frame structure has in-fill walls of brick. Steel trusses with sheet metal cladding has been used for the roof. Externally, the walls are finished in white grit.

## GANDHI LABOUR INSTITUTE, AHMEDABAD (1980-84)

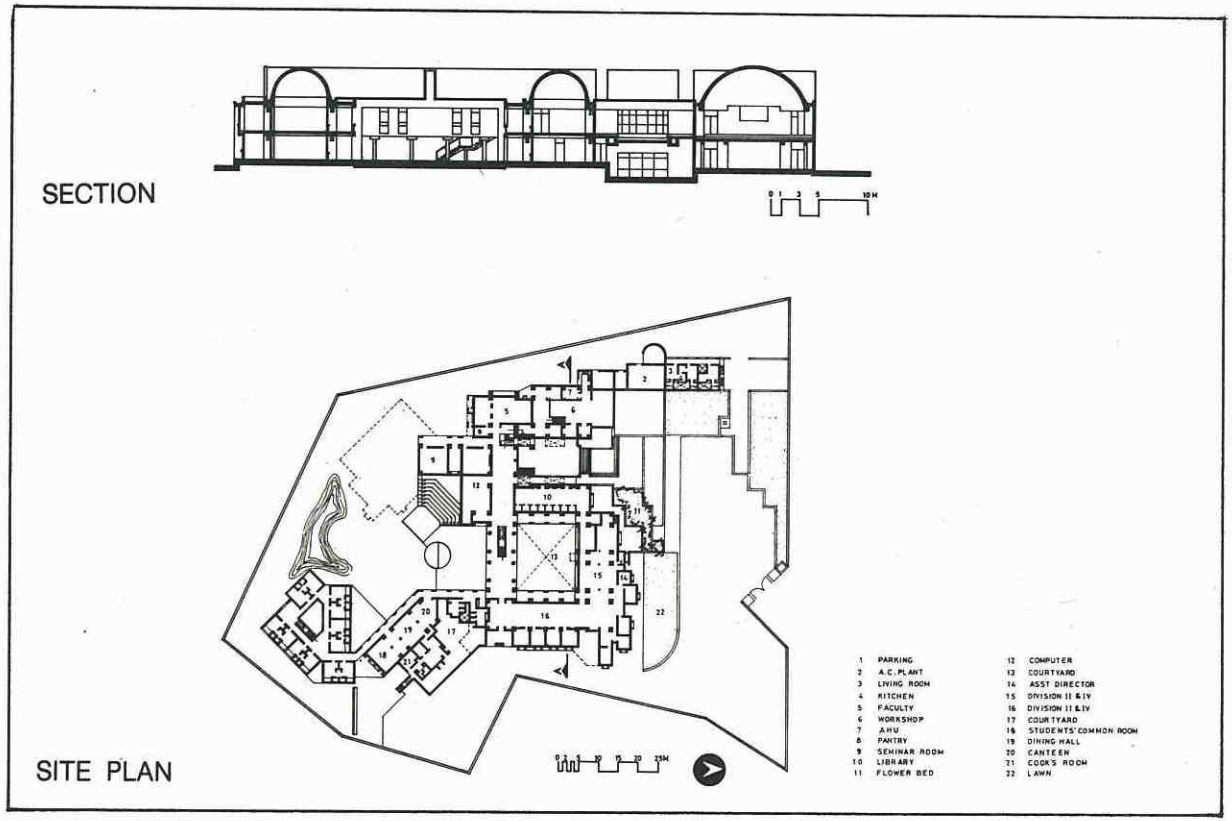
*Architect:* Balkrishna Doshi, Stein Doshi and Bhalla, Ahmedabad.

The Gandhi Labour Institute has 5,600 square metres of floor space and is situated on a four-hectare site in a western suburb of Ahmedabad. The institute conducts research, training, seminars and workshops in the field of labour management and welfare.

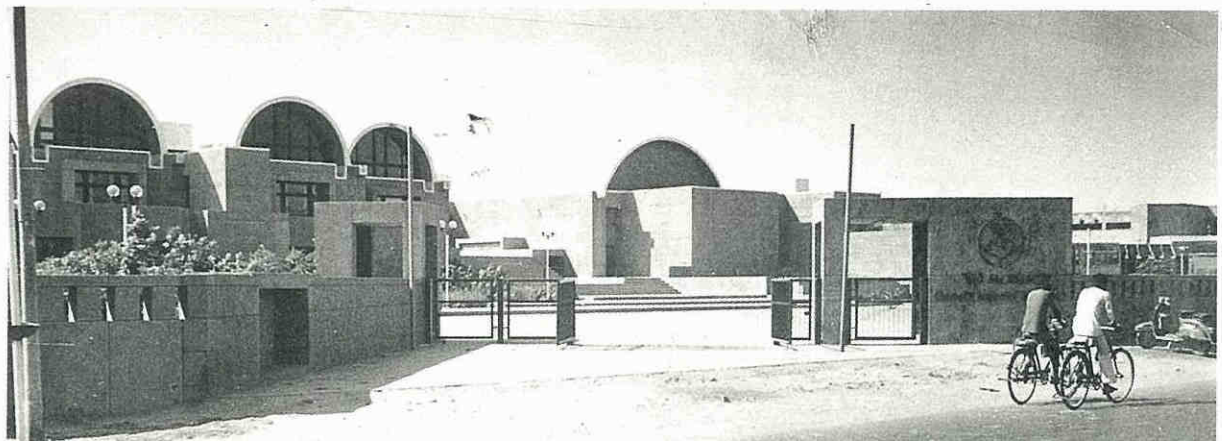
The plan of the building answers to the peculiar shape of the site. The nucleus of the configuration is a central court around which all the academic and administrative areas are wrapped. By articulating the plinth and relating the building to the ground, the architect has incorporated characteristics commonly associated with sacred buildings. An attempt has been made to give the feeling that the institute is easily accessible to the public. Access with reverence is made possible by breaking the surfaces. These aspects of accessibility and respect, besides being a response to Ahmedabad's hot and humid climate, form the main theme of the design.

The Institute houses a library, an auditorium, an exhibition space, teaching areas, offices and an attached students' dormitory. The academic wing is arranged along a circulation spine which serves as an exhibition space at the first level. The vaults are designed to echo the outlines of Buddhist *chaitya* arches or Bengali curved roofs. The approach is along a diagonal which traverses the entrance court prior to climbing a wide flight of steps. Entry is provided at the first level. The interior route is designed to give unexpected vistas and experiences. There is also a variety of open-air spaces, terraces and covered walkways. The spaces are designed to flow freely into one another.

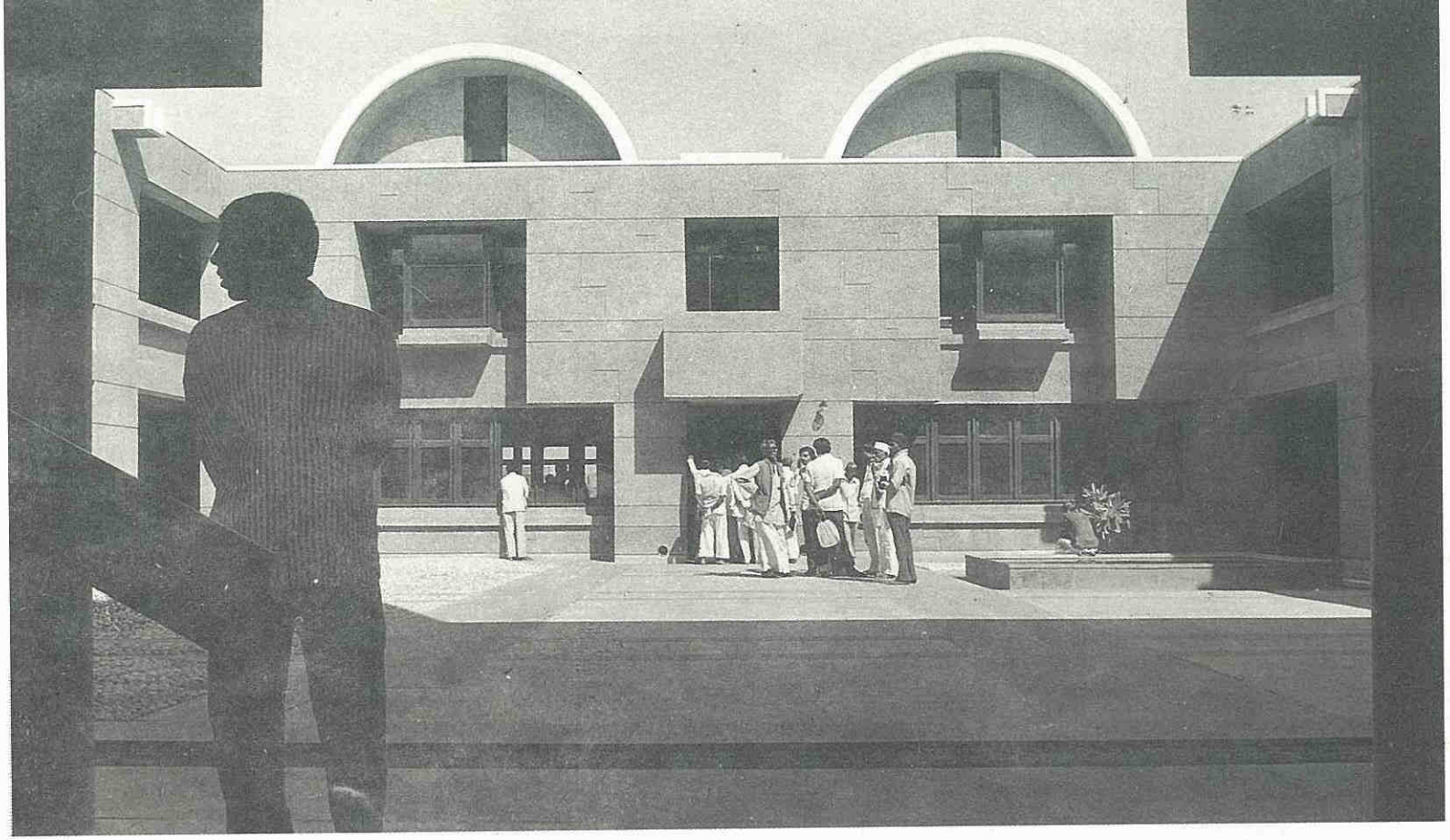
The structure incorporates the use of reinforced-concrete posts, beams and slabs with cavity vaults on the upper floors. The vaults are finished with a mosaic of waste glazed tile-pieces.



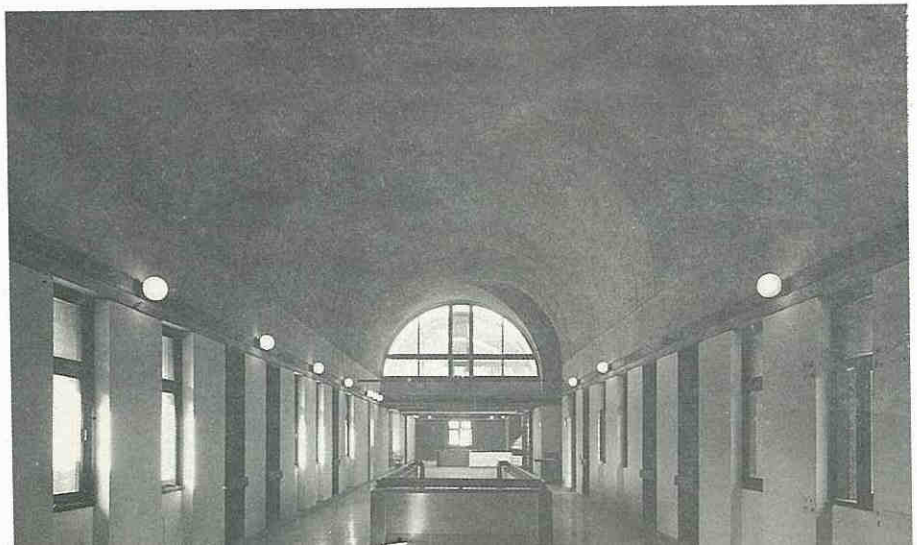

Gandhian sense of history in Doshi's architecture



Mood setting views:
Respect for complex walkers



Healthy architectural blood pressure: Creative circulatory arteries



Evolution of architectural arithmatic: Onto massive vaults

## BAHA'I HOUSE OF WORSHIP, NEW DELHI (1980-86)

*Architect:* Fariburz Sahba, Haifa.

The Baha'i House of Worship, located on a 9.7-hectare site near Nehru Place in South Delhi, is a place of worship open to people of all races, religions and castes. The form of this House of Worship takes the shape of the lotus, a flower considered sacred by most Indians. It is designed to reflect the simplicity, clarity and freshness of the Baha'i Faith and to act as a symbol of the unity of mankind and religions.

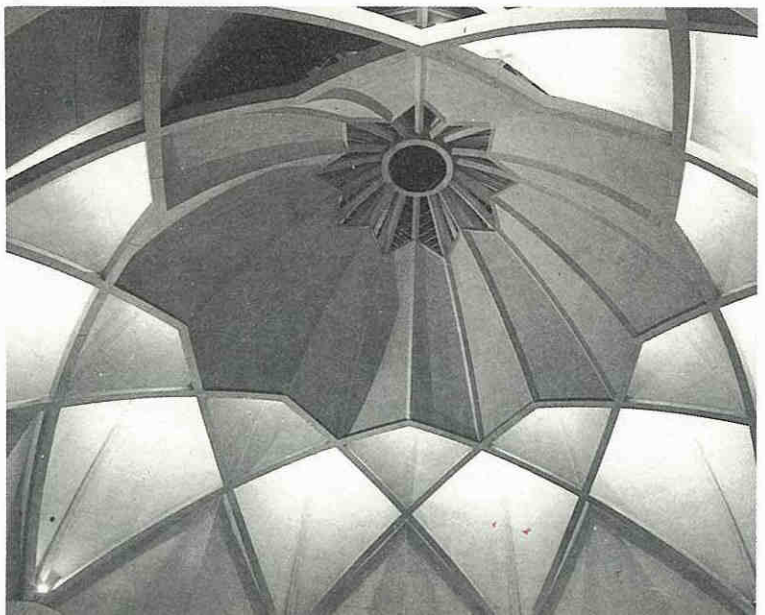
The architect, being a foreigner, has attempted to make this building familiar and acceptable to the Indian people without imitating any of the existing architectural schools of India. The basic idea of the design is that two fundamental elements—light and water—have been used as ornamentation in place of the statues and carvings normally found in Indian temples. The structure is composed of three ranks of nine petals each, springing from a podium which elevates the building above the surrounding plain. The first two ranks curve inward, embracing the inner dome, while the third layer curves outward to form canopies over the nine entrances.

The double-layered interior dome, modelled on the innermost portion of the lotus, comprises 54 ribs with concrete shells in between. The central hall has a diameter of 34 metres and a height of 33.6 metres above the podium. It is ringed by nine arches which provide the main support for the superstructure. With a seating capacity of 2,200 the hall has no idols, no photographs and no priests. Besides the main hall, the complex consists of an ancillary block with a reception centre, a library and an administrative office.

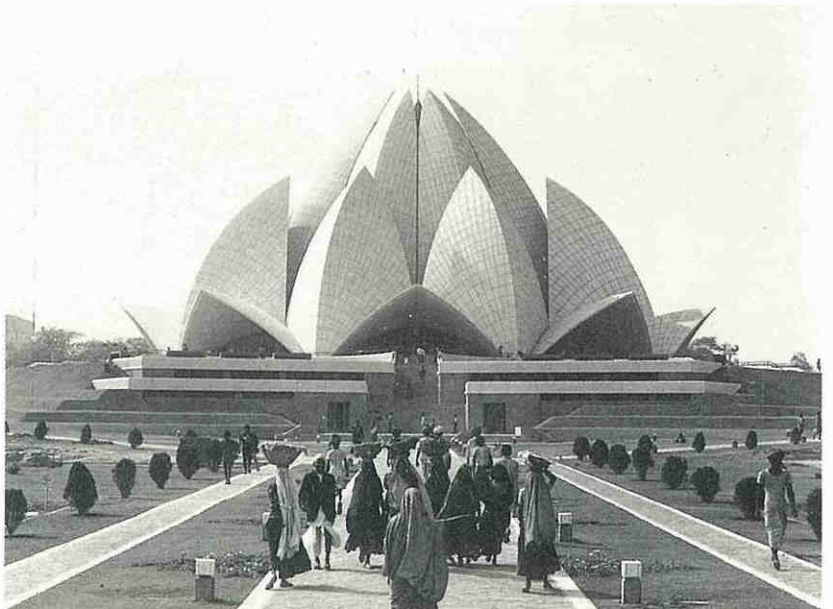
The entire superstructure is designed to function as a series of skylights with glazing at the apex of the inner petals, underneath the outer petals and on the external side of the entrance petals. Light thus filters into the central hall in the same way as it passes through the lotus flower. Nine reflecting pools surround the building, their form suggesting the leaves of the lotus. External illumination is so arranged as to make the lotus structure appeal floating on water. The building embodies effective ventilation and cooling techniques. Fresh air, cooled as it passes over the fountains and pools, is drawn in through openings in the basement up into the central hall and expelled through a vent at the top of the structure.

The reinforced-concrete petals are clad in white marble panels, done to fit the surface profiles and to patterns related to the structure's geometry. White marble also covers all the interior floors, while the insides of the petals are bush-hammered concrete. The walkways and stairs in the podium are finished in local red sandstone.

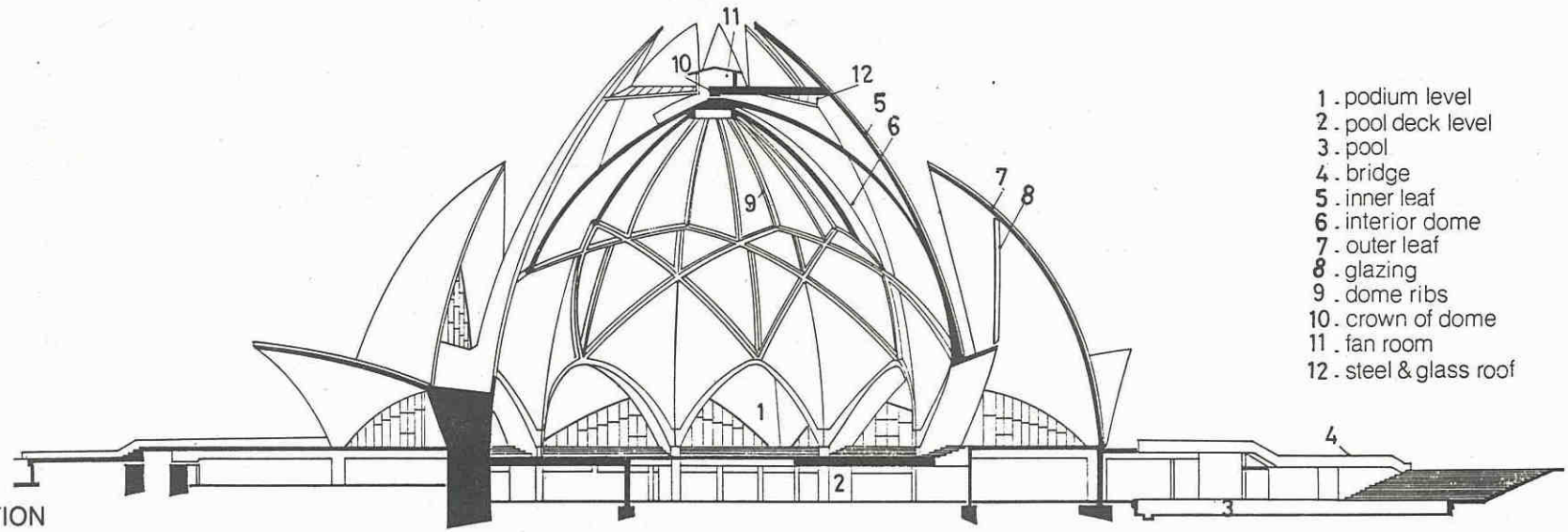
Celestial light on heavenly abode



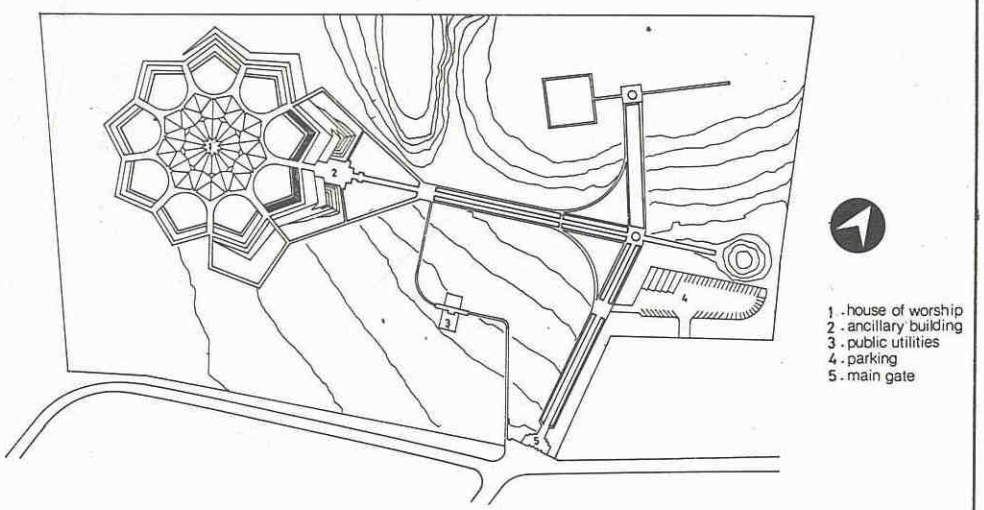
Entering His kingdom on earth



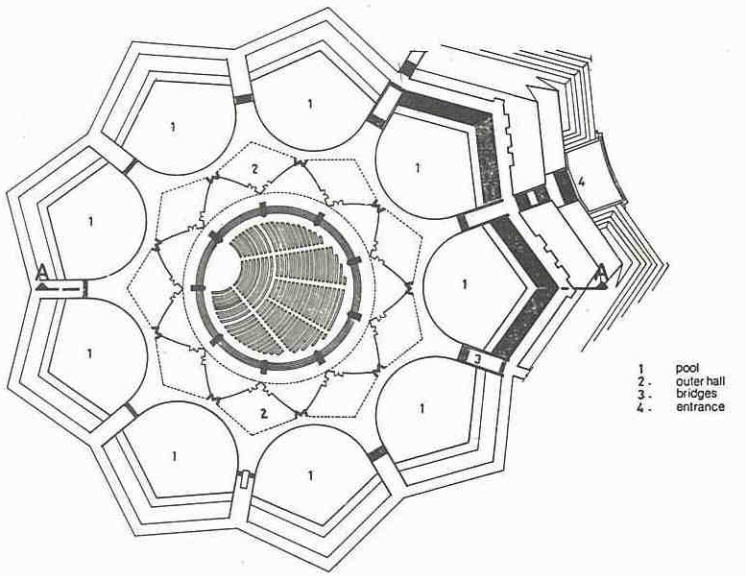
Devine geometry



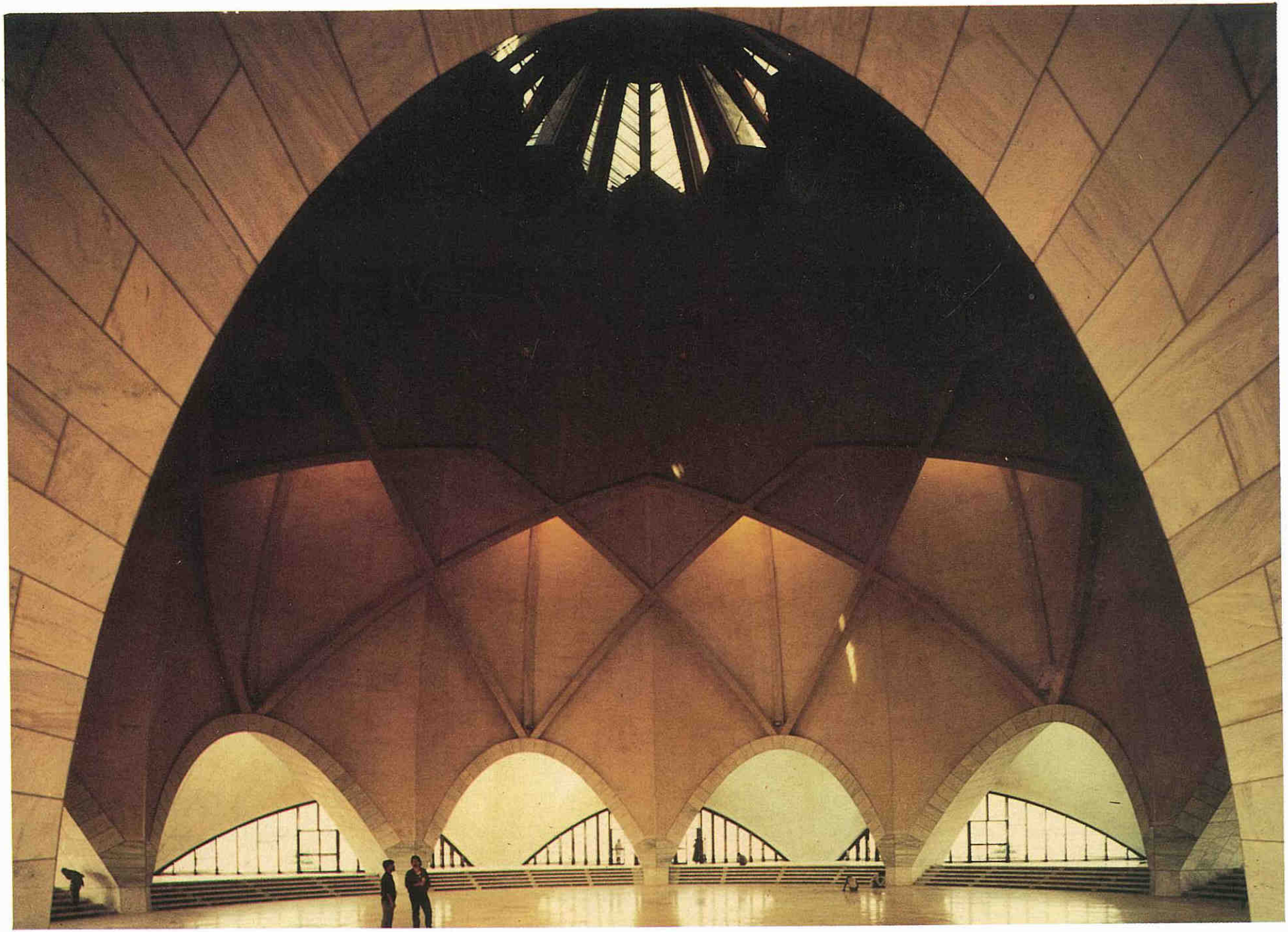

SECTION




SITE PLAN




PLAN



Inner hall of inner search

## MAJORDA BEACH RESORT, GOA (1980-89)

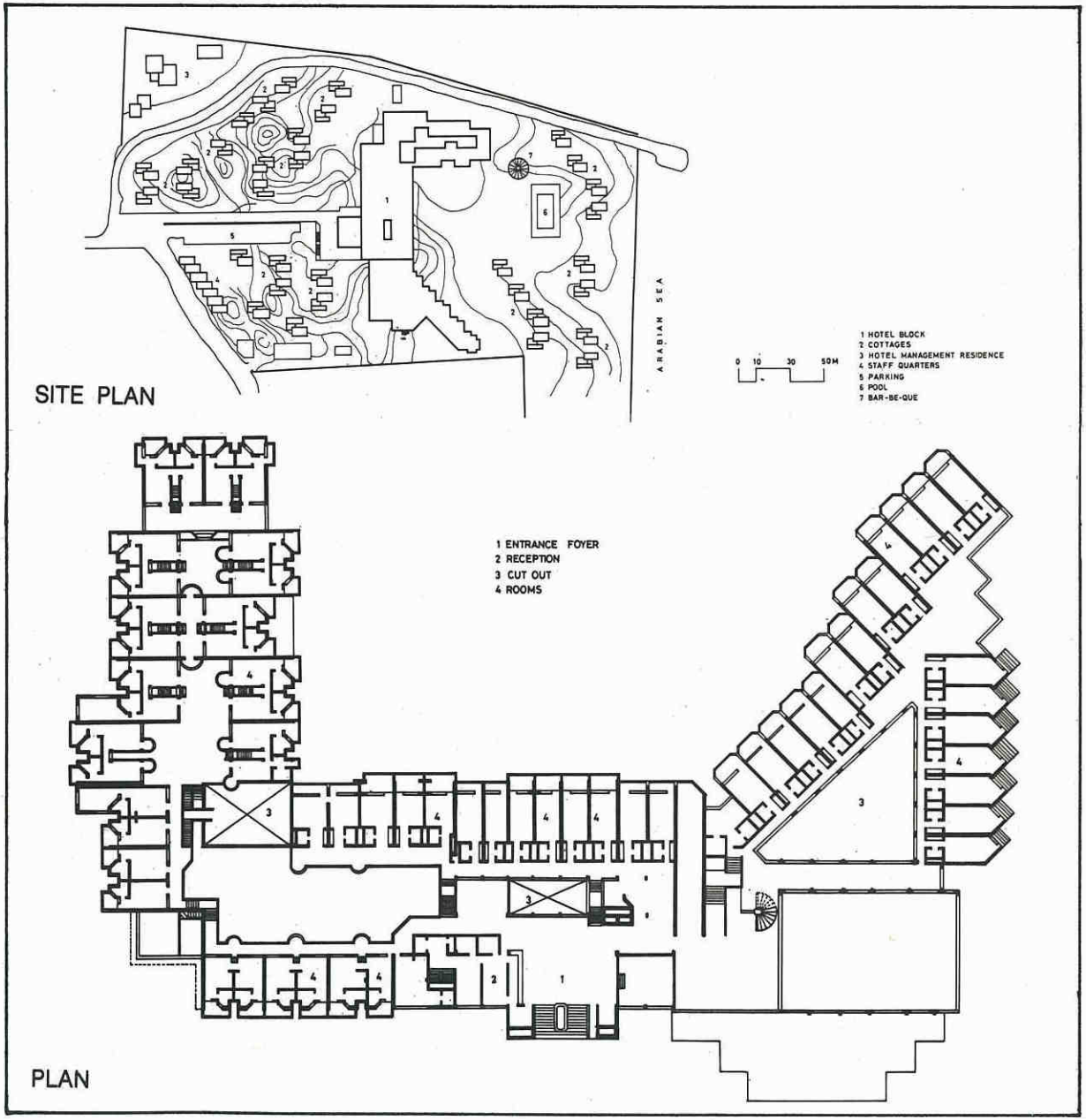
*Architect:* Sachdev Eggleston Associates, New Delhi.

The Majorda Beach Resort with 9,500 square metres of floor area, is located on a white, sandy beach about 15 kilometres south of Goa airport. The total area of the site is 2.5 hectares. The surrounding areas have a typical mix of coconut plants, paddy fields and traditional Goan buildings.

To endow it with a definite sense of place and time as well as an ambience in keeping with the context of the region's culture, the architect has made an attempt to blend traditional Goan elements with new technology and a modern way of life. The external expression of the buildings represents modernism, whereas influences of the local traditions are extensively visible in the detailing of the interiors. The shape and location of the site have dictated the design and layout of the different structures.

A long ramp provides access to the hotel. This ramp leads to a raised lobby, built around a heavily decorated central pillar. A "street" is created within the building with rooms leading off into small courtyards, overlooking both the interior and the outside. Murals and paintings, designed to depict the local culture, adorn the walls in the "village street" Two swimming pools are provided so that these can be used round the year. The roof folds of varying heights and widths are so designed as to echo the sea waves. Independent cottages are informally located to provide separation and privacy from the larger mass of the hotel building.

The buildings have a reinforced-concrete frame with brick in-fill walls. The external surfaces are finished in stucco. Clay tiles are used for the roofing.



Dialogue between Goanese and modern architecture: Inner view

Gaiety galore: In sympathy with Goanese culture

Architect's respect for natural setting: A bird's eye view of the Hotel

## SCOPE OFFICE COMPLEX, NEW DELHI (1980-89)

*Architect:* Rej Rewal Associates, New Delhi.

The SCOPE Office Complex is located in an office zone for governmental organisations, not far from the vicinity of Humayun's Tomb in South Delhi.

The office complex is designed for large autonomous public sector organisations sharing a few common facilities like an auditorium, seminar rooms and restaurants. Vehicular movement is restricted to the periphery of the complex, which has been divided into eight segments with distinct circulation cores. An attempt has been made to identify different office organisations around these cores. Each service core accommodates lifts, staircases and toilets.

The eight blocks, each of polygonal form, are interlocked around a central courtyard, which provide for diffused natural light and ventilation. On the external facade of the entire structure, the overhanging building mass on the upper floors obstructs the Sun's hostile rays and produces deep shadows. However, towards the internal courtyard, the blocks recess at different levels to provide protected terraces.

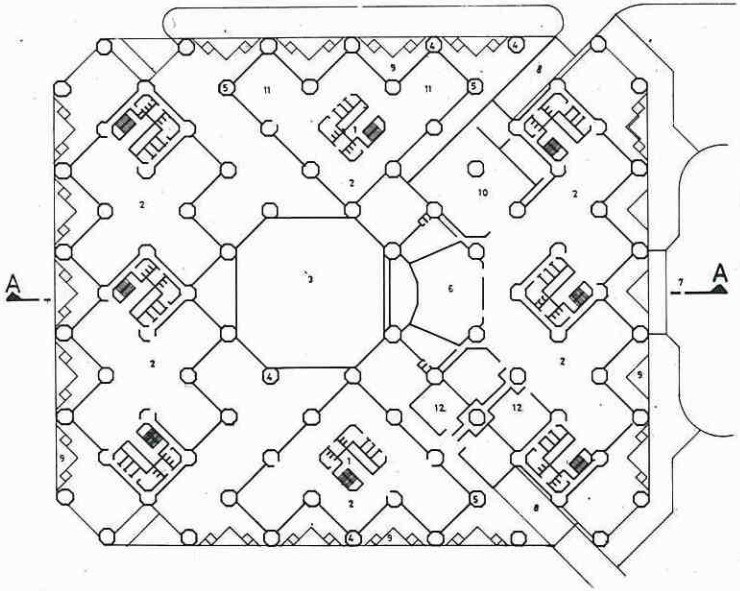
The form of the blocks is based on a multiple of a structural system and consequently it tones down the Sun's harsh rays. Deeply protected windows are designed to get an unobstructed view of the surrounding areas. A cluster of four columns on the facade of the building acts like a structural minaret and encloses airconditioning ducts and services. On the roof level, the building provides for a series of cafeterias.

In fact the terraced roofs assume the most important role of providing much-sought relief from the office environment. The scale and character of the parasols on the roof-garden, with a movement pattern alternating between shade and sun, provide a pleasant environment for about 7,000 office workers. The cafeterias are approached through the roof-garden by means of open steps and their elevated position ensures a splendid view of the surroundings.

The blocks echo some of the underlying values of Delhi's polycoloured red and beige historical buildings. A combination of the red and buff-coloured sandstone has been used for cladding the external facades of the blocks.

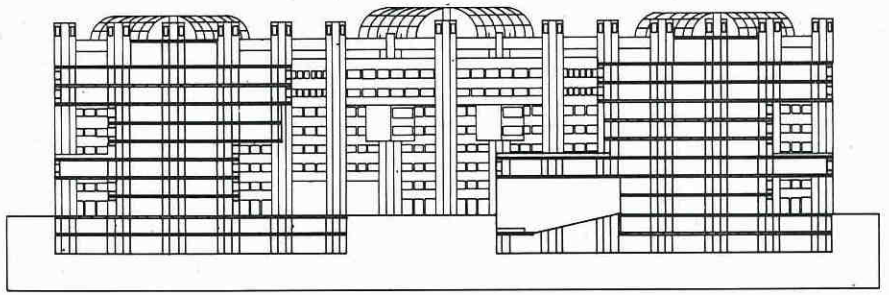
Central court

Interlocking modules

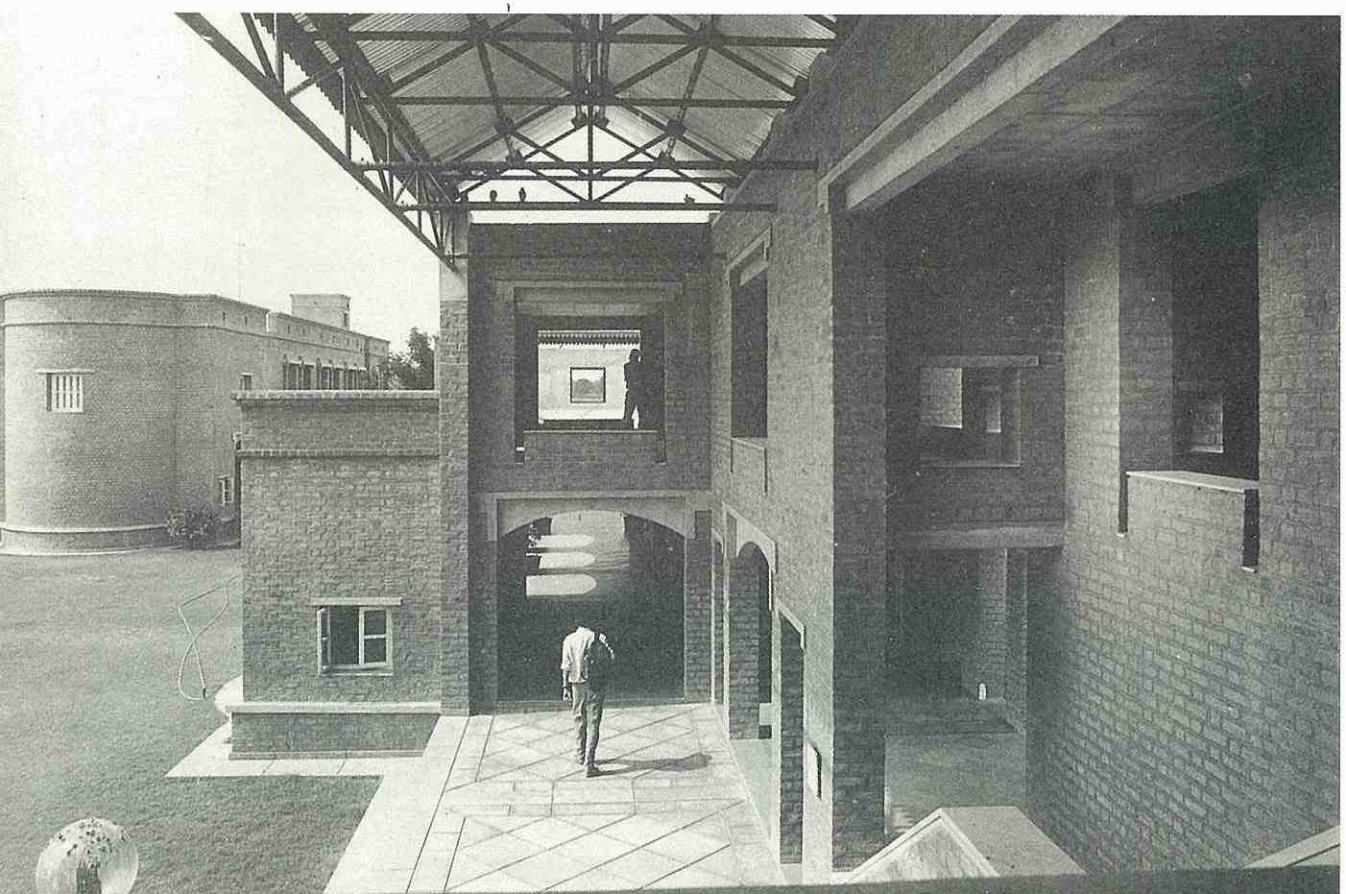



1 SERVICE CORE
2 OFFICE SPACE
3 CENTRAL COURT
4 SERVICE CLUSTER
5 FIRE ESCAPE
6 AUDITORIUM
7 PARKING
8 RAMP
9 ENTRANCE STEPS
10 RESTAURANT
11 CONE FACILITIES
12 SEMINAR ROOM

GROUND FLOOR PLAN



SECTION



Entrepreneurship Development Institute, Ahmedabad

# Section IV (1981-1991)

Low-Cost Housing, Vysankere
Hotel Le Meridien, New Delhi
Aranya Township, Indore
IIMC Students' Hostel, Calcutta
School of Architecture, Institute of Environmental Design, Vallabh Vidyanagar
Delhi Public School, NOIDA
Sri Dharamsthala Manjunatheshwara Institute of Engineering and Technology, Dharwad
Babylon Apartments, Calcutta
Mahindra and Mahindra Head Office, Bombay
Lakeside Holiday Home, Lonavala
Corporate Office Complex, Pune
National Institute of Immunology, New Delhi
SAIIER Primary School Campus, Auroville
Engineering College, Kota
Indian Institute of Foreign Trade, New Delhi
Garware House, Nasik

Entrepreneurship Development Institute, Ahmedabad
Indira Gandhi Institute of Development Research, Bombay
Planetarium Complex, Bangalore
Food Crafts Institute, Bhopal
Taj Bengal Hotel, Calcutta
Triveni Tirath Campus, Kalsar
Punjab Arts Council Building, Chandigarh
Swimming Pool, Panchgani
Commercial Complex, Trichur
Kufri Resorts, Kufri
Staff Housing, New Bombay
Centre for Development Studies and Activities, Pune
SOS Children's Village, Bhopal
Oakshott Place, Bangalore
Central Co-operative Bank Complex, Jalandhar
Officers' Flats, Patiala
NDDB Staff Housing, NOIDA
New Market Redevelopment Project, Calcutta

Rest House, Seoni
Bookwing Printing Press, Dantali
Indian Institute of Forest Management, Bhopal
New Howrah Station and Rail Yatri Niwas, Calcutta
CIDCO Public Housing, New Bombay
Youth Hostel, Ropar
Bharatiyam Gram, New Delhi
Jawahar Bhavan, New Delhi
Falcons Crest, Bombay
Titan Watches Complex, Bangalore
Church of God (Full Gospel), Chandigarh
Housing for Gas Victims, Bhopal
Eureka Tower, Hubli
Indian Institute of Health Management and Research, Jaipur
Headquarters of Bhopal Development Authority, Bhopal
Basant Avas, Agra
Information-Reception Centre, Auroville

## LOW-COST HOUSING, VYSANKERE (1981-83)

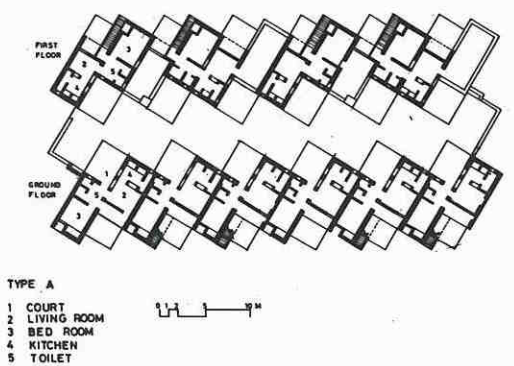
*Architect:* Kamu Iyer, Architects' Combine, Bombay.

The low-cost housing project was implemented at Vysankere, near Hospet in Bellary district of Karnataka. Spread over an area of 28 hectares, the site overlooks the famous Tungabhadra Lake and accommodates 580 dwelling units, in addition to community facilities like a health centre, market, schools, a bank, post office and a fire station.

The master plan consists of several clusters of housing blocks, bounded by roads on four sides. Each cluster has rows of houses either enclosing a central green space or terminating in one, with a particular kind of tree to identify the group of houses. To counter the high temperatures and dry climate of this region, the houses are oriented diagonally to the roads to catch the prevailing breeze. The streets are broken at certain intervals to create spaces for social interaction between the residents.

The concept of incremental housing was introduced. Thus the owner need not change his residence if his financial condition improves. With his growing needs, additional requirements can be met by making additions to the existing house. Thus, over a period of time, the basic 37-square-metres house could grow to 74 square metres, accommodating two more rooms without disturbing the layout. This generic house form eliminates the need to stratify the dwellings into different categories for various income groups. Although similar in size, two house types were planned because of certain site limitations. A-type houses are double-storeyed, whereas B-type dwellings have been kept single-storeyed. Both types of houses are grouped in such a way as to create an interesting skyline and enclosures.

The use of locally available materials and labour, adoption of simple precasting techniques for certain elements and close interaction between the clients, consultants and contractors helped in reducing the cost to a considerable extent. As it was difficult to grow vegetation due to shortage of water, the sewage and sullage is collected in septic tanks and treated waste water is then channelised to irrigate the green areas. By using several septic tanks, as opposed to a centralised area, the length of service pipes is reduced. Eventually the provision of a bio-gas plant will further augment energy conservation.




PLANS


SITE PLAN

Stairing the climb

Where staggering does not stagger

Modernisation of local materials

Local granite stones, set in lime mortar with sunk pointing, have been used in the construction of the load-bearing walls. Cuddapah stone slabs are placed on standardised precast concrete joists for the roofing. The windows and doors are made of local wood, without frames, and are painted in bright colours. The flooring has been done with Cuddapah stone slabs. The interiors are whitewashed. Slabs of granite are used as lintels for openings and are plastered. The external walls are a combination of exposed stone for the upper surfaces and plaster finish for those surfaces which come in direct contact with the users. The finish is in lime plaster and painted in red oxide and yellow ochre.

## HOTEL LE MERIDIEN, NEW DELHI (1980-87)

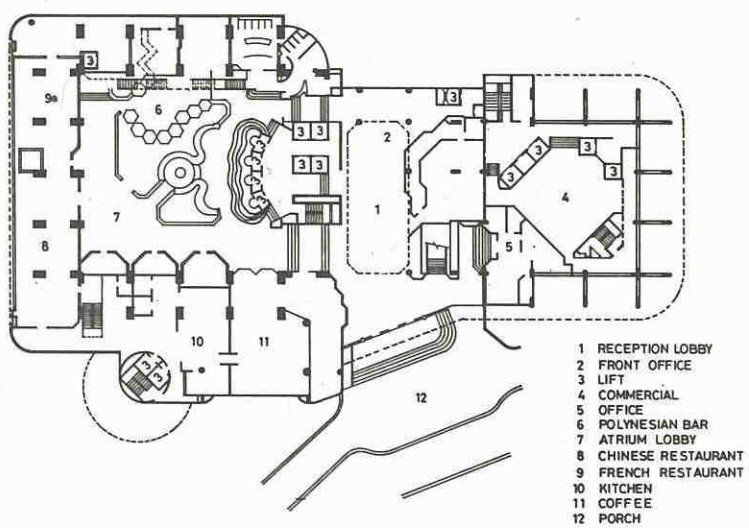
*Architect:* Raja Aederi Consultants Private Limited, Bombay.

The five-star Hotel Le Meridien is built on two hectares of land at the confluence of two major roads—Janpath and Raisina Road—in New Delhi. It is one of the new hotels which were expeditiously sanctioned to meet the demand anticipated for the Asian Games in 1982.

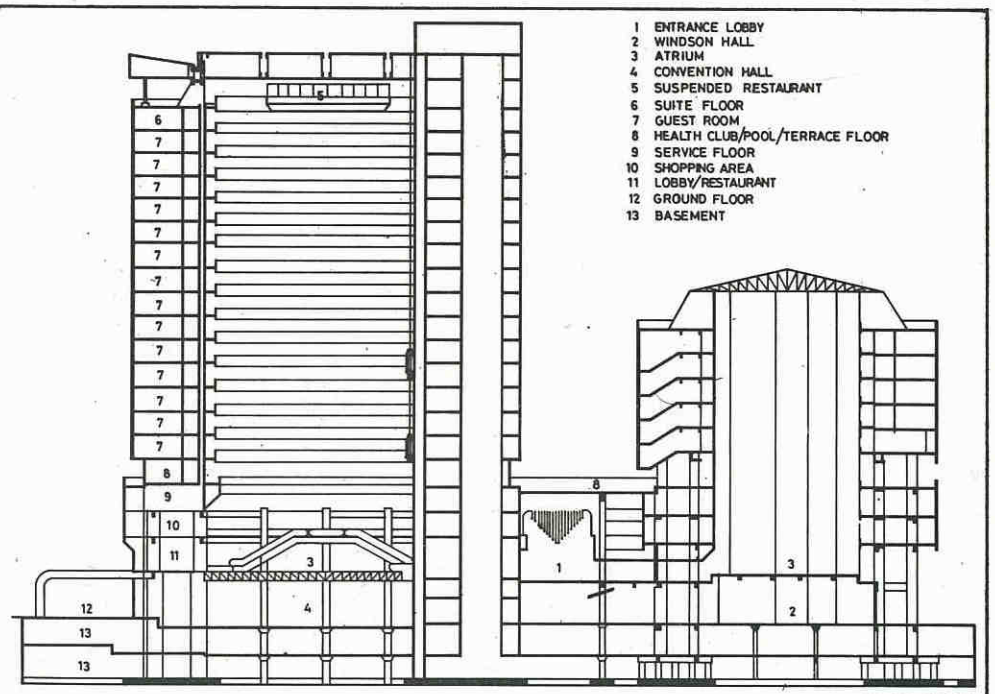
The design of Le Meridien is set to the cultural pulse of the times and the architect conceived of a certain aesthetic completeness which could be achieved through an ultra-modern building suited for the excellent location. A thematic sequence was then generated, threading architecture, the interiors and ambience into a scintillating weave. According to its architect: "There must be a sense of theatre—the form and shape must arouse psycho-emotional stirrings. It's like a stage set for public and intimate interlude; for relaxation, business and conventions."[16] Although the mirrored curtain walls go against the proclivity for stone among the cultural milieu of Delhi, the design is conceived to express materials and mood that belong to the futuristic environment and age. An attempt has been made to create an ambience that would appeal to both commercial travellers as well as tourists.

To create a sense of expectation, at the very entrance an elevated ramp leads to a porch at a 6-metre level. The black-granite floor of the reception lobby, with its large sculptural glass chandelier, leads to the capsule elevators. Once within the elevator, the capsule rises, travels upwards from a pool of gurgling water and slowly unfolds from changing vantage points the atrium at the heart of the hotel. The atrium is 67 metres high with light taken from the sides. The shops and restaurants opening into it heighten the effect of beehive activity. Corridors lined with rooms also look in, participating in the total scheme.

The simple overall plan has two square towers with rounded corners. The larger tower serves as the hotel, whereas the smaller one accommodates the commercial premises. A bowl-shaped swimming pool with a 22-metre diameter basks in the sun on the fourth floor of the hotel. A restaurant is approached by simple



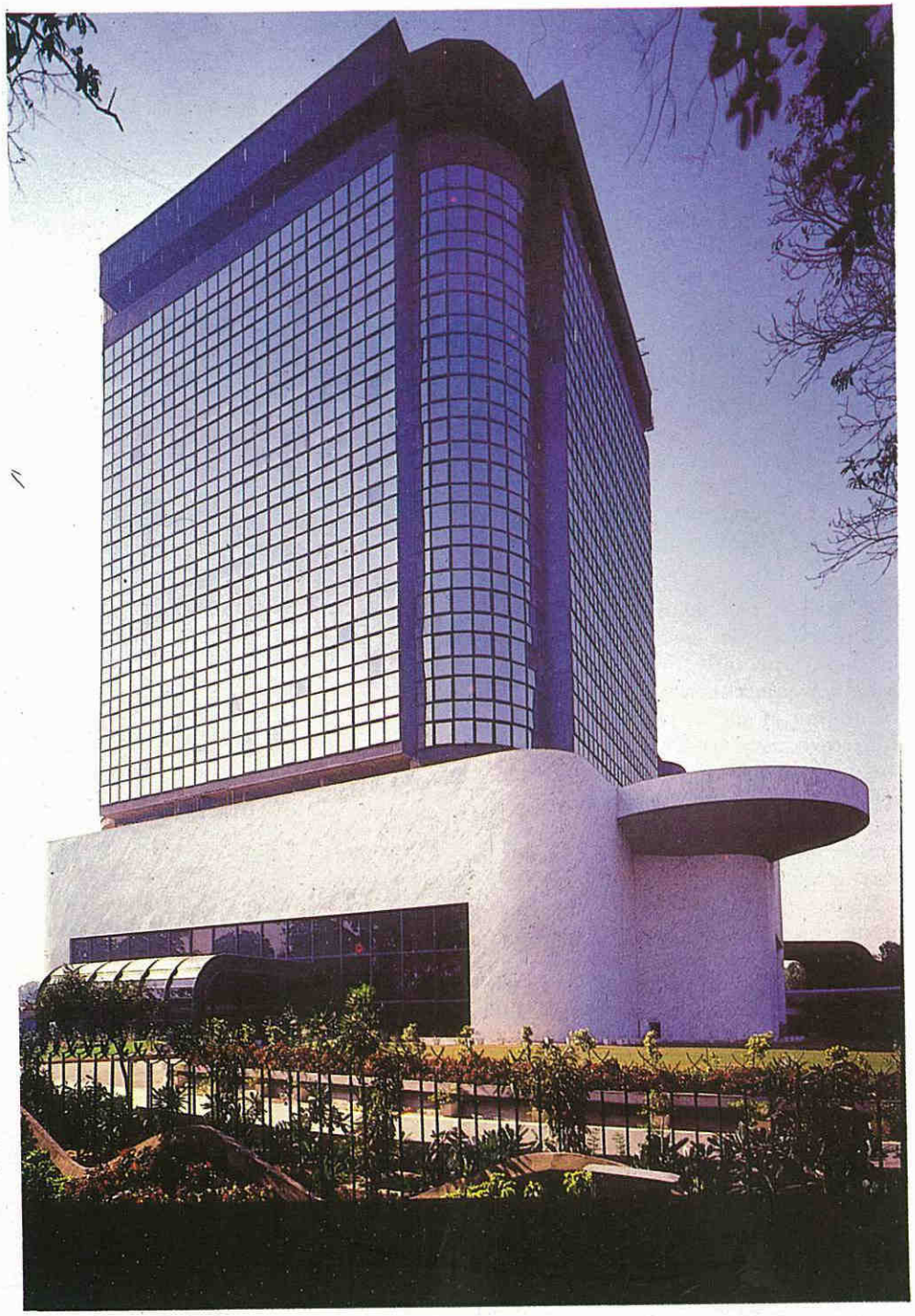

FIRST FLOOR PLAN




SECTION

bridges from all the four corners of the square and is suspended from the overlying roof truss. The tinted-glass curtain wall is used for the hotel block, with its exterior face in anodised aluminum. The hotel accommodates five speciality restaurants, a coffee shop, discotheque, business centre, bars and banquet and convention centres, besides, of course, five-star de luxe rooms.

Poetry of enclosing space



*Hotel Le Meridien, New Delhi* **143**

## ARANYA TOWNSHIP, INDORE (1981-1990)

*Architect:* Balkrishna Doshi, Vastu-Shilpa Foundation, Ahmedabad.

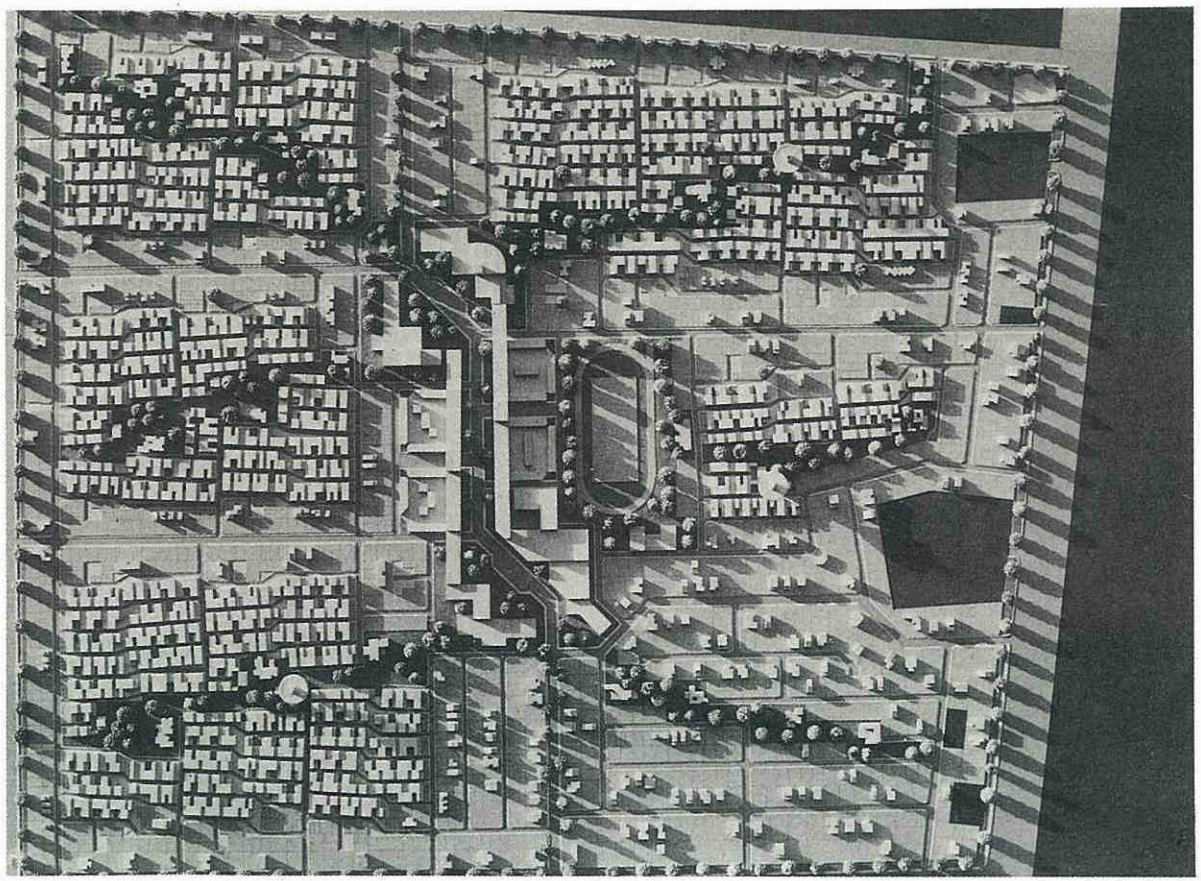
In order to ward off the acute housing shortage in Indore, the city's Development Authority initiated a low-cost self-help housing project with the assistance of the World Bank and the Housing and Urban Development Corporation. The 87-hectare site of Aranya Township is located on the Bombay-Agra highway, about 6 km north of Indore's City Centre. The township was planned to accommodate initially a population of 40,000, which is likely to rise to 70,000 eventually, thus achieving a gross density of 461 to 808 persons per hectare. The development scheme provides for 7,271 mixed-income housing plots, ranging in area from 35 to 475 square metres.

To bring down the initial capital investment and to use the scant and scarce resources optimally, a "site-and-services" approach was adopted, especially for the houses for the economically weaker sections of society. Incremental expansion of such houses by the occupants at their own pace and with their own resources has been allowed to stimulate the self-help principle within the community. To economise on the resources further, deep plots with maximum possible shared foundations and parting walls have been carved out, thus reducing the road lengths and service lines. Innovations in clustering patterns allow 20 toilets to be connected to a manhole, although most conventional schemes allow only eight. The service lines too serve four rows rather than just two.

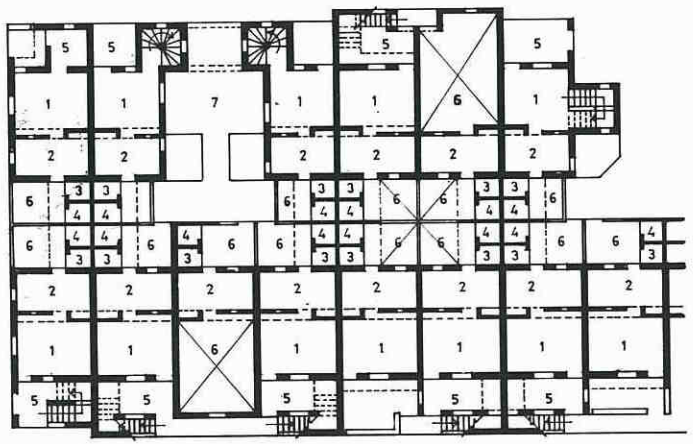
To create an integrated human habitat, compatible with the life-style and cultural background of the people, the architect has not only considered the economic aspect, marketability and spatial parameters, but also community living. The linear town centre is planned in the tradition of an Indian bazaar. The road network has been conceived in such a way that it connects the town centre but discourages traffic with staggers and twists. To highlight the spatial organisation, both roads and open spaces converge at the central spine.

A balanced mix of various income groups has been achieved by avoiding segregation. The plots are arranged in concentric rings. The bigger plots are kept at the periphery of each sector to provide vehicular access. The smaller plots are centrally placed along with public facilities and have pedestrian access. This clustering pattern reduces high density while encouraging social interaction. The township is planned on the principles derived from the architectural prototypes of squatter and traditional settlements and offers a wide range

Housing model

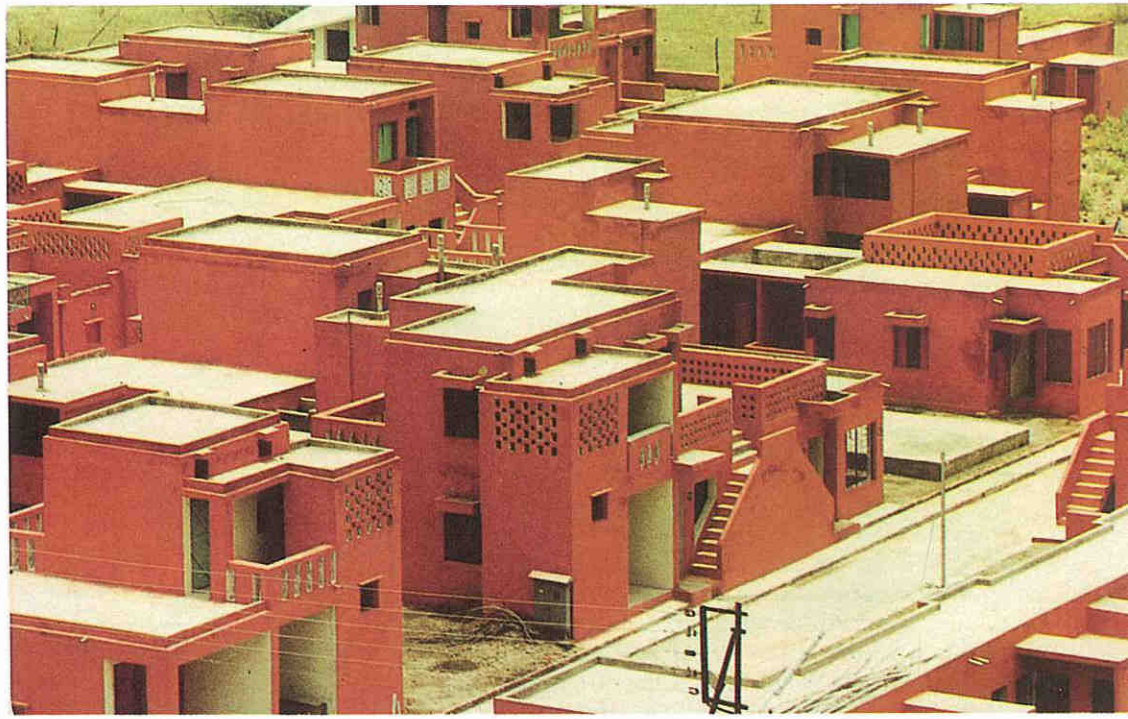


options to the users with respect to location, type of dwelling and basic form variations. These variations not only enrich the street picture but also enable the users to express their identity, which is fundamental to a healthy environment and its subsequent maintenance.



1 ROOM
2 KITCHEN
3 BATH
4 W.C.
5 VERANDAH
6 COURT
7 SERVICE SLOT

GROUND FLOOR PLAN



Multiple choice for owners

Architect helping those who help themselves

## IIMC STUDENTS' HOSTEL, CALCUTTA (1982-84)

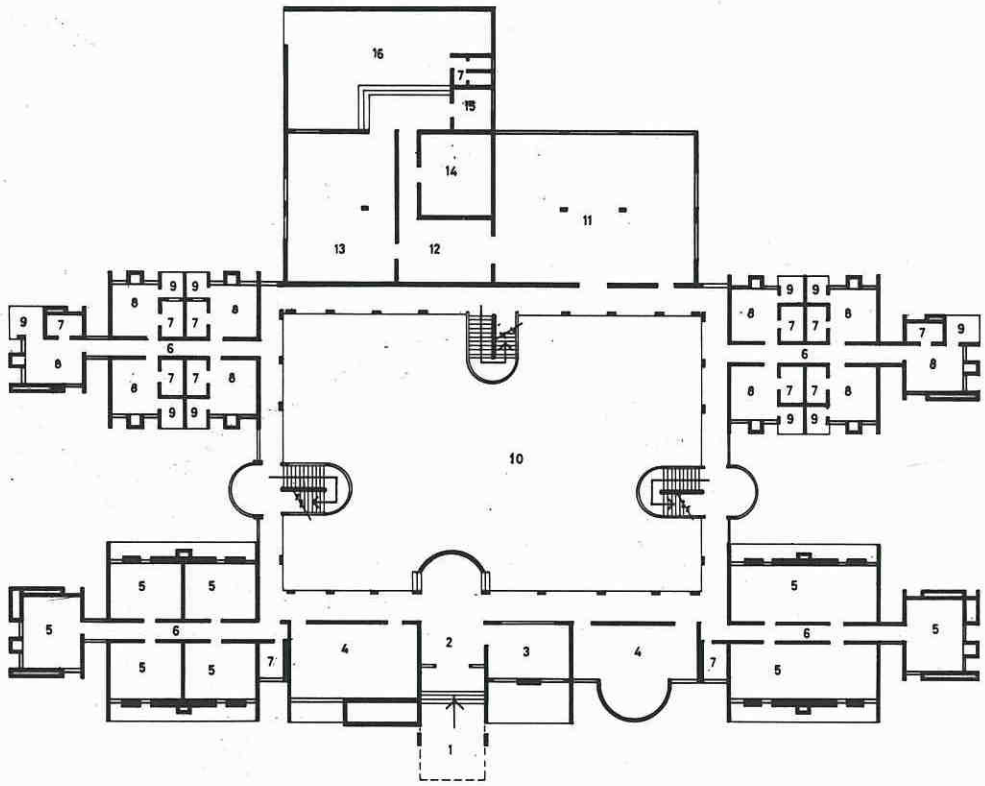
*Architect:* Sanon Sen & Associates, Calcutta.

The Indian Institute of Management's hostel for postgraduate students is situated amidst the lush green surroundings of Joka, 15 km from Calcutta. The total covered area of the building is 2,620 square metres.

Due to the hot and humid climatic conditions prevailing in the region, the concept of open planning was adopted. The building is designed around a large courtyard which serves as the focal point of the design. Cross-ventilation is an extremely important design aspect and as such the rooms have been so planned as to allow the free flow of air through them. In keeping with the existing structures, the design of the complex has been kept low-rise and is compact in order to minimise walking distances. The covered passages connecting the rooms and running around the central courtyard have been given large circular openings all along their length.

The hostel is designed to provide accommodation for 132 students. Each room is designed as a double occupancy unit, complete with an attached toilet and a small balcony. The ground floor has a spacious entrance lobby and visitors' room which also serves as a common room for the recreation of the students. There are also rooms for conferences and group discussions. Service areas include a large dining hall, kitchen and a courtyard for receiving provisions.

The building is a reinforced-concrete-frame structure with in-fill walls of brick masonry. The external surfaces are plastered and painted in yellow ochre. The flooring is in terrazzo with specific areas in ceramic tiles.




GROUND FLOOR PLAN

Discipline of repetitiveness

Openness defying humidity

# SCHOOL OF ARCHITECTURE, INSTITUTE OF ENVIRONMENTAL DESIGN, VALLABH VIDYANAGAR (1982-85)

*Architect:* Suryakant Patel, Sthapatya Kendra, Vadodara.

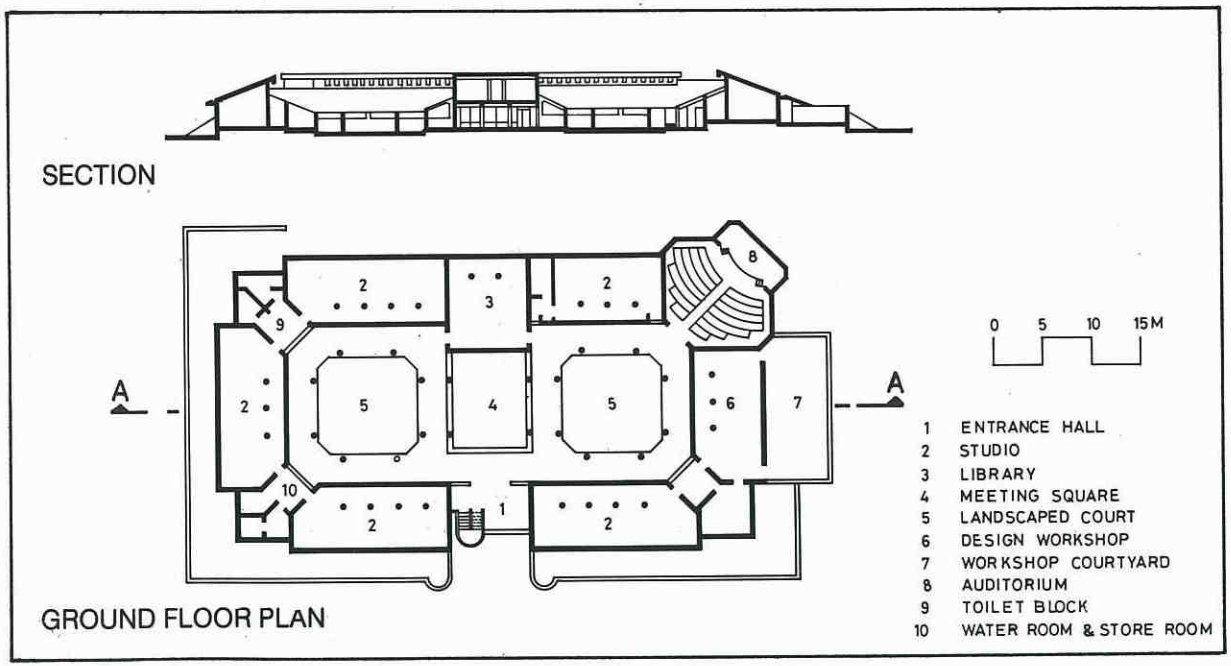
Located on a 4.94-hectare site near the Sardar Patel University Library in Vallabh Vidyanagar in Gujarat, the School of Architecture in the Institute of Environmental Design has 2,136 square metres of built-up area.

The architect's main objective was to create a structure which would provide a unique environment to inspire freedom of expression and, at the same time, provide privacy for study. An inward-looking design, with a low-profile structure, sloping roofs and open-to-sky courtyards in the interior, has been evolved to realise this objective. The built-form has been conceived to merge harmoniously with the landscape.

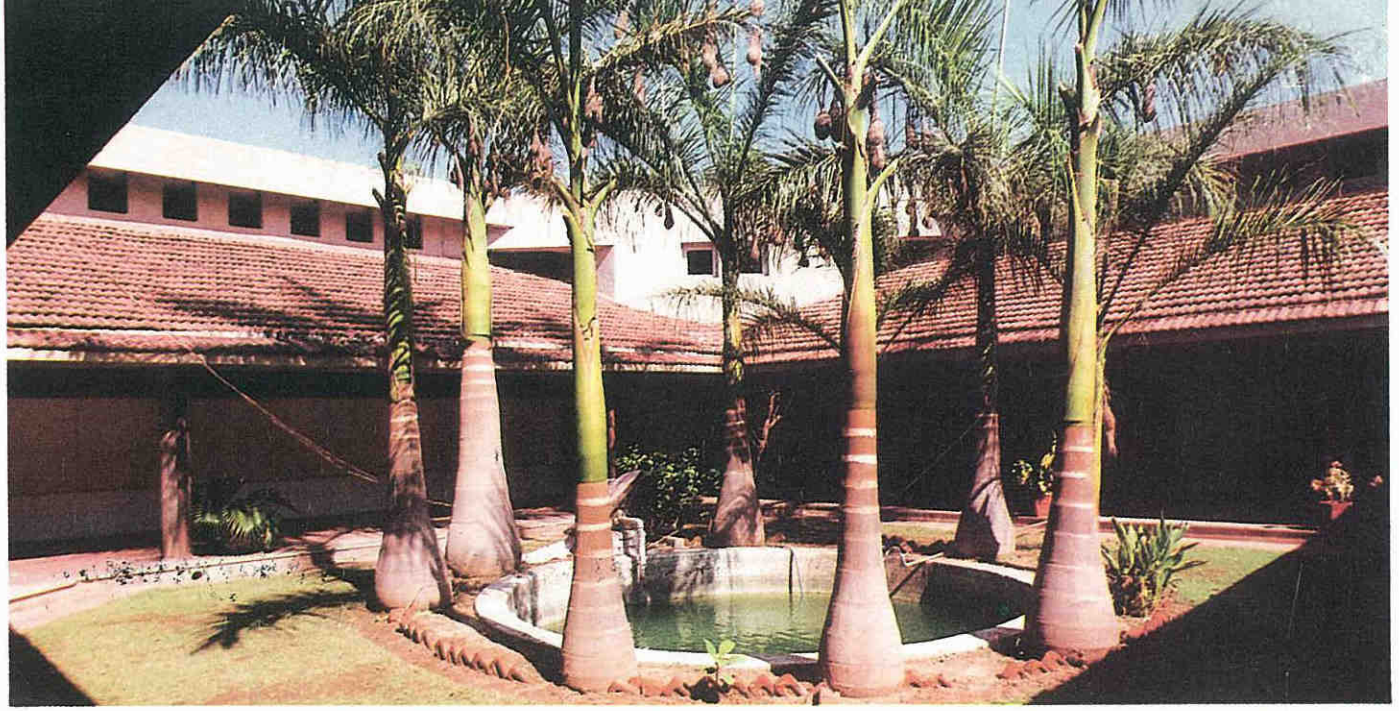
Six drawing studios open out into two landscaped courtyards. The two courtyards are separated by a central roofed-square, which is a core space and is extensively used for gatherings, meetings and social functions. The corridors are intentionally sunk in order to bestow the studio areas with privacy and at the same time to give an unobstructed view of the courtyards. The walls of the corridors are conceived to serve as display panels for drawings of students and other exhibitions. Small windows with deep overhangs adorn the studios, which are designed to provide adequate ventilation and much-needed diffused light. All the studios have been left without doors. This visually adds to the overall spirit of openness in the built-environment. Besides, it has been a cost-saving device.

The teaching and administration areas are segregated. The ground floor accommodates studios, workshop, library, etc. The administration wing, which comprises the principal's office, general office, a staff room for faculty members, lounge and a committee room, is on the first floor.

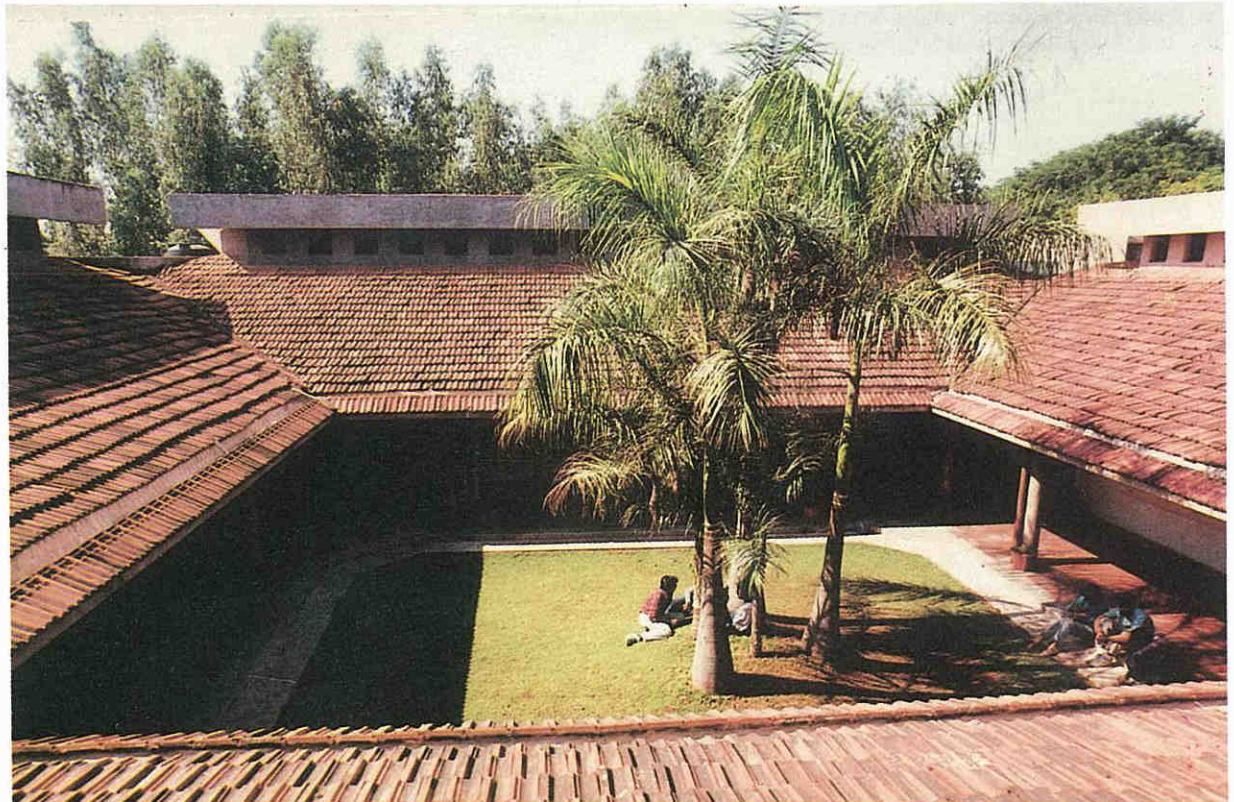
Architects entering through new architecture



Architectural challenge of flora



Tradition for modernists



Reinforced-concrete has been used for the columns, beams and slabs. The brick walls have been left exposed on the outside, while the interiors are plastered and painted. The sloping roofs are covered with Mangalore tiles.

## DELHI PUBLIC SCHOOL, NOIDA (1982-88)

*Architect:* Sikka Associates, New Delhi.

Simple is beautiful

Delhi Public School's complex at NOIDA, a developing township near Delhi, has 15,400 square metres of built-up area spread over a 6-hectare plot.

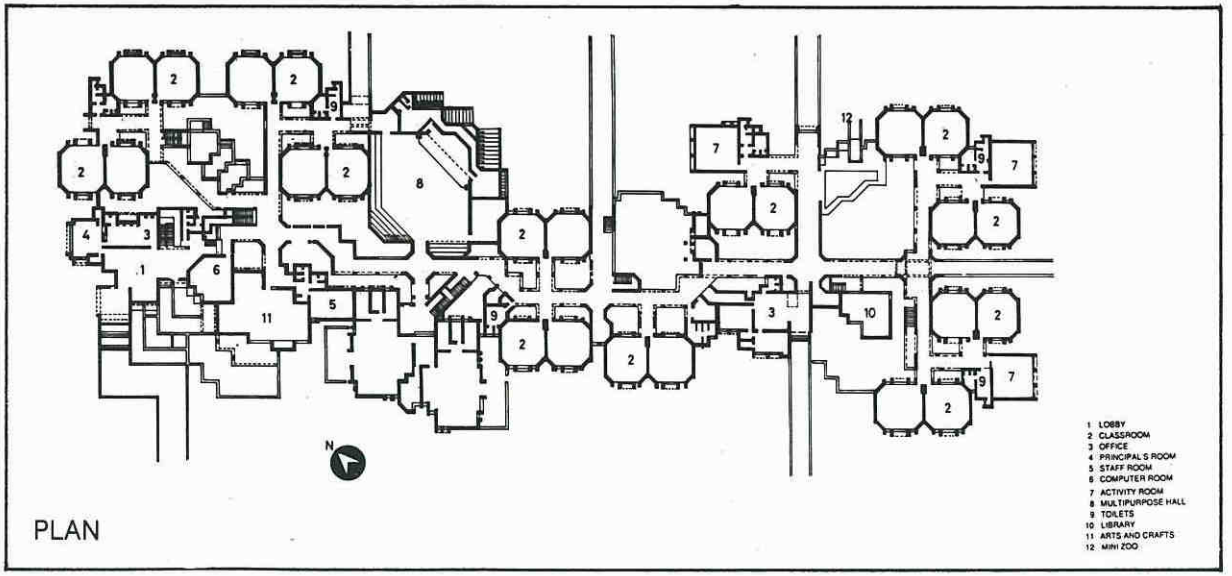
The primary intention of the complex's design is to create a conducive environment for learning and character building. This has been made possible by providing a playful environment for junior children, gradually growing into a sophisticated arrangement for senior students and at the same time maintaining the desirable formality in planning.

Efforts have been made to keep the academic area away from the noisy traffic artery in front. The entry points for the students are from a side road, thus insulating them from heavy vehicular traffic. Besides, the activities of the students are restricted towards the rear, and the front landscaped open space remains a pleasant foreground to serve as an entrance for visitors.

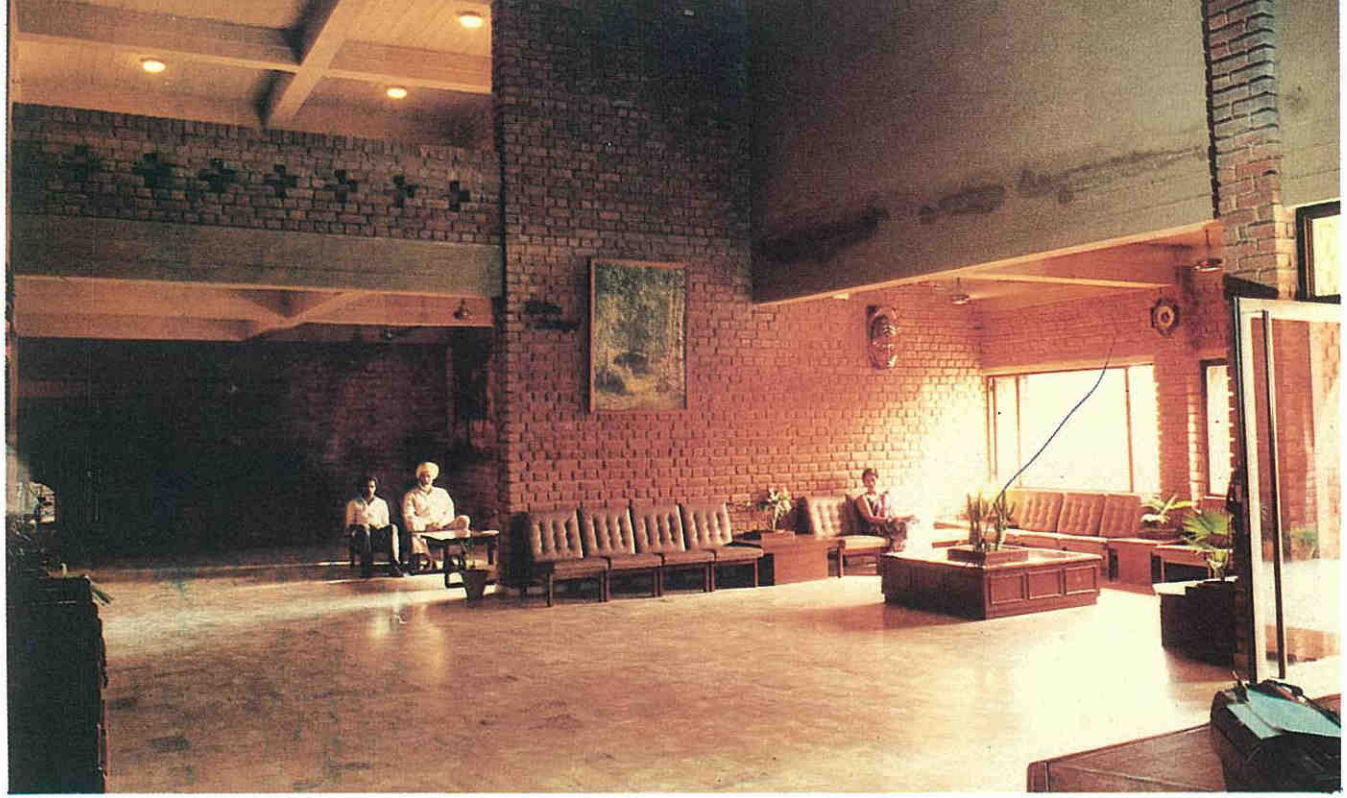
In addition to the usual academic requirements such as classrooms, laboratories and a library, amenities like an athletics track, open-air stage, swimming pool, multipurpose hall and work experience block have been incorporated on the campus for extra-curricular activities.

The variety of visual experience, while moving from one area to the other through informally laid corridors and landscaped courts, is amazing.

The classrooms are placed in such a way that each classroom has windows both on the north and the south sides. Classrooms abutting into corridors have been avoided to eliminate distraction due to movement. Abundant natural light and ventilation at the body level have been ensured.

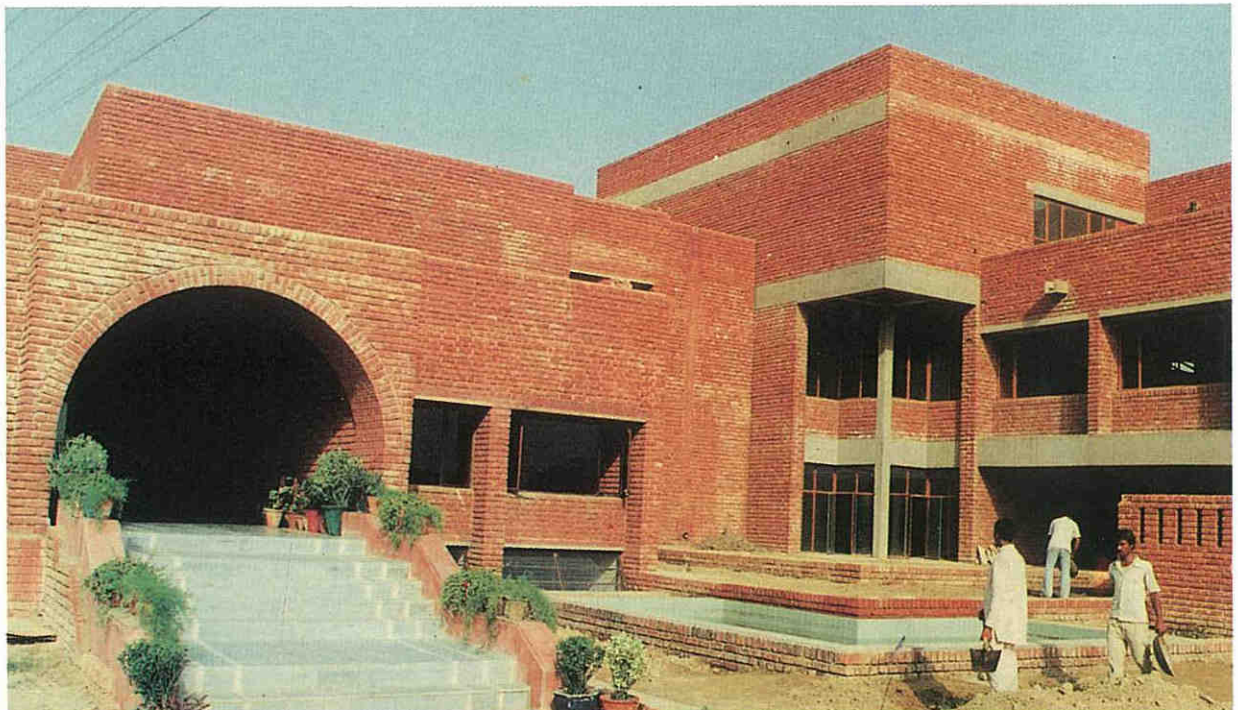




PLAN



Inside: Material exposure continuity

Squeezing beauty out of brick



The structure of the main school building was designed to be a four-storeyed building ultimately. It is a composite structural system with load-bearing brick walls. Columns and beams of reinforced concrete have been used where necessary. The entire exterior has a natural exposed brick finish, which has helped in maintaining visual uniformity and continuity.

## S D M INSTITUTE OF ENGINEERING AND TECHNOLOGY, DHARWAD (1982-86)

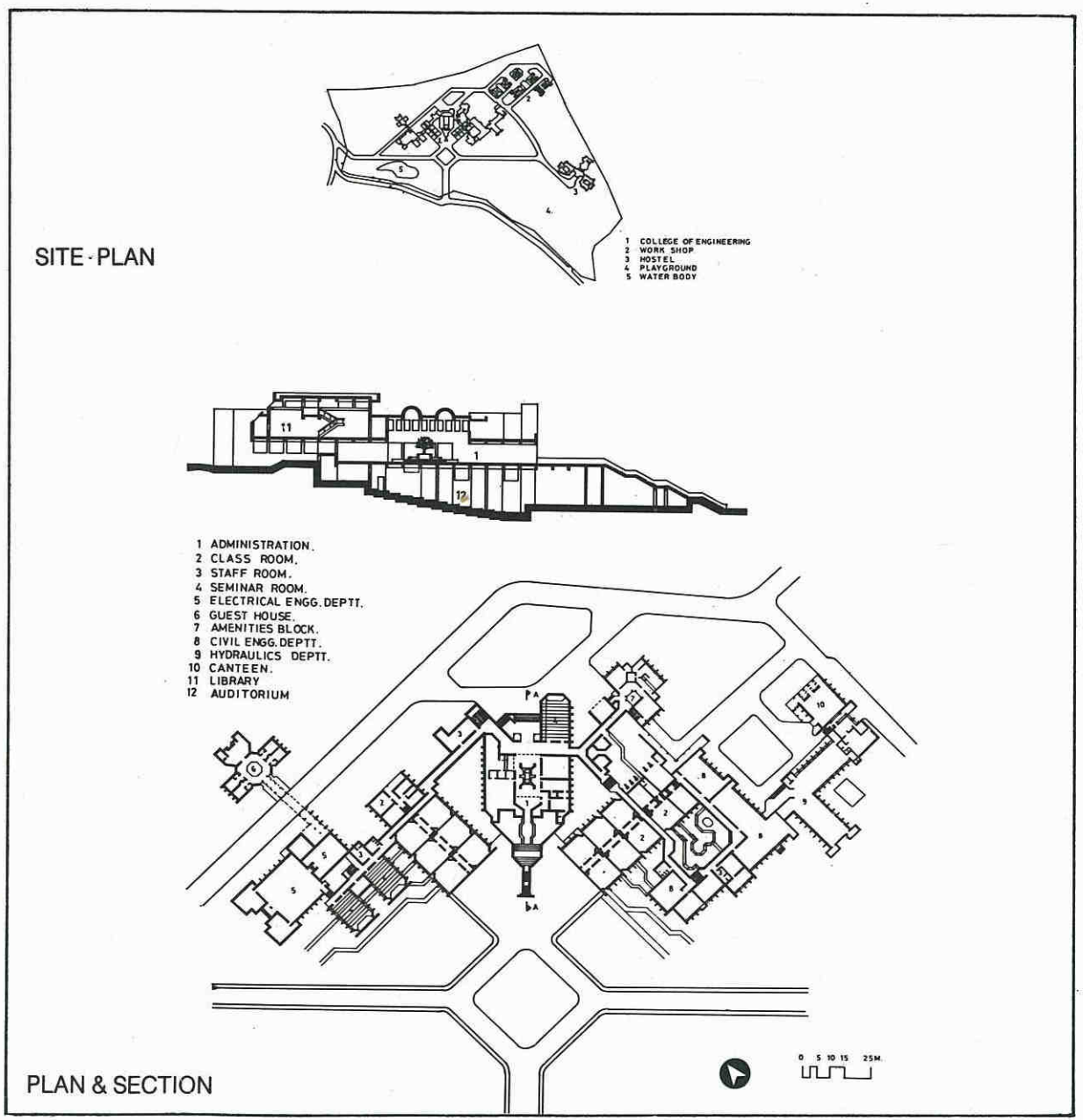
*Architect:* Shirish Beri, Kolhapur.

The Sri Dharamsthala Manjunatheshwara Institute of Engineering and Technology in Dharwad in Karnataka comprises primarily three blocks—a college, workshops and hostels—and is situated on a 16-hectare piece of land on the outskirts of the town. The site has a unique topography, basically the configuration of a half bowl with some relatively flat land on the ridge and the valley. The complex has a built-up area of 20,650 square metres and has been designed to exploit the topography of the site and to promote interaction between the users.

The college is located along the bowl slopes and is so designed as to minimise digging and filling of earth. The workshops and the hostels are located away from the college on the eastern fringe of the site.

The central portion of the college consists of administrative offices on the first level, an auditorium with a seating capacity of 1,000 on the ground level and a library on the second level. It has two entrances—one with a large landscaped mound, rocks and two water features on the north-eastern side and the second, a ceremonial entrance, on the south-western side. Both the entrances converge in a spacious, double-height lounge with fibre-glass skylight domes and built-in seating around the landscaped feature.

On either side of this central portion are classrooms, drawing halls, departmental laboratories and offices. The staff rooms are spread out at different locations to facilitate better control and proximity to the various departments. For promoting interaction between students and faculty members, wide passages with built-in seats have been provided. Well carved-out landscaped courts serve the same purpose. Efforts have been made to let in glare-free natural light into the classrooms and the library.



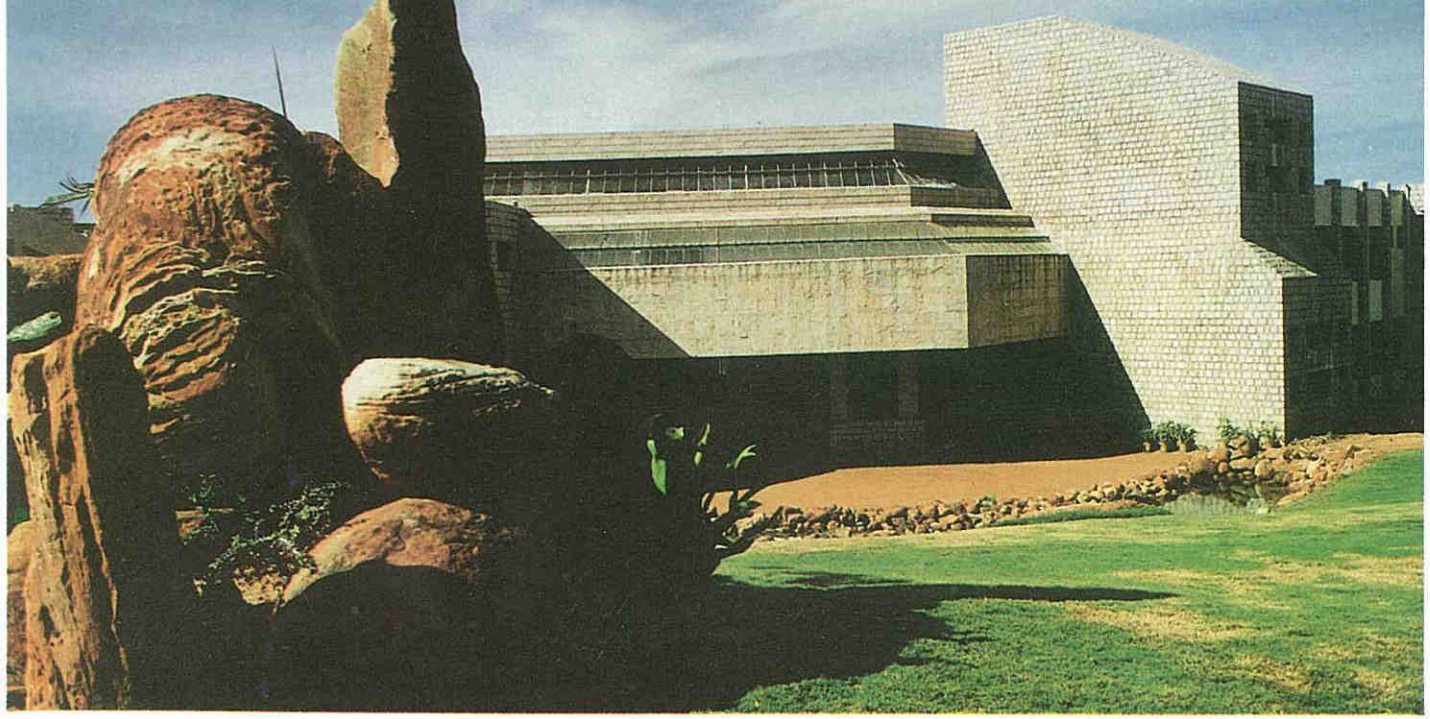
Fenestration is so designed as to get a view of the rolling hills outside and is well protected with thick masonry piers on the sides and roof-overhangs above. A central water reservoir, essentially a sump, is placed on a hillock along the northern boundary and merges with the landscape around.

The basic structural system is composite, with load-bearing stone and brick masonry walls, and partly a frame structure with reinforced-concrete columns and beams.

In command of order

Celebrity of entry

In the lap of Nature



Technocrats' artistic courtyard

Respecting site anatomy

Excitement of structure

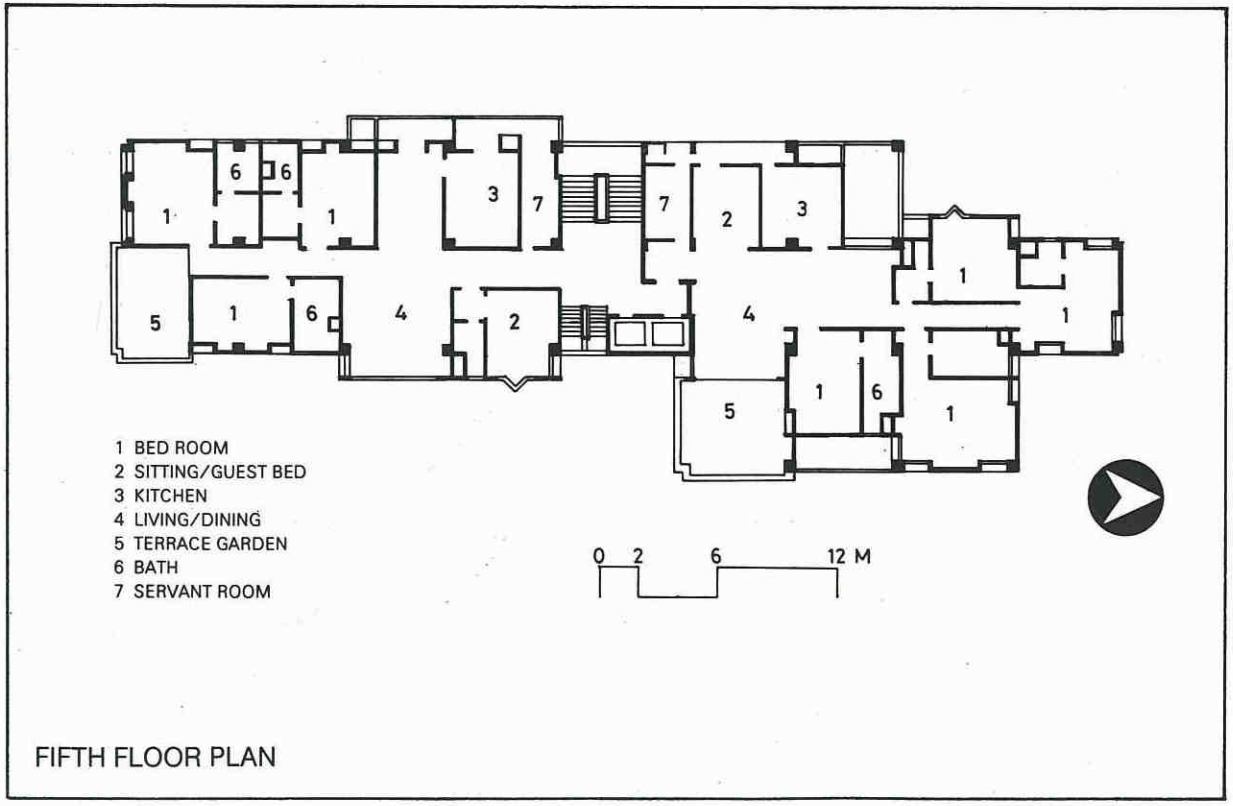
## BABYLON APARTMENTS, CALCUTTA (1983-87)

*Architect:* Dulal Mukherjee & Associates, Calcutta.

The high-rise Babylon Apartments are located on a linear strip of land in New Alipore, an elite neighbourhood of Calcutta. The apartment block covers an area of 2,322 square metres, abutting Burdwan road. The block with 71,582 square metres of built-up area, is designed to embody local imperatives like exposure to the south and cross-ventilation because of the humid climate.

The narrow frontage of the plot permitted only three bays breadth-wise. An attempt was made to tackle this problem with the interplay of forms, details and set-backs. The plan is evolved on a module of 27 squares, giving the structure numerous set-backs, recesses, protrusions and cut-outs. Each floor defies standardisation and has an identity of its own. To capture the ambience of the sprawling lawns of Alipore, each apartment is provided with a terrace garden. The staggered terraces facing the southern and eastern sides on each floor offer desired privacy and greenery. The plants and creepers on different levels have helped in toning down the harsh lines of the building.

High-rise view from terrace




FIFTH FLOOR PLAN

Each floor consists of two flats. Each apartment has a 268-square-metre floor area and contains five bedrooms, a living-cum-dining room, a kitchen, a servant room, besides toilets. The rooms have been carefully designed so that the structural columns do not intrude into the spaces. Certain common facilities are provided on the ground floor. The building has a reinforced-concrete frame.

Missing links miss nothing: Gaps to fill the whole

Unfolding new drama of architecture: architectural relief in high-rise structure

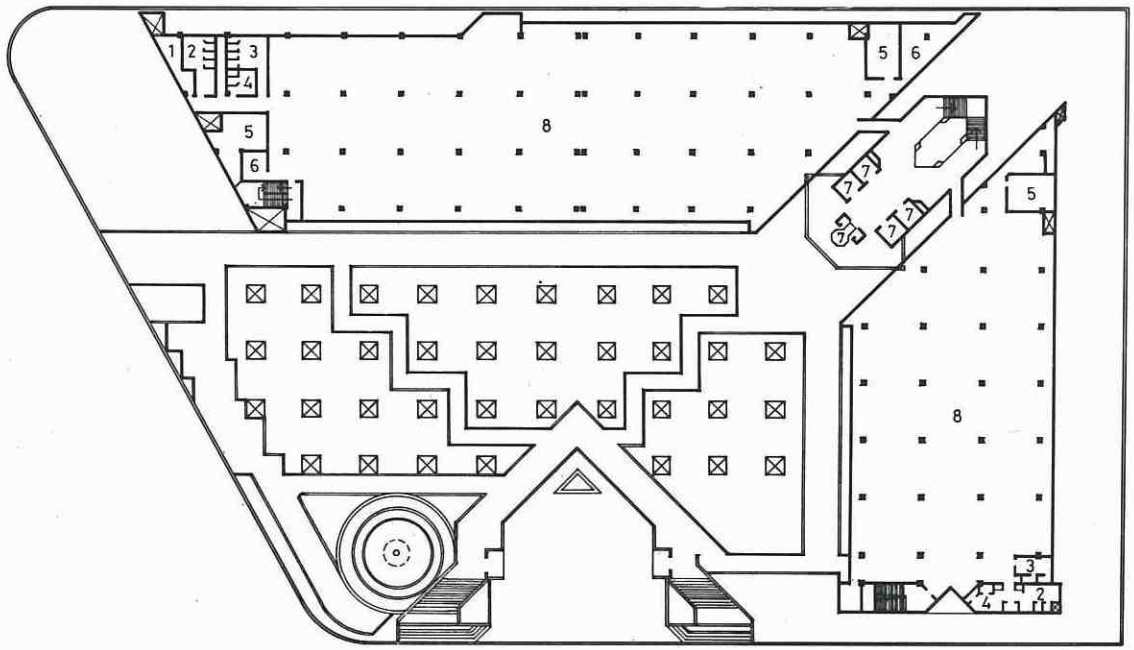
## MAHINDRA & MAHINDRA HEAD OFFICE, BOMBAY (1983-1989)

*Architect:* Raja Aederi Consultants Private Limited, Bombay.

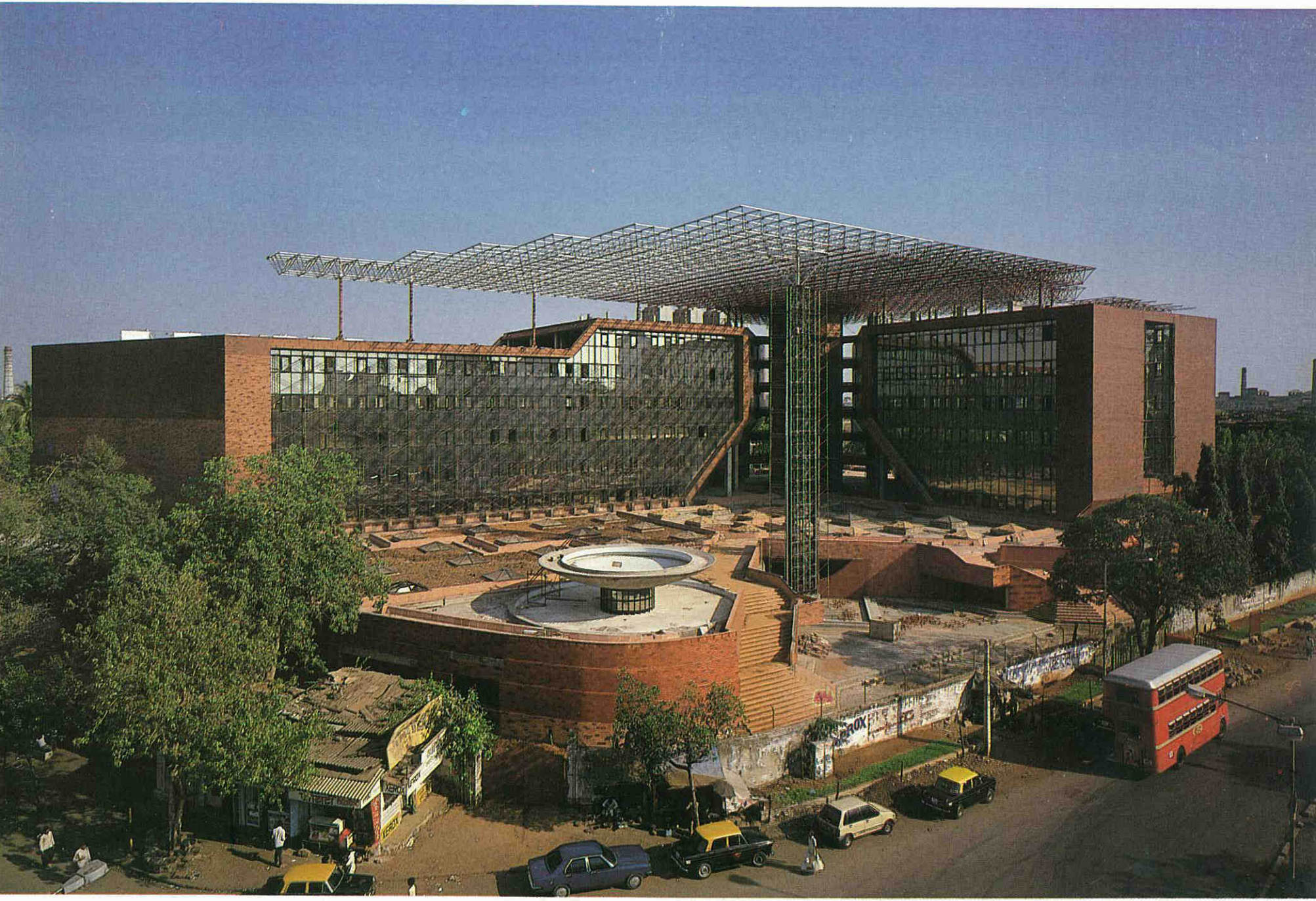
Mahindra and Mahindra's head office building with 18,580 square metres of built-up area is located in Worli in Bombay. The rectangular-shaped site is bounded by roads on all sides.

The architect conceived this building as a landmark which could command attention, inspire and instill total self-reliance. The main entrance to the building is through a majestic flight of steps interspersed with high landscaped terraces on either side of a column supporting space frames, which is a noteworthy architectural feature. The ground floor provides space for car parking, separate dining rooms for officers, ladies and junior staff, the kitchen and lockers, besides a few offices and rooms. The telephone exchange, electrical room, airconditioning plant, transformer, generator and pump rooms are also on the ground level. On the first-floor level one arrives at a podium enlivened with fountains, waterfalls and skylights. The typical floor plan has two office wings connected by bridges to the central circulation core which contains elevators and a staircase. Each office wing also has an emergency staircase. The interiors are left open so that these can be reorganised to suit changing requirements.

The building has a reinforced-concrete frame with brick in-fill panels and glass curtain walls.




TYPICAL FLOOR PLAN



*Mahindra and Mahindra H. O., Bombay* **159**

## LAKESIDE HOLIDAY HOME, LONAVALA (1984-85)

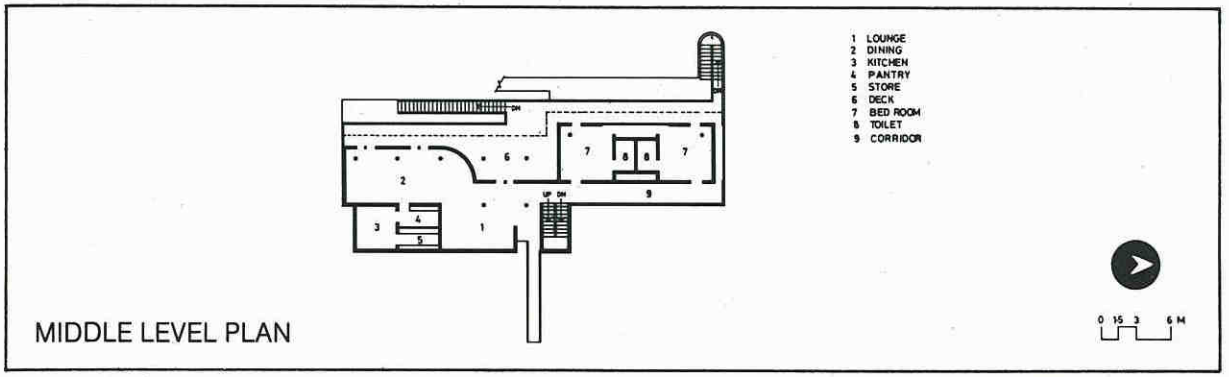
*Architect:* Somaya & Kalappa Consultants Private Limited, Bombay.

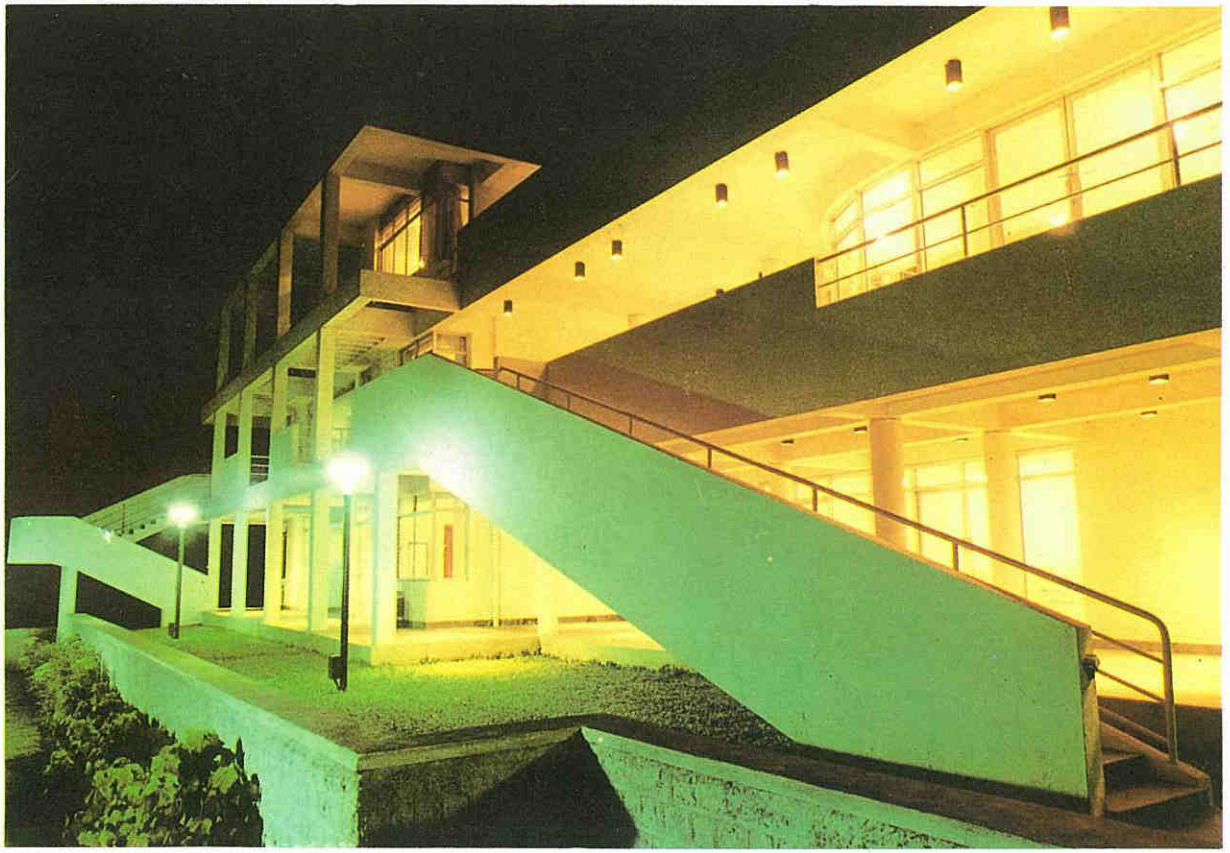
The Lakeside Holiday Home is located on the shores of Walwhan Lake in Lonavala in Maharashtra with a built-up area of 700 square metres. The site commands a panoramic view of a nearby dam and the surrounding hills.

The conventional dictum that a building must merge with its surroundings, has been dispensed with. With wide decks and ramps linking land and water, the building is shaped like an abstracted cruiser, a concept that attempts to generate the air and excitement of a voyage. To ensure privacy, security and convenience of use and service, it has been conceived as a compact structure.

The building has a very simple plan, consisting of three levels. The levels have been determined in accordance with the post-monsoon level of the adjoining lake. A bridge provides access to the building at the middle level, which contains two bedrooms with attached toilets and a living and dining space with a kitchen. The lower level accommodates an additional set of self-contained bedroom units, recreational space and the caretaker's unit. The top floor has a bedroom and a living room which open graciously onto a covered sit-out. The two-layered facade is designed to take care of the high wind pressure common in the area and of rain during the monsoon season. The large windows and expansive decks offer a scenic view of the surrounding lake and hills.

This reinforced-concrete-frame structure has partition walls of brick masonry. The exteriors are finished in white plaster. White mosaic tiles are used for the flooring, except for the decks which are covered with green slate stone.



Lights at night

Feminine concept of architecture

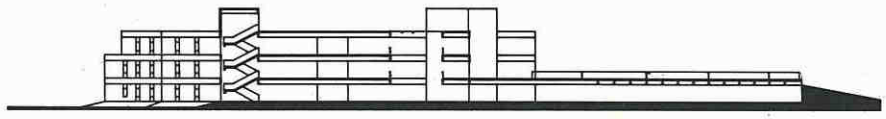
## CORPORATE OFFICE COMPLEX, PUNE (1984-86)

*Architect:* Rumy Shroff and Associates, Bombay.

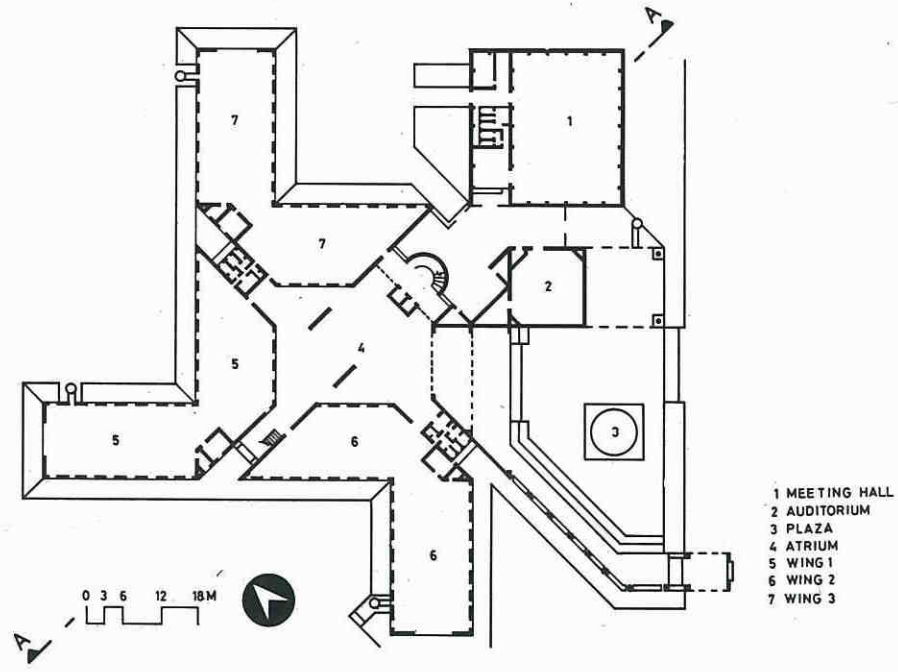
The Corporate Office Complex, with a total built-up area of 9,290 square metres, is located on a 3.6-hectare site in the Akurdi industrial belt along the Bombay-Pune highway. The entry to the complex is from an internal road.

An unfolding square form with extending arms has been evolved, complete in itself while simultaneously being flexible enough to adapt to future changes. To enliven a routine office appearance and to make it conducive to efficient circulation, the square is punctured by an atrium. Two bridging corridors connect the corners, bisecting the volume horizontally and vertically and creating triangular voids. Two staircases and two utility cores are placed at the corners of the square. The atrium, covered with glass, forms an extension of the reception at the ground level. The diffused natural illumination creates an interesting play of light and shade on the internal surfaces of the court. The concrete ribs supporting the glass panels also serve as gutters, which drain out the rain water from the terrace.

The administrative space has four wings of 464 square metres each. This division of space not only facilitates the grouping of various departments but also gives them an independent identity. To simplify the configuration of structural components and ease the interior designing, the entire complex is designed on a module of 1.5 by 1.5 metres. Each wing measures 12 metres in width and has windows on the either side for effective cross-ventilation. To give the building a neat finish, projections over windows have been dispensed with. Projectile windows which swing out perform the dual function of ventilation and protection from rain. A meeting hall with a seating capacity for 500 persons is located at the ground level, directly accessible from the entrance plaza. Earthen mounds surround the meeting hall which opens out onto a landscaped park, where a cafeteria is located. The structural frame of the building is cast *in situ* reinforced concrete. The brick in-fills are plastered on both sides and finished in paint. Marble-mosaic is used for floor finish.



SECTION




GROUND FLOOR PLAN

## NATIONAL INSTITUTE OF IMMUNOLOGY, NEW DELHI (1984-88)

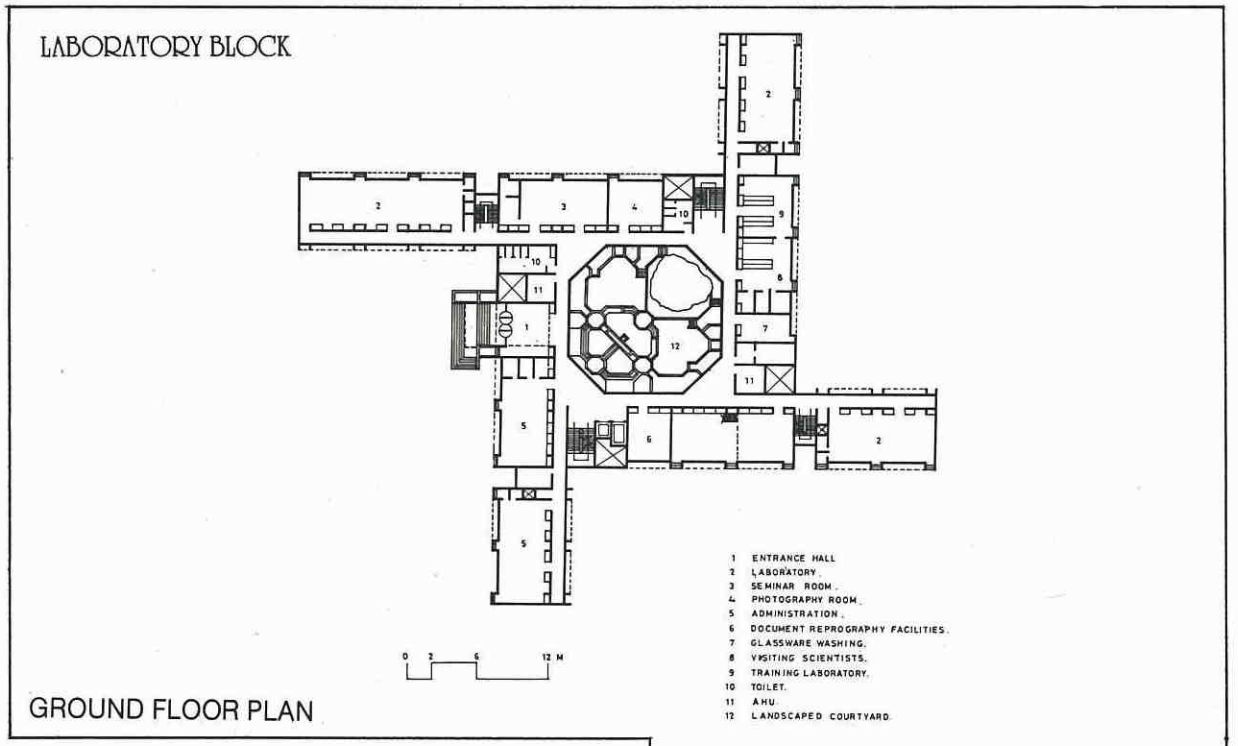
*Architect:* Rai Rewal Associates, New Delhi.

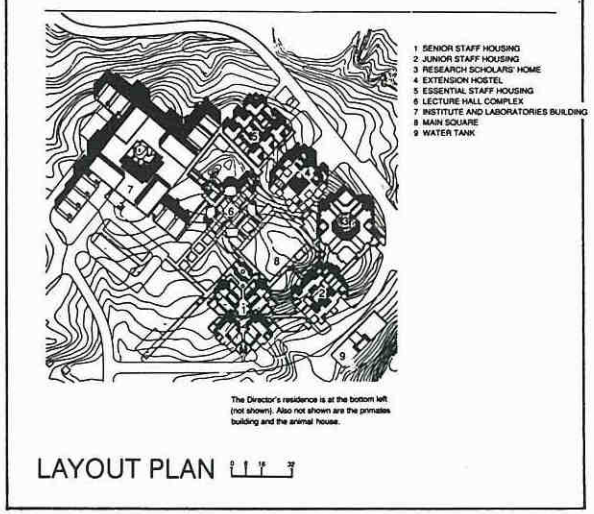
Located on a 7.3-hectare site, within the rocky ridge area of the South Delhi's institutional zone, the National Institute of Immunology is a complex of academic, laboratory and research buildings with clusters of residences for professors and scholars.

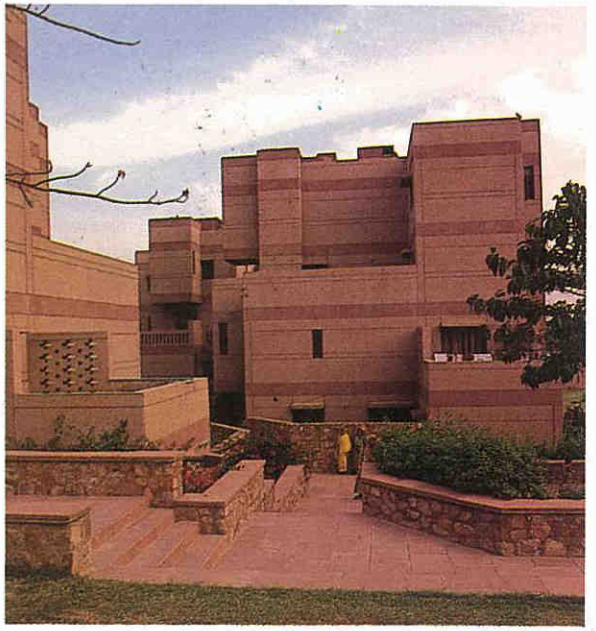
The buildings are so designed as to merge with the surrounding landscape and to create an ambience of harmony between nature and the built-environment. The buildings echo the colours of the rocks on which they are built and closely follow the typology of the site. Traditional courtyards, which act as passive solar control systems to counter the intense heat, form the basis of the design. All buildings are loosely grouped to define a landscaped quadrangle within which is located the lecture hall complex.

A circular peripheral road connects various buildings along the contours at the base of the undulating terrain. The buildings are organised around courtyards of varying scales and functions and are linked to each other through gateways and shaded paths across the enclosures, with distant vistas and shifting axes. Each cluster maintains its own distinct identity as an architectural form and spatial expression. The courtyards are articulated differently, providing in some cases amphitheatres and public spaces for the whole cluster or in others these are defined as forecourts for individual apartments. Yet they all merge with the varying terrain levels and the geometry of the site.

The institute and laboratories building is a square block with four extended wings, punctuated in the centre by a spacious garden court. The lecture hall complex, the site of which becomes the focal point, forms an interface between the institutional and residential buildings. It houses an auditorium with a capacity of 250 seats, a canteen, a faculty lounge and a club. It is designed at two levels—the auditorium and its appendage areas on the ground level and the seminar and banquet rooms on the upper level. The internal courtyard of the housing for senior staff is accessible from the four corners of the cluster, as the buildings are laid on a diagonal axis to the main road. The junior staff housing is also designed around a central courtyard having access through the central points of the sides. The research scholars' home has two L-shaped residential wings arranged around an amphitheatre. The courtyards within the essential staff housing are designed as a series of sequential nodes along the two sides of a shaded street. Each courtyard becomes a meeting point for four households.

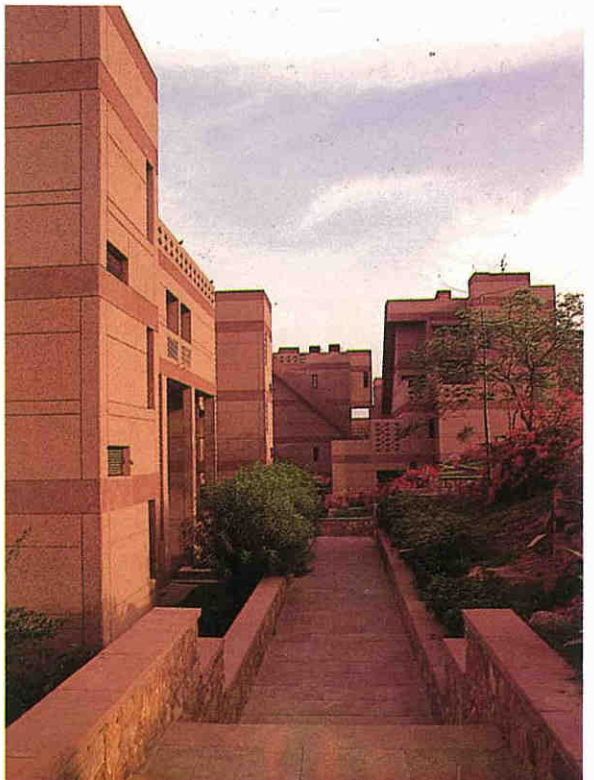




Bands that bind and colour that splashes

Immunity from boredom: Institute of immunology



Path that does not mislead

Externally the buildings are finished in sandstone grit. The red and beige colours of sandstone define the structural system and echo the colours of the rocks scattered around the site. The courtyard walls of the housing clusters are built with quartzite stone excavated from the site.

## SAIIER PRIMARY SCHOOL CAMPUS, AUROVILLE (1984-88)

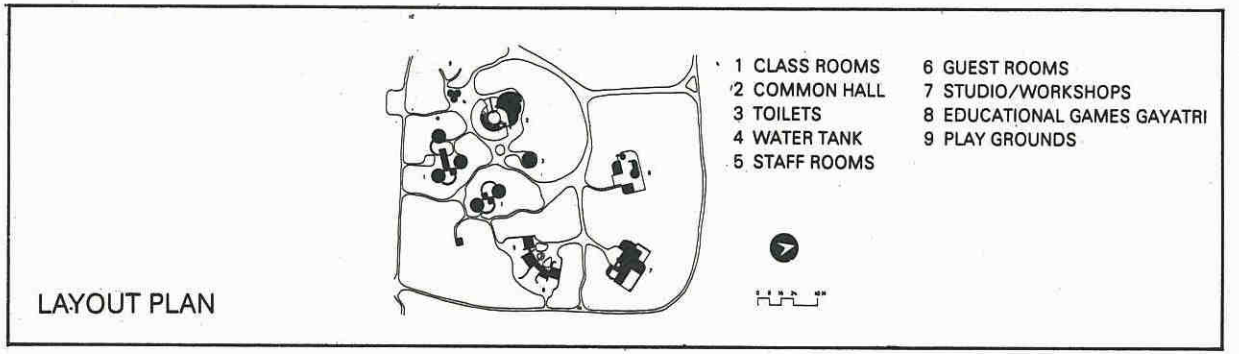
*Architects:* Piero and Gloria Cicionesi, Auroville.

The SAIIER Primary School is built on a two-hectare site in "Transition," within the cultural zone of Auroville in Tamil Nadu. The site is surrounded by agro-forestry and a few scattered residences.

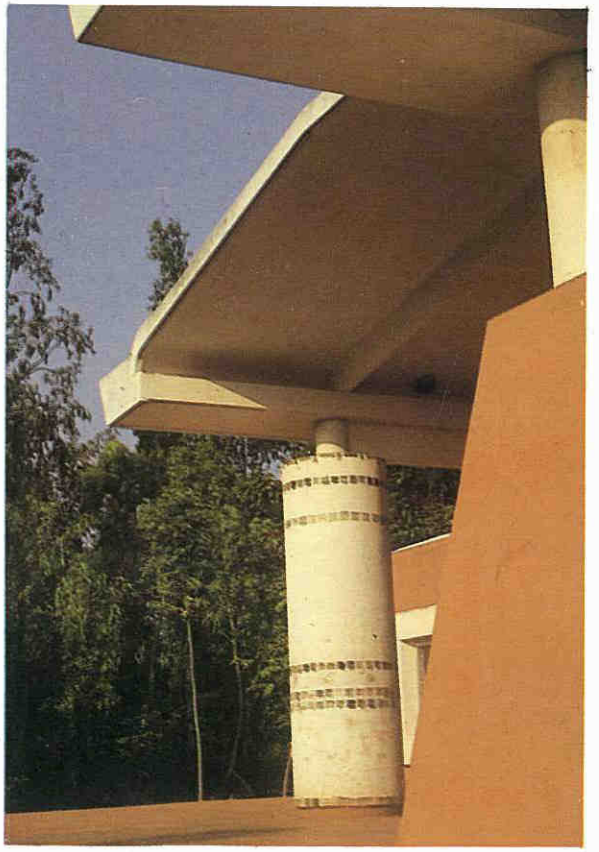
The Sri Aurobindo International Institute of Educational Research (SAIIER) has set up this school for children between the age group of 6 to 12 years to experiment with free methods of education. The campus comprises classroom blocks, a common hall with an amphitheatre, an art and craft workshop, staff quarters, toilets and a water reservoir. There is provision for an educational-games wing in future.

The building blocks are scattered to prevent noise in one unit from disturbing the quiet of the other. An attempt has been made to provide an environment which could encourage free and uninhibited expression among children. Another factor which determined the planning was phased development. All blocks are connected with a free-shape pathways.

The classrooms are designed to accommodate 12 to 18 children. Each classroom has its own storeroom and is provided with a small verandah. The common hall block consists of a library, multipurpose space, storeroom and a small amphitheatre. The art and craft workshop contains a painting hall, a sewing and embroidery room, science room, food laboratory, mechanical workshop and storage space. Residences have been provided for staff members. The total built-up area of these blocks is 848 square metres.



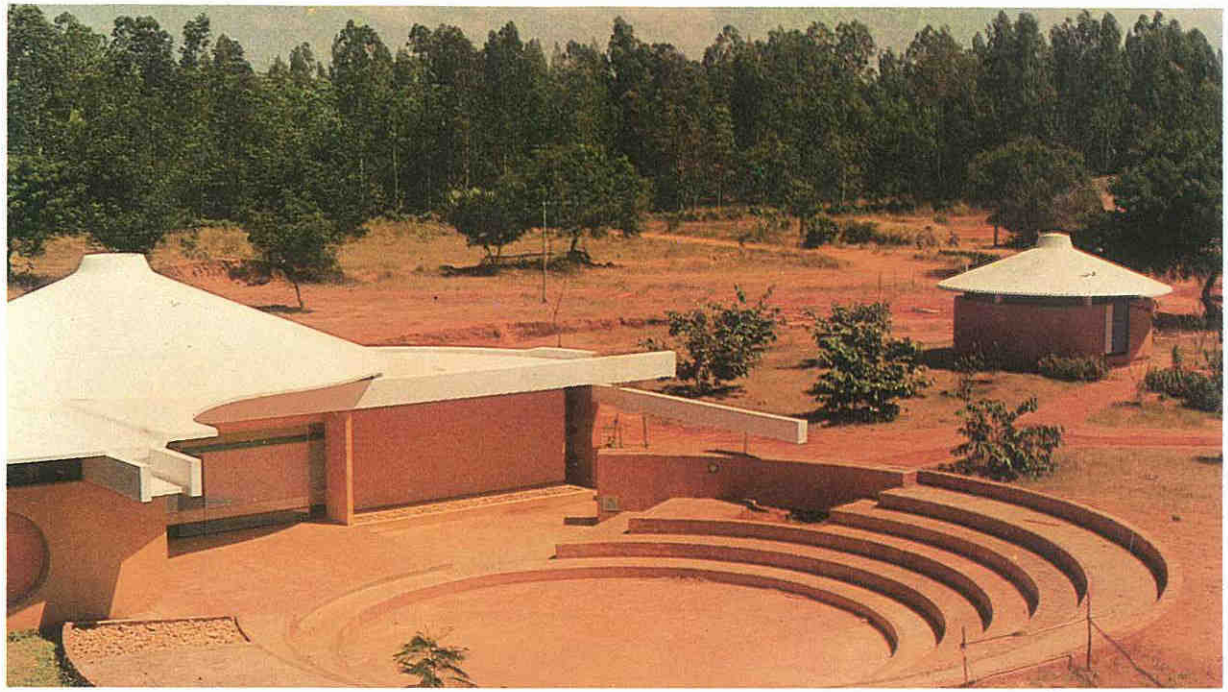

LAYOUT PLAN



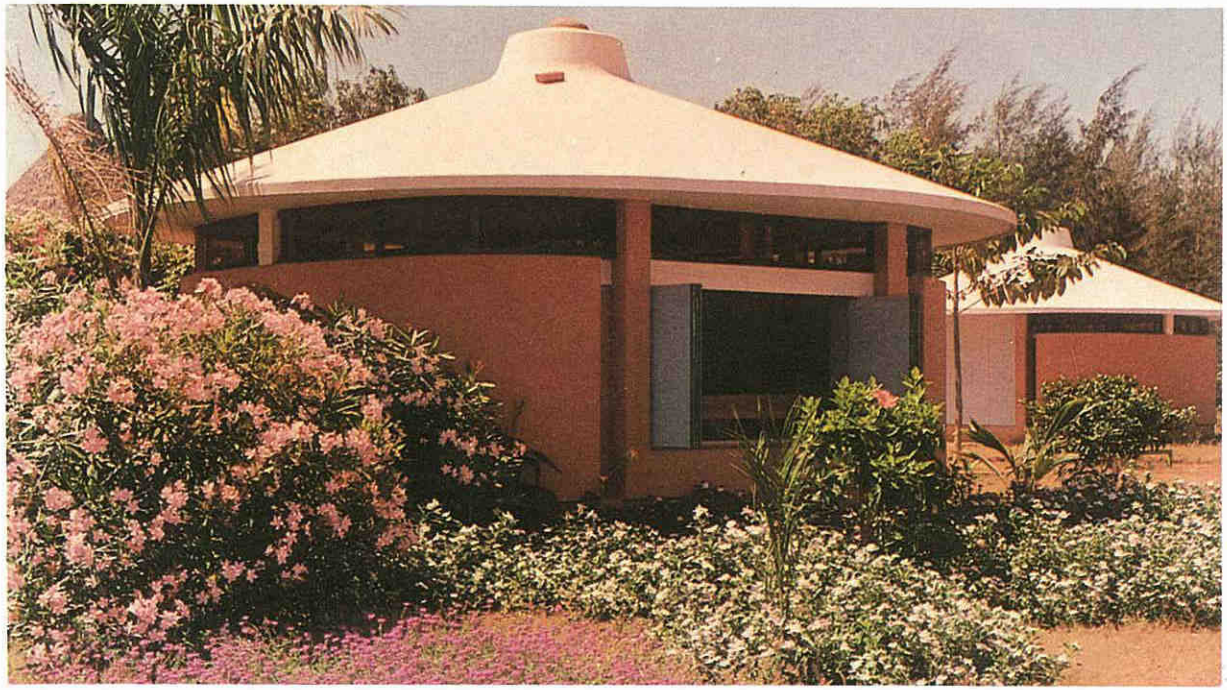
Pillar of spiritual strength: School for the young

Most of the buildings have a light ferro-cement shell roof in the shape of a conic dome, found to be a most suitable geometrical form for this material. Therefore, the buildings have a roundish shape. The roofs are painted white to reduce substantially Sun's radiation in the rooms. A continuous wire-mesh window between the side walls and the roof is provided for ventilation.

Unfolding child talents amphitheatrically



Conceptualising Aurobindo architecturally



Common hall for young scholars

## ENGINEERING COLLEGE, KOTA (1984-1991)

*Architect:* Uttam C. Jain, Bombay.

The Engineering College complex near Kota in Rajasthan is planned over a 140-hectare site along the south-east bank of the River Chambal. It is accessible from the road leading to the Rana Pratap Sagar Dam.

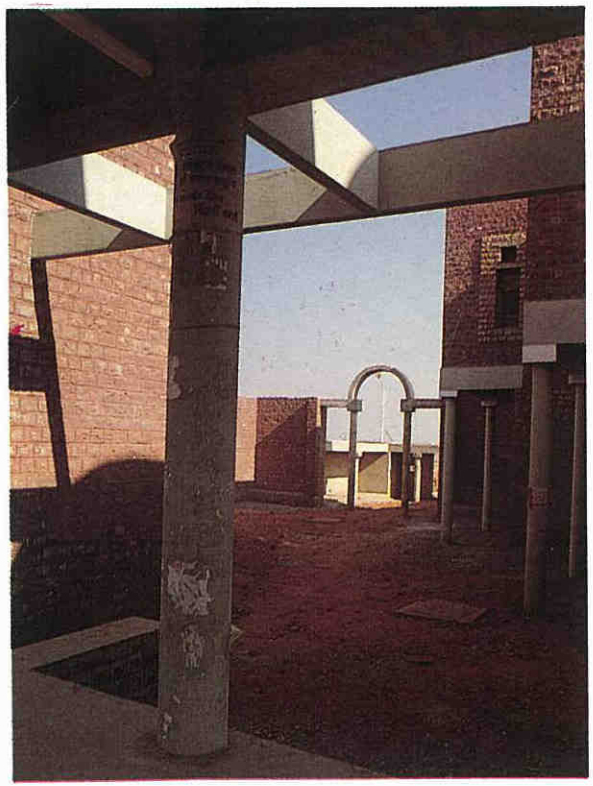
The complex, with a built-up area of 2,45,000 square metres, is predominantly residential in nature. The campus layout can broadly be divided into three main zones—the academic, faculty housing and students' hostels. All these have been carefully planned, keeping in mind the topographical conditions, and inter-relationships and the functioning of the zones.

The main concept revolves around the principles "interaction at every stage" and "man on foot." This necessitated evolving close-knit pedestrian cores interspersed with landscaped courts where students can pause and establish contact beyond the teaching areas. The vaulted roof all along the main spinal corridor that connects different faculties and common facilities not only gives visual cohesiveness but also creates an air cushion, keeping the movement areas relatively cool and bearable.

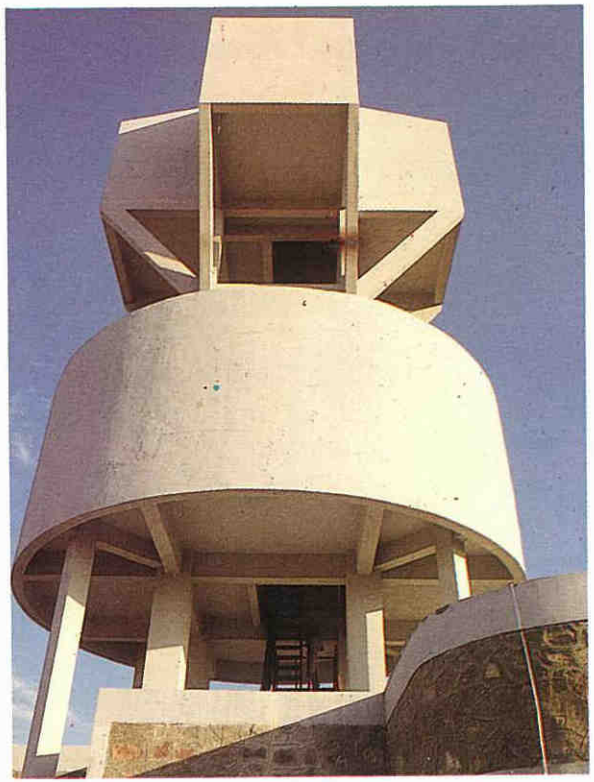
Evocative of the morphology of a desert settlement, the layout assimilates the architecture of street fronts and public squares for learning. Indigenous stone and surplus manpower, typical of the Indian situation, have been used to the maximum extent possible. Considering the rock surface of the entire area and the hot climate, the site has been tropicalised with dense forestation, especially in the areas outside the building zones.

Kota stone, being locally available, has been fully exploited in the design of the campus buildings. Two natural shades of the stone have been used. Natural materials are left untreated, revealing their texture through a play of light and shade. A combination of load-bearing stone walls and reinforced-concrete frames has been used as the basis of the structural system.

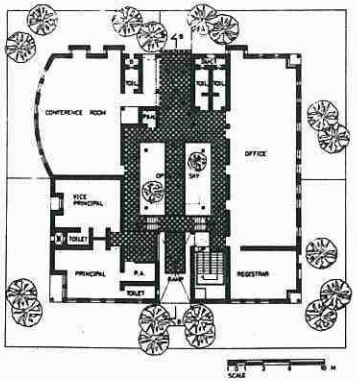
Keeping Kota heat out



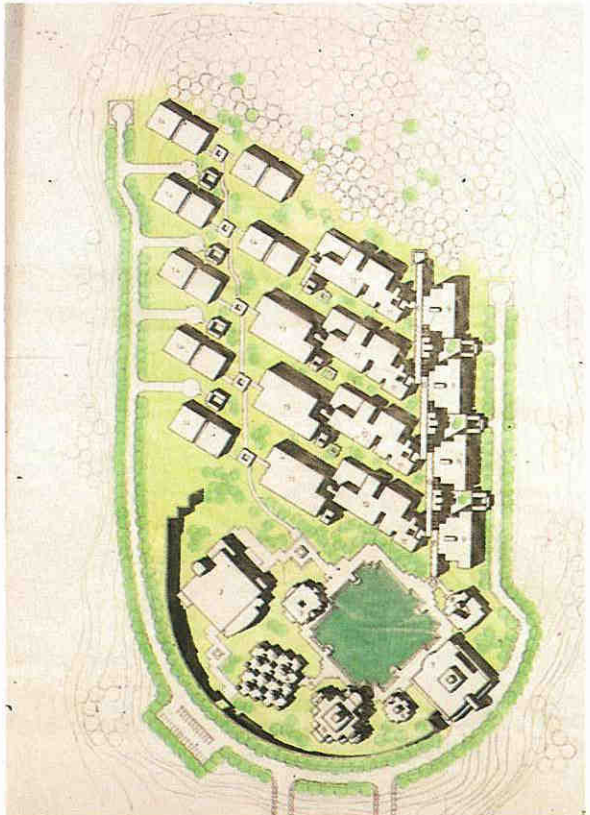
No watery architecture to store water



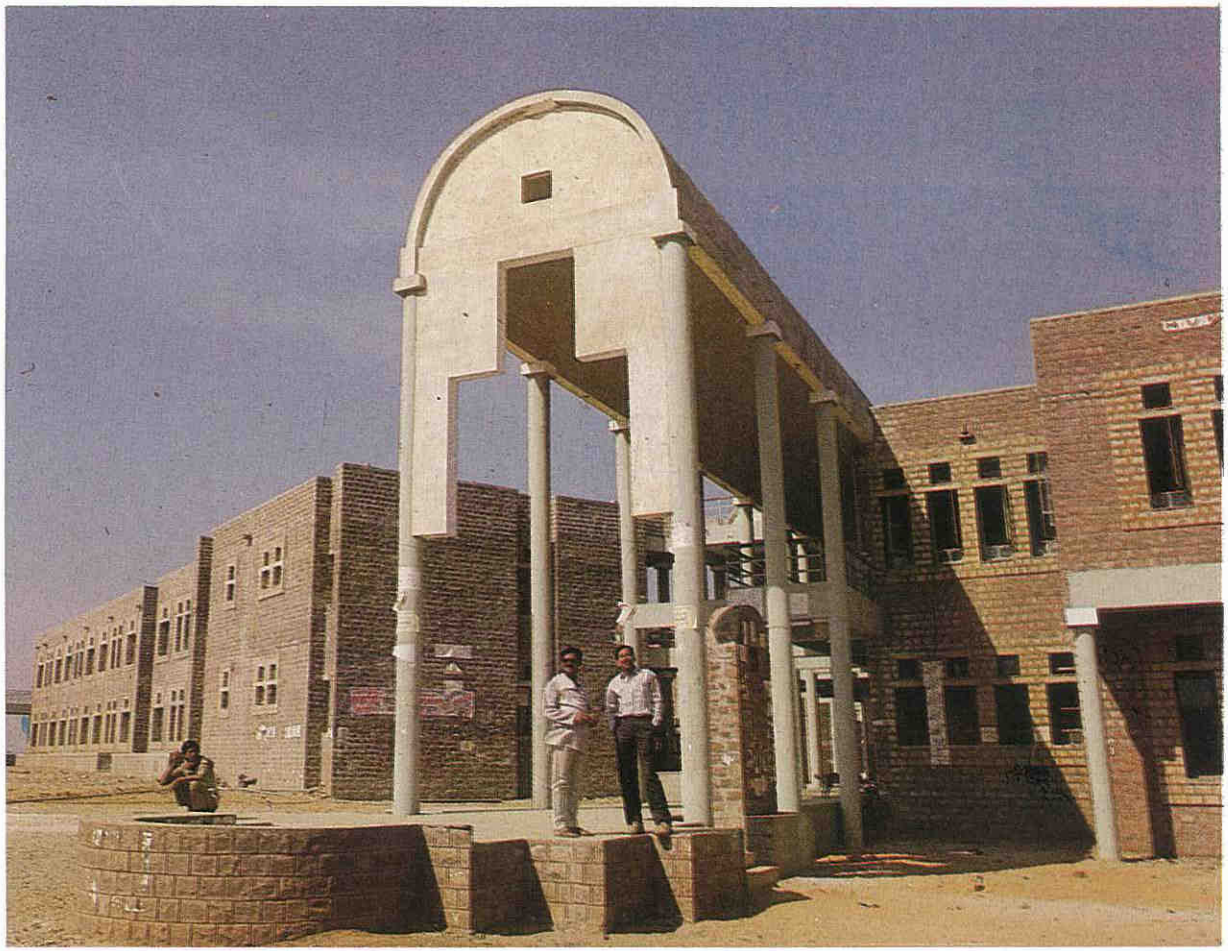
ADMINISTRATIVE BUILDING




FIRST FLOOR PLAN



LAYOUT PLAN



Engineering the entry

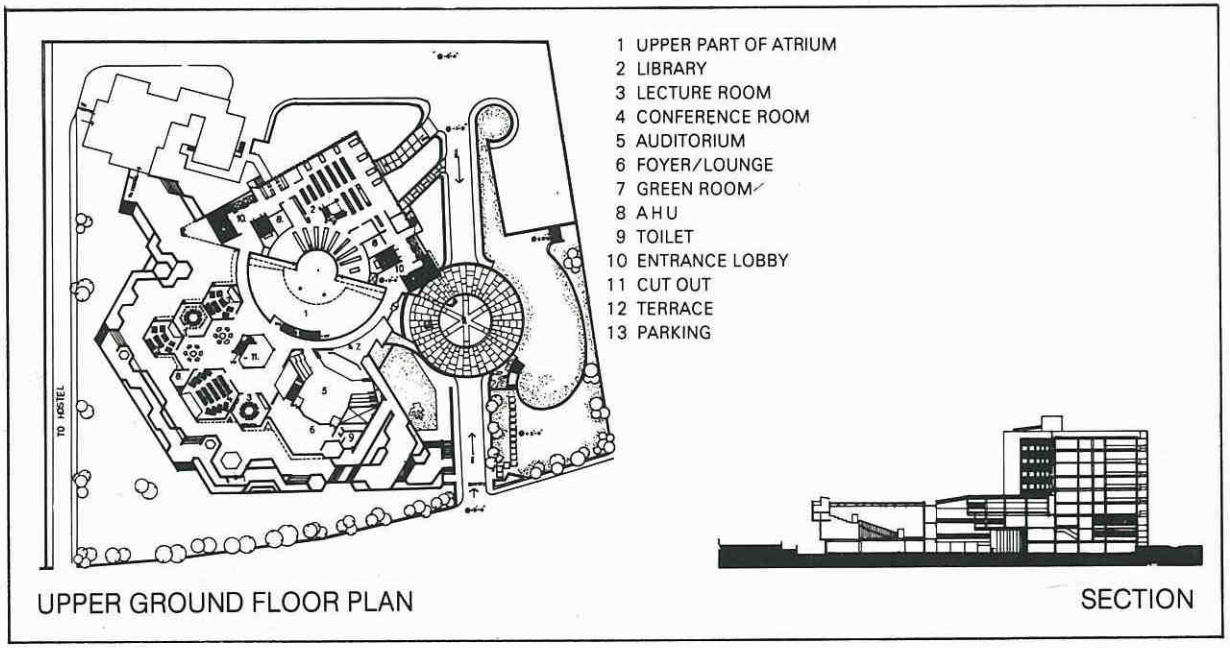
## INDIAN INSTITUTE OF FOREIGN TRADE, NEW DELHI (1985)

*Architect:* Bali Benjamin and Associates, New Delhi.

The Indian Institute of Foreign Trade, set up for training and research purposes, is situated on a 1.2-hectare plot in the institutional zone near the Indian Institute of Technology in New Delhi. The main institute building comprises a nine-storeyed triangular administrative block and a three-storeyed teaching block. An eight-storeyed hostel with a warden's residence has also been proposed on this small site. The complex, with 1,534 square metres of built-up area, has been designed on a triangular module which gives rise to hexagonal teaching areas and auditorium, all merging into a large semi-circular atrium. It receives subdued light through nine tinted glass panels fixed in the ceiling, which also serve as an energy-saving device.

The approach to the building is from the basement level through a circular driveway running around a pyramidical sculpture with important languages of the world and trade seals engraved on stone panels. The natural depression in the site has been fully exploited by creating a sunken garden around the basement. This has resulted in making the basement as usable as the other floors. The possibility of this level being flooded has been eliminated by diverting rain water through an underground channel into a deep ravine across the front road.

The ceiling design is of triangular reinforced-concrete coffers which form the structural grid. All the external surfaces are clad with buff-coloured sandstone slabs.




UPPER GROUND FLOOR PLAN

SECTION

Illusion of sculpture

Structural elements: Aesthetic integration

Obeying site—architecturally

## GARWARE HOUSE, NASIK (1985-86)

*Architect:* Somaya & Kalappa Consultants Private Limited, Bombay.

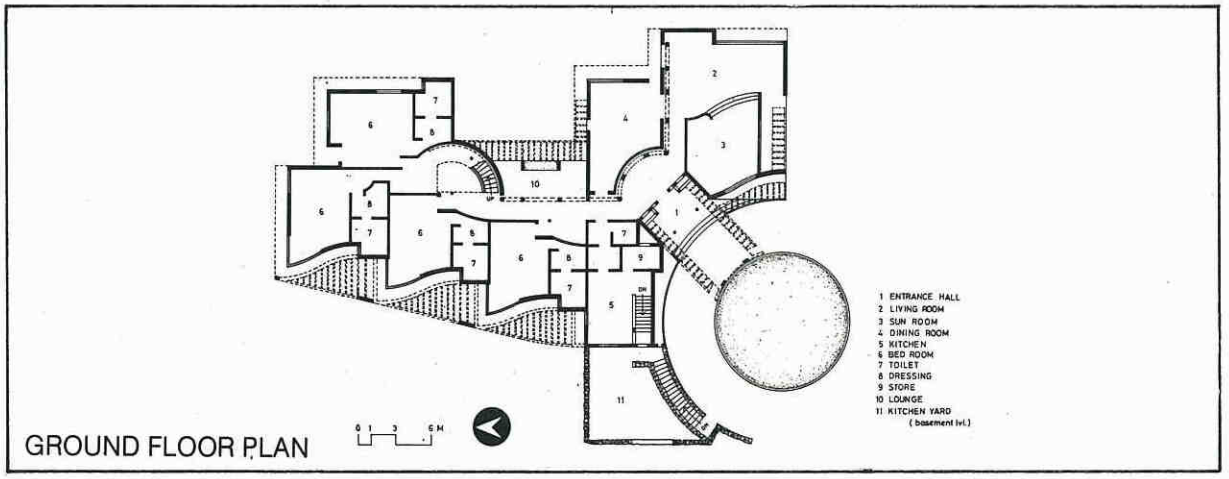
The Garware House has been built at the base of the Pandav Leni Caves on the Bombay-Nasik Highway. The caves are steeped in history that dates back to over 2,000 years. The building has covered area of 530 square metres.

It was very difficult to ignore the immediate environment and its historical perspective while designing the building. After much consideration, the architects decided that the building should not merge into the contours formed by the backdrop of hills; rather, it should stand in piquant contrast to this background. Thus the form of the building has been set in stark contrast to the simple conical form of the hill behind.

The porch has an interesting perforated wall alongside. The strong, curved entrance sets the tone for the rest of the house, with its free-standing planes and undulating facades. The clear sunlight on these planes fashions intricate patterns of light and shade, while vertical skylights further enhance the quality of light within the building.

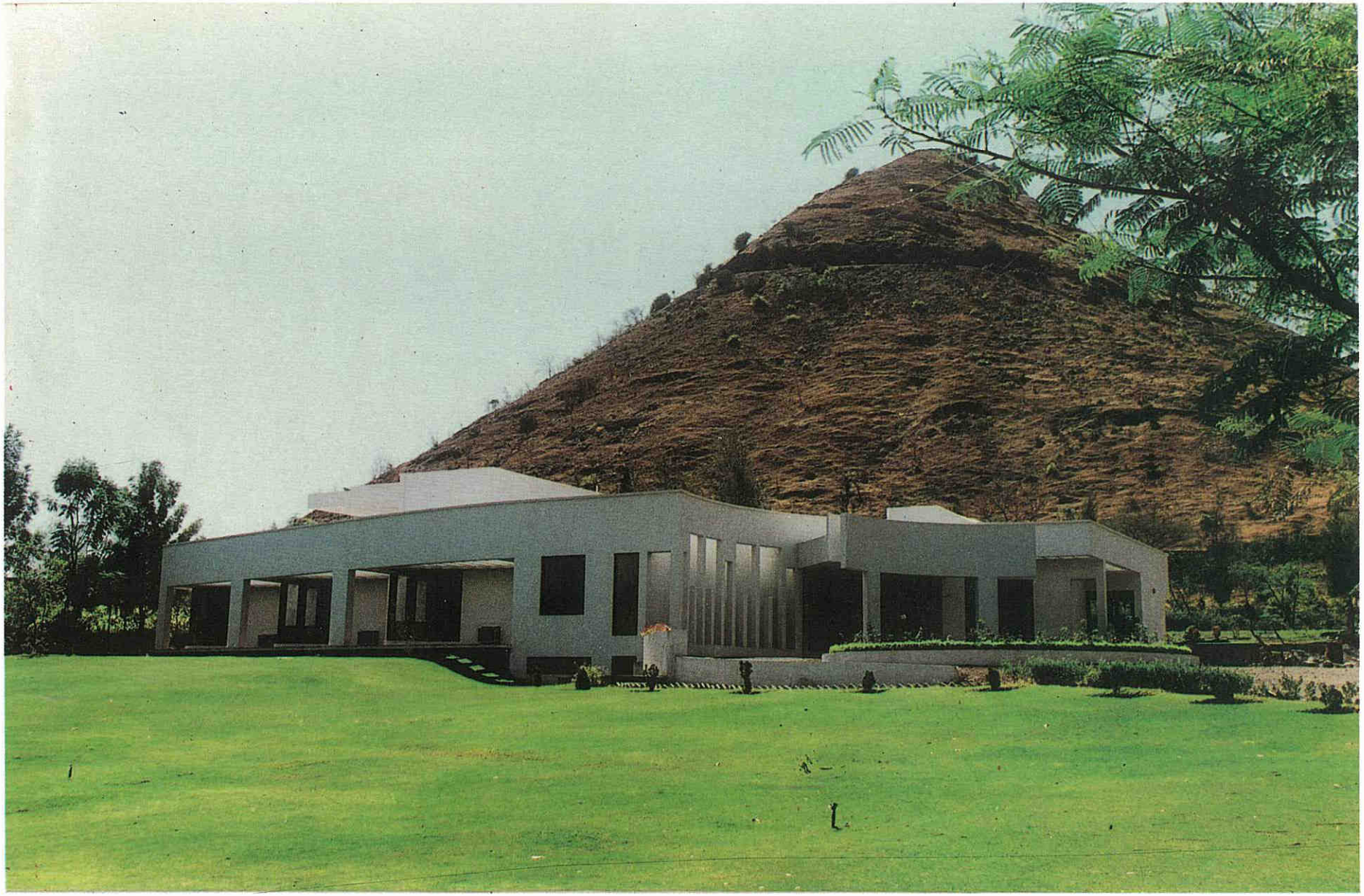
To exploit the unrestricted view of the sweeping hills on all sides, the building is not oriented in any direction. Each room has been planned to get a fair share of the scenery, without losing privacy. The bedrooms have an interesting curved window facade with full-length glazing. A verandah protects the windows from rain and the sun.

The building is constructed in concrete and plastered white, further enhancing its form in the sun.



GROUND FLOOR PLAN


Welcoming facades



Nature and Architect: Harmony in contrast

# ENTREPRENEURSHIP DEVELOPMENT INSTITUTE, AHMEDABAD (1985-87)

*ArchitectS:* Bimal Patel and Hasmukh C. Patel, Ahmedabad.

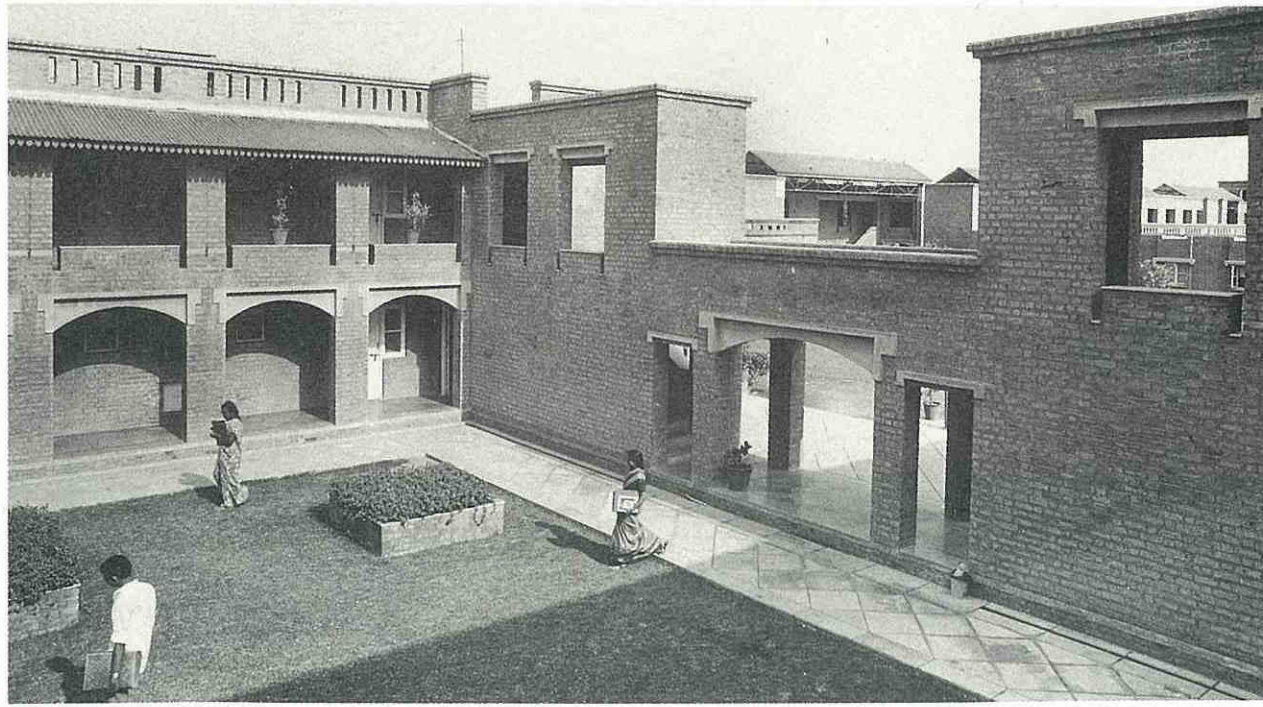
Located on the outskirts of the city of Ahmedabad, the Entrepreneurship Development Institute has a built-up area of 6,820 square metres in the first phase. It comprises a training centre, research centre, library and an auditorium, besides an administrative block and hostels.

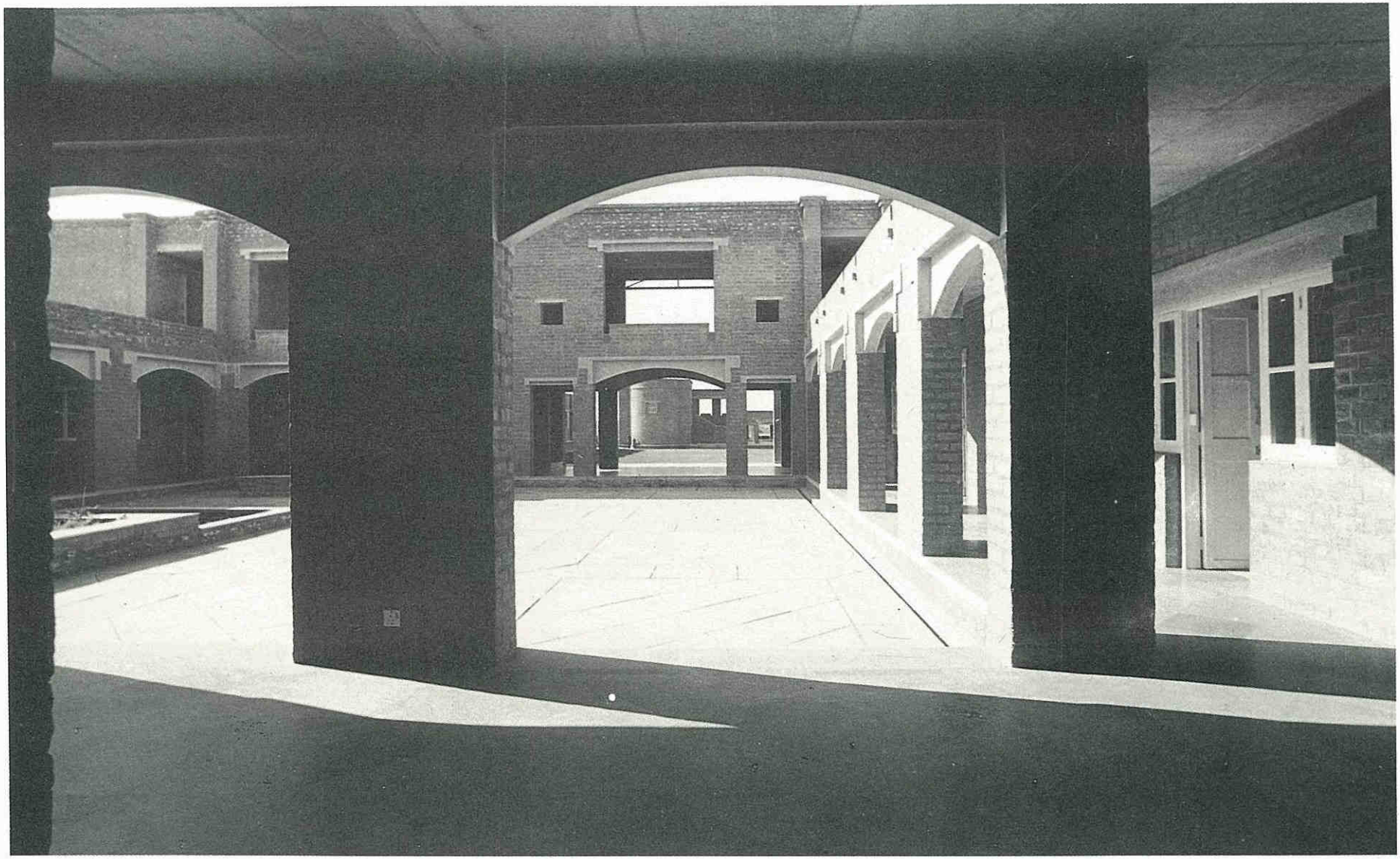
The design of this horizontally spreading campus with an introverted environment is based on the concept of segregation of various functions, courtyard planning and the use of spacious verandahs and corridors. Besides the internal courtyards in the individual building blocks, the outside spaces between the blocks are so organised as to set the buildings with a foreground which in the third dimension merges into infinite space. The main circulation spine stretching from the entrance pavilion to the library interlinks the various departments. It is so articulated as to provide a varying visual experience, enriched by the three-dimensional treatment and the series of inside and outside spaces. To introduce new facilities, the spine can be extended and new departments attached.

The academic buildings are placed on a higher level of the site to bring them into prominence. The main court, defined by a canteen and the auditorium, serves as an informal meeting place for the faculty and students. The computer centre is located centrally on the first floor of the training centre to make it easily accessible from all departments. The library is conceived as the fastest expanding facility and designed in a way that the existing service and control areas become centrally located once the building is extended. Each individual working space in all the departments contains two types of spaces—a general area for meeting people and a more private alcove or storage area for books and documents. Since the students and trainees reside on the campus only for short periods, the hostel blocks are kept in close proximity to institutional activities. The hostels are accessible primarily from the entrance pavilion and are also organised around the landscaped courts.

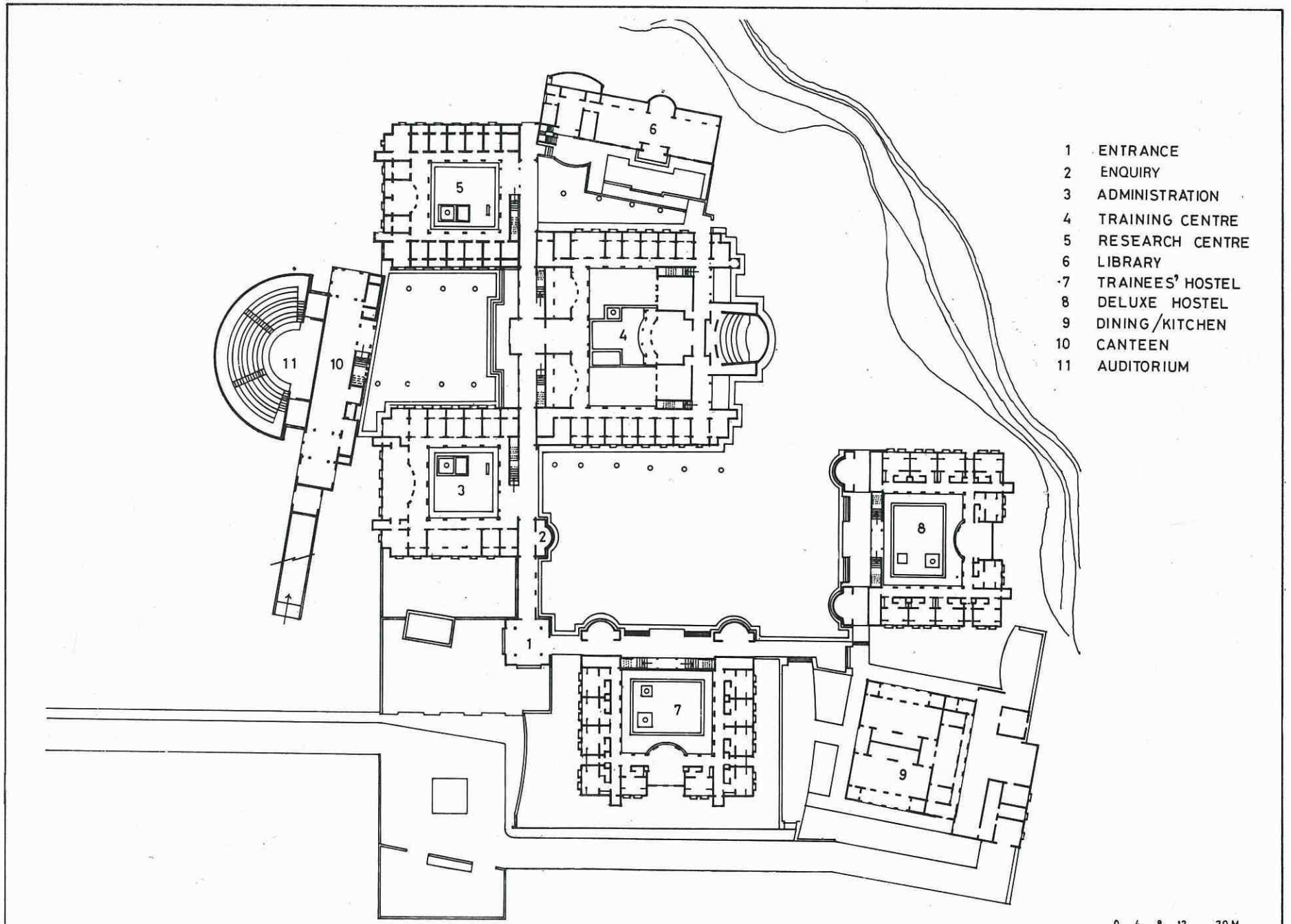
The buildings are designed to minimise the consumption of artificial energy. This has been achieved by the repetitive use of open-to-sky courts, verandahs and recessed windows in thick masonry walls, which help in forming barriers to the sun without shutting off natural light. The reinforced- concrete slabs, insulated by the use of inverted clay pots and china mosaic finish on the terrace, are the other means of reducing heat gain. Externally, the buildings have an exposed brick finish and are further enriched by the introduction of a variety of concrete lintels over the openings.

Courts and openings: Visual variety



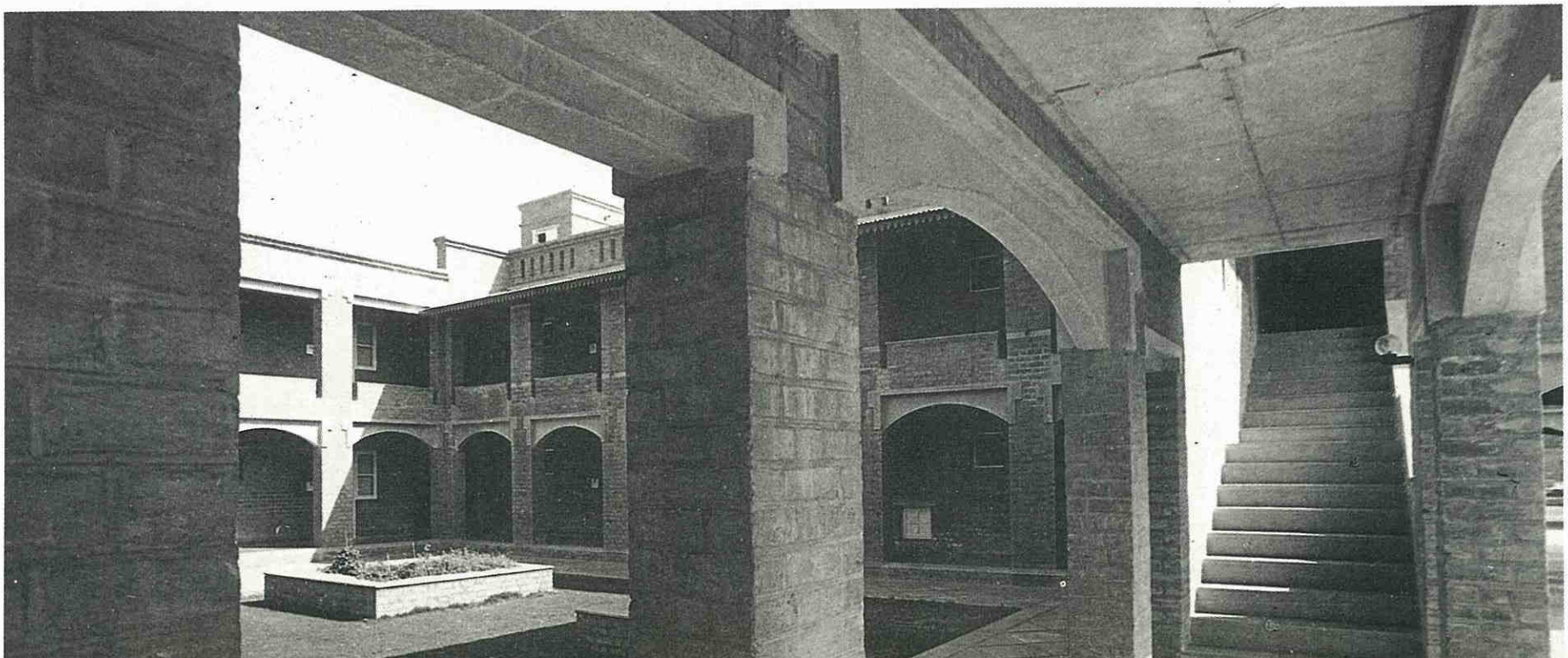


Modernising tradition: Courtyard in today's structures


1 ENTRANCE
2 ENQUIRY
3 ADMINISTRATION
4 TRAINING CENTRE
5 RESEARCH CENTRE
6 LIBRARY
7 TRAINEES' HOSTEL
8 DELUXE HOSTEL
9 DINING/KITCHEN
10 CANTEEN
11 AUDITORIUM
0 4 8 12 20 M

LAYOUT PLAN

Past shaking hand with the present: Deep verandahs



Creative interplay of brick and concrete

# INDIRA GANDHI INSTITUTE OF DEVELOPMENT RESEARCH, BOMBAY (1985-87)

*Architect:* Uttam C. Jain, Bombay.

The Indira Gandhi Institute of Development Research is located in Goregaon, a picturesque green suburb of Bombay. The site, a sprawling 57 hectares with a steep topography, is close to two historical monuments—the Elephanta Caves and the Jogeshwari Caves. The campus comprises two zones—the institutional and residential. The institutional spaces consist of an auditorium, a computer room, a research wing, an administration block, a recreation hall and a service core. The residential accommodation caters to the needs of the staff, researchers and visiting scholars.

The design responds both to the topography and the architectural heritage of the region. The buildings are low-profiled masses that are loosely connected so that they seem to merge with the flora and fauna of the surroundings. Each component of the earth-reveted structure is interlinked by pneumatic connectors. To respond to the hot and humid climate, a series of paper-thin sections have been designed through the double-skin principle. The inner structural skin is pierced by windows and the outer provides protection from extreme weather. The barrel vault, a repetitive roof element, evokes the elemental vaulted roofs of the caves.

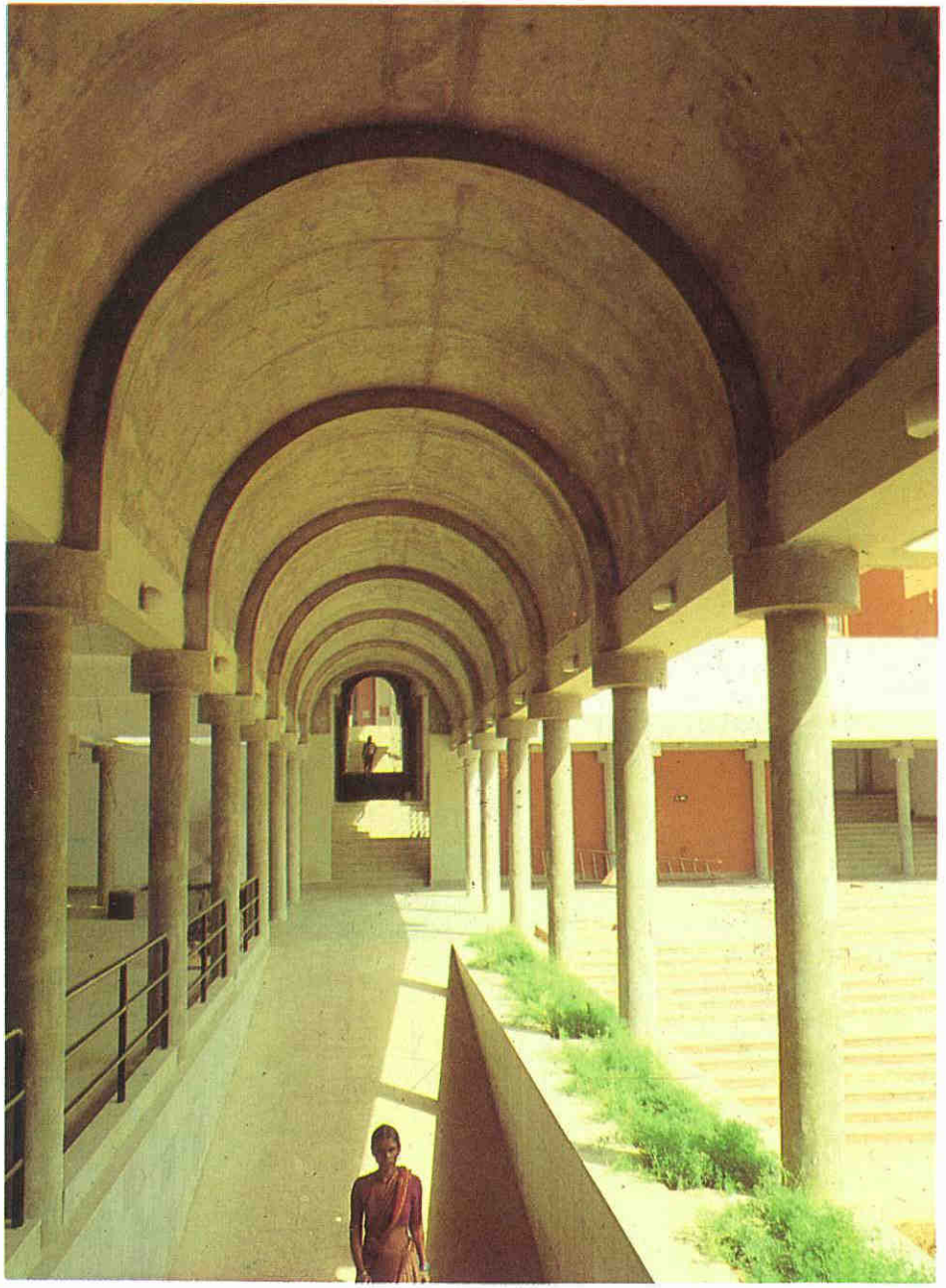
The theme "darkness to light" is achieved in the building by a graded admittance of natural light from the dark auditorium to the bright researchers' cubicles. The density of movement from the "City Gate" onwards similarly follows a gradation, where in the final phase the research cubicles maintain the needed seclusion. A meandering link-corridor is designed to encourage interaction between the users.

A mural on the double height "City Gate" invites the visitors to a sunlit place encompassed by intensely built steps which make the backdrop structures rise surrealistically, like India's river-front scenario. A walled garden is developed outside the library for contemplation. A sit-out deck is appended to the cafeteria to enjoy the outdoors. Water as a landscape element is used through top-lit fountains in foyers and lobbies.

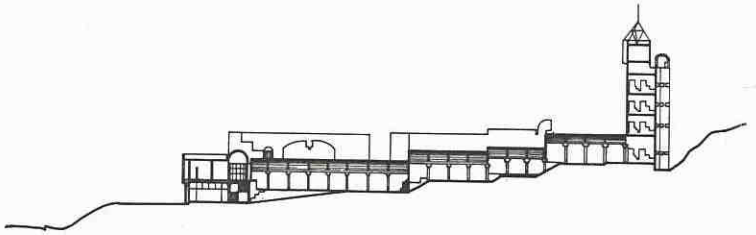
Majestic vault entry

To give a handicraft look to the complex, natural materials and the maximum possible manual labour have been used.

*I.G. Institute of Development Research, Bombay* **179**



Corridors of development



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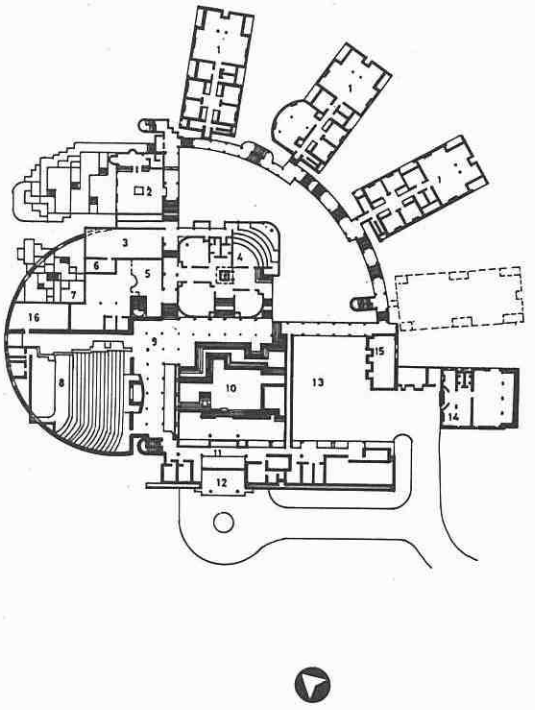
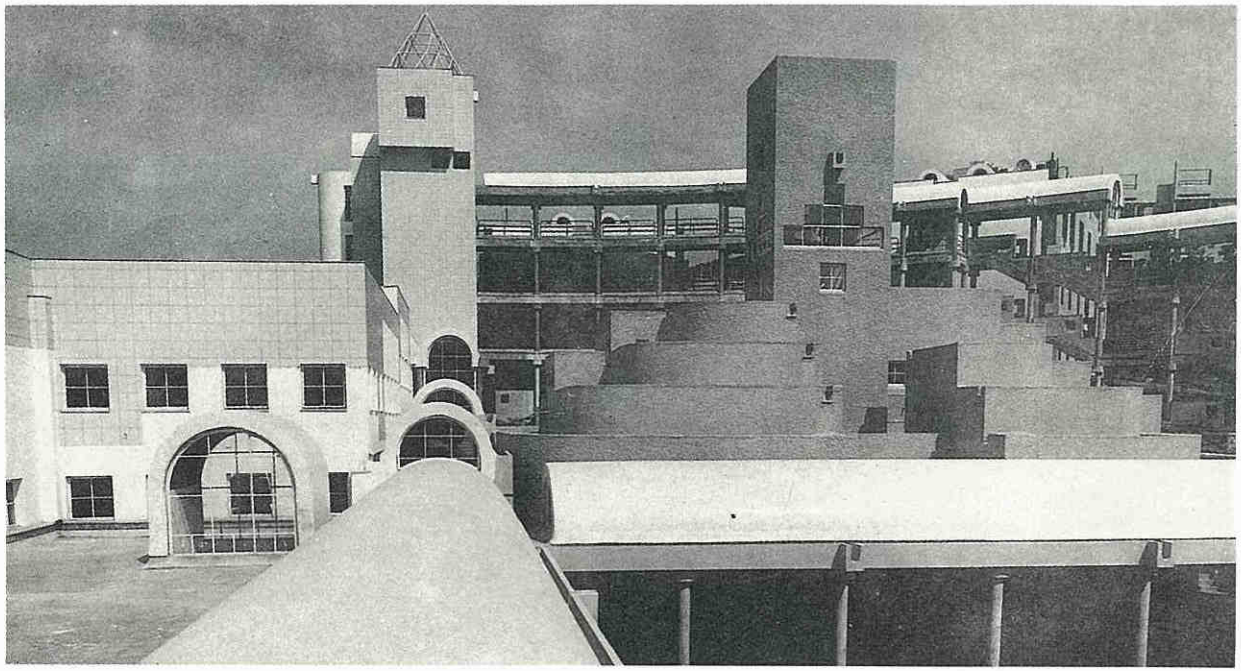
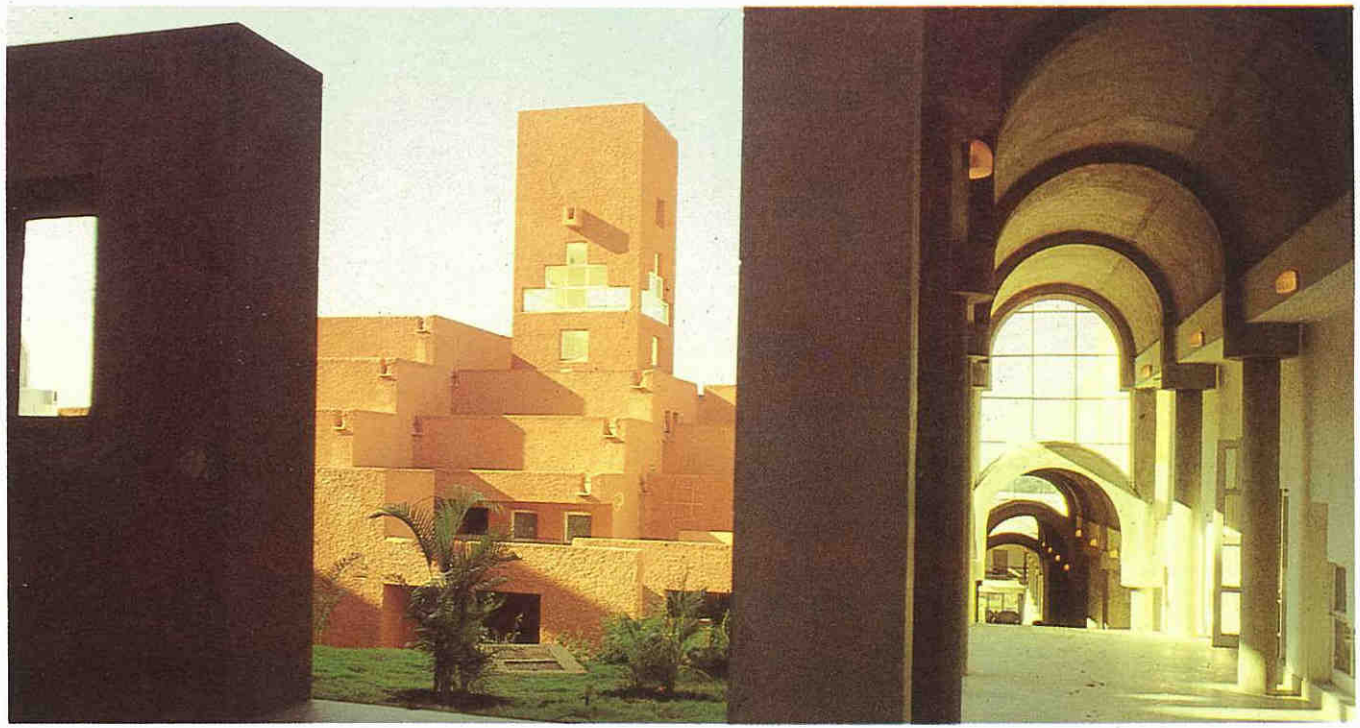


1 RESEARCH
2 CAFETARIA
3 COMPUTER
4 SEMINAR ROOM
5 LIBRARY
6 AHU
7 CONTEMPLATION GARDEN
8 AUDITORIUM
9 PAVILION
10 SUN PLAZA
11 ADMINISTRATION
12 CITY GATE
13 PARKING
14 RECREATION
15 L T PANEL
16 TOILET

PLAN



Romance with topography



A smooth journey—from corridors to courtyards

## PLANETARIUM COMPLEX, BANGALORE (1985-87)

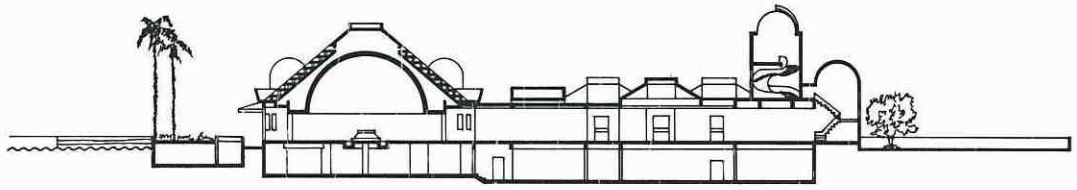
*Architect:* Prem Nath & Associates, Bombay.

The Planetarium Complex, which also functions as an educational and cultural centre, is located near Raj Bhavan in Bangalore on a very prominent site—triangular in shape and surrounded by main roads on all three sides. It comprises an outer space theatre, exhibition areas, a children's art gallery, a book stall, lecture halls, an administrative office and an observatory tower, besides the necessary infrastructure required for its functioning.

The complex with an area of 2,650 square metres is primarily divided into two distinct blocks—the octagonal outer space theatre block on the south-western side and the exhibition block on the north-western side. A cylindrical observatory tower with a high revolving dome and Claude telescope is attached to the exhibition block on its northern fringe. Both blocks, though well-connected through a common circulation space, have separate entrances and exits to avoid intermingling of visitors.

The octagonal outer space theatre block houses a 300-capacity circular theatre with a 3-metre-wide corridor encircling it. The theatre, with seating in concentric rows around a projector in the centre, has four entrance and exit doors opening out into the circular corridor. This corridor has subdued light and helps in avoiding the visual discomfort that could be caused to the audience by the sudden contrast of total darkness within to the dazzling daylight outside at the time of exit. Four semi-circular niches have been designed along this corridor for displaying art objects.

All the external surfaces are clad in buff-coloured sandstone and the internal walls of the circulation and exhibition areas are in pink marble. The flooring, except for the basement, is also in marble.



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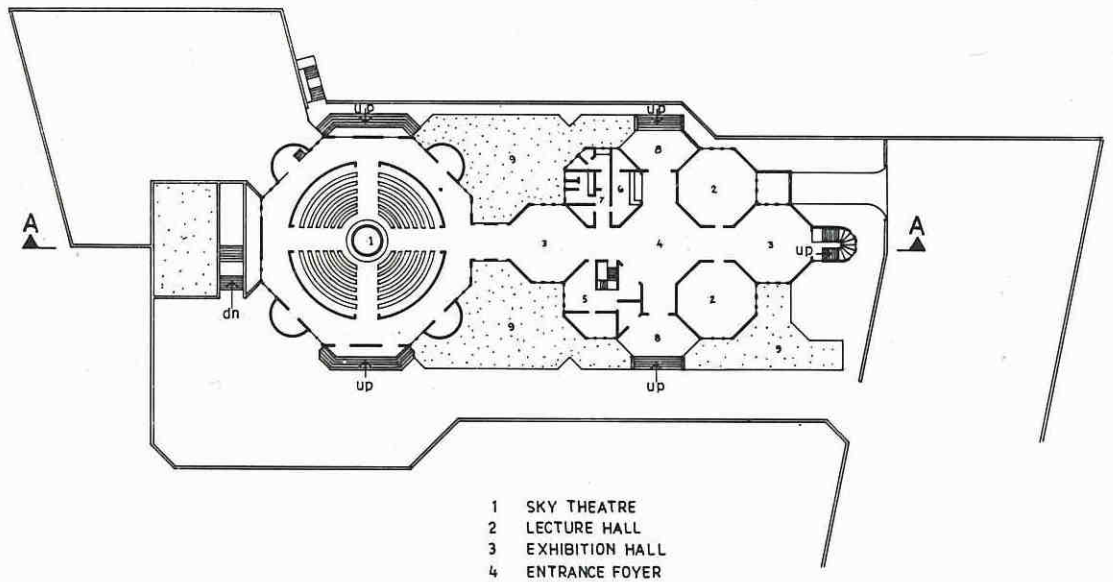
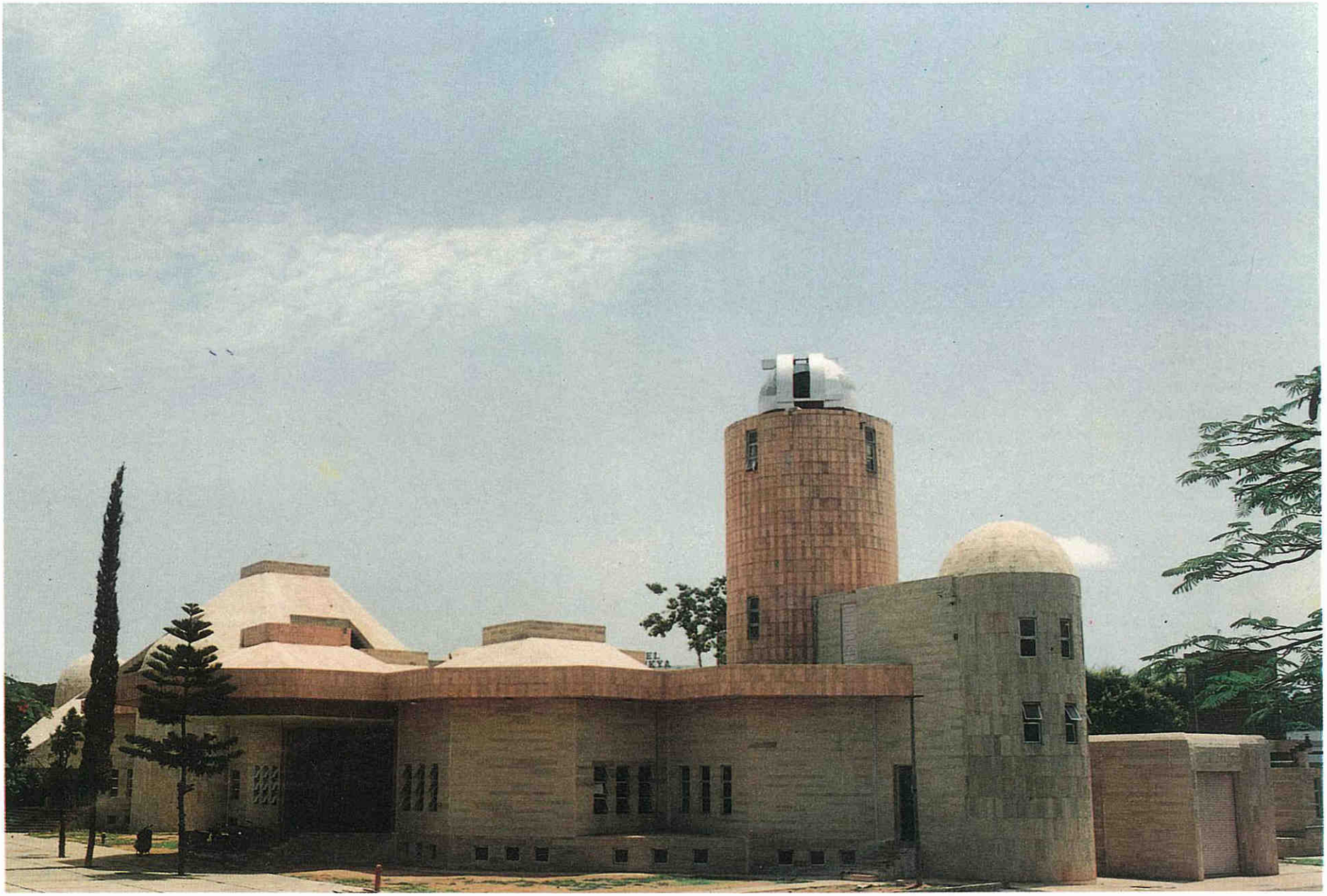



PLAN

Dome revolves like a planet



## FOOD CRAFTS INSTITUTE, BHOPAL (1985-88)

*Architect:* Sen Kapadia, Bombay.

The Food Crafts Institute with a built-up area of 3,240 square metres is located on a 0.80-hectare strip of land on the outskirts of Bhopal.

The design brief called for a main institution building accompanied by separate hostels for boys and girls. The main building has three distinct zones for administration, classrooms and demonstration kitchens. These zones are separated and expressed on plan by major and minor circulation routes. The design strategy of fragmenting the programme enables the making of low-rise smaller volumes along the inner street-like corridor, instead of a singular large building. All wings are located on an east-west axis, providing north-south exposure. The southern side is constricted and the northern facade enlarged. This provides the double advantage of cutting out the heat and glare and inducing air currents.

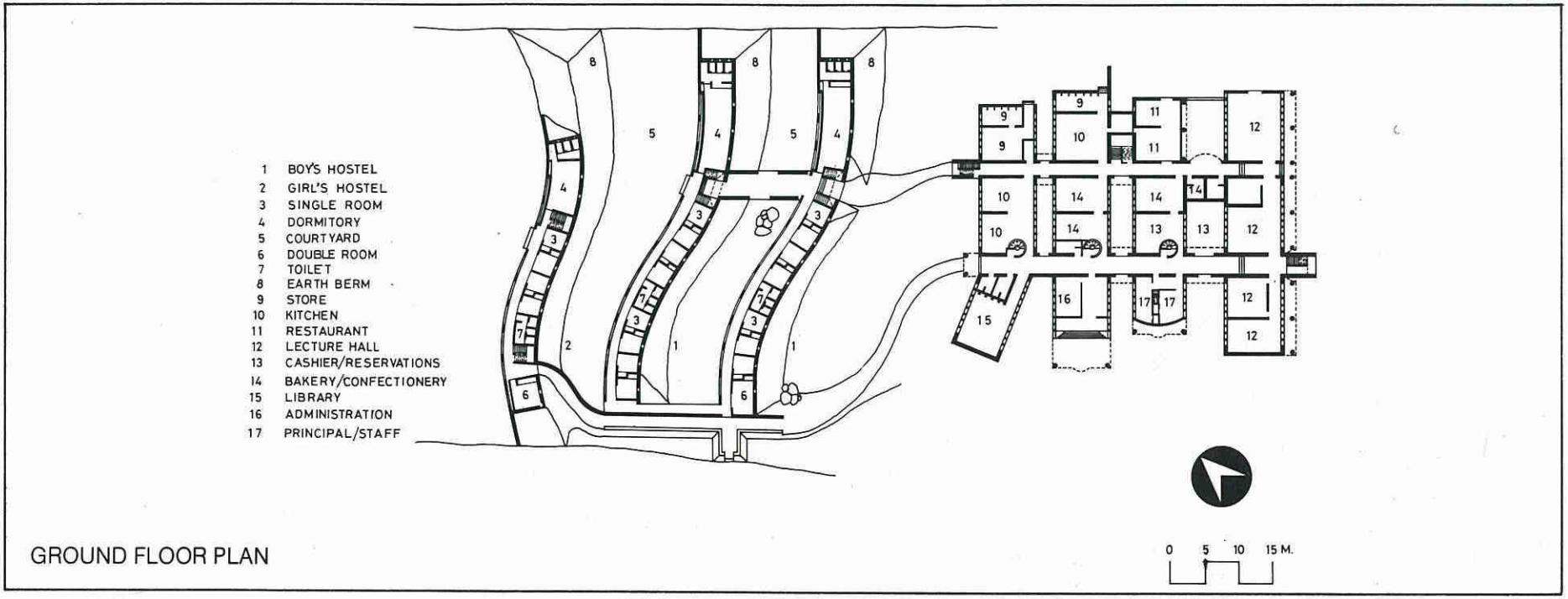
The narrow courtyards ensure that the buildings shade one another. Cavity walls with minimum openings are provided on the western side. The sloping roof is designed for solar collectors and drainage of water from sprinklers which are provided on the roof top for cooling by evaporation during summer.

The formal, main entrance porch extends out towards the ground for emphasis. The first wing suddenly angles away from the rectilinear geometry, thereby making the porch more inviting. Most of the built spaces have a mezzanine level which is approached from within by an internal staircase. Two main stairs are provided at either end of the two corridors that form the main circulation spine.

There are three hostel blocks—two for the boys and one for girls. These hostels are also oriented for north-south exposure. All rooms are approached through a single-loaded corridor which runs on the north side. The curvilinear forms of these blocks are softened by earth berms on the southern side.

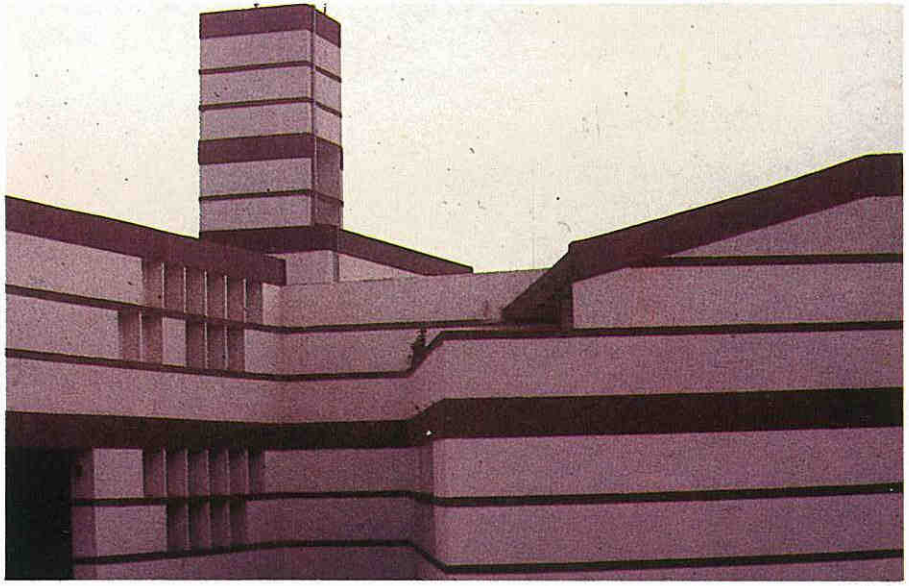
Multi-dimensional images of linearity

The building has a composite structure of reinforced-concrete frame and load-bearing brick walls. The external surfaces are stucco finished and painted.




GROUND FLOOR PLAN

Harmony of opposites: Verticality balanced by horizontality



Food for thought: Plasticity of the hostel

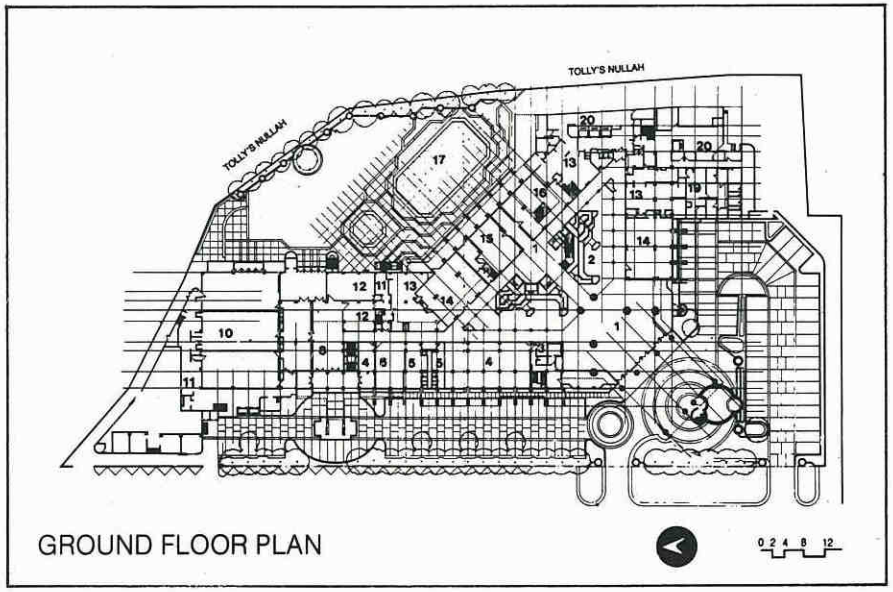
## TAJ BENGAL HOTEL, CALCUTTA (1985-89)

*Architect:* Ajoy Choudhury, Sabikhi and Choudhury Architects Private Limited, New Delhi.

Calcutta's Taj Bengal Hotel is built on a 1.6-hectare site on Belvedere Road in the lush green residential area of Alipore. The building has 23,270 square metres of built-up area and accommodates 250 guest rooms, restaurants, a bar, function areas and a banquet hall, business centre, swimming pool, health club, etc.

The building form is dictated by the shape and location of its site. While establishing a contextual relationship with Calcutta's colonial backdrop, the building keeps pace with stylistic trends in the West. An attempt has been made to so design the building as to endow it with a definite sense of place and history. The architect has evolved a blend of the vernacular, classical and international styles.

The height of the structure has been kept low so as not to disturb the flight of a large number of migratory birds to the lake in the adjoining zoo. To enhance the visual effect of the building, the top storey projects out and the red-tiled sloping roofs are extended as a decorative element which is very typical of Bengal. At the two extreme ends, the structure steps back to accommodate terraces, which are enlivened with greenery. To integrate it with the garden environment of the zoo, the site has been extensively landscaped. In the humid climate of Calcutta, plants grow easily. Therefore, plant-pots are provided on the terraces and in front of windows to soften the impact of the built-form and to present a pleasant foreground to the view from each room. The rows of windows indicate the guest rooms and mark the floors in a rhythmic geometric pattern. Recessed mouldings around the glazed windows give a corrugated effect to the white stucco facade and enhance the play with light and shade.



GROUND FLOOR PLAN

Rhyme of recessed mouldings

*Taj Bengal Hotel, Calcutta* **187**

## TRIVENI TIRATH CAMPUS, KALSAR (1985-89)

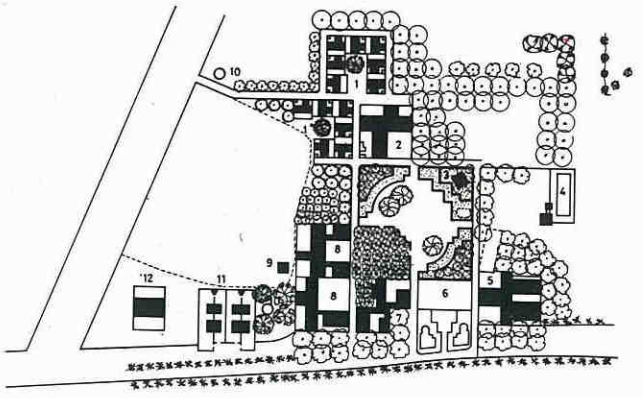
*Architect:* Satish N. Madhiwalla, Bombay.

Modelled on the ideals of the educationist Manubhai Pancholi, the Triveni Tirath residential and academic campus in Kalsar village in Bhavnagar district of Gujarat is intended for rural education. The total area of the site is 10 hectares, which includes the experimental fields beside the buildings.

The buildings are kept on a higher level—on fallow land where limestone is near the surface, thus considerably reducing the foundation costs and exploiting natural drainage. All the campus facilities are placed around a central communal space on which existed a coconut and palm plantation. The individual buildings are related to this space, their ancillary facilities arranged in four radial arms in a *swastika* pattern. The existing plantation divides the campus into distinct public and private zones. All the public facilities are directly reached from the access road. The faculty houses and the girls' hostel are placed beyond a green, in an interior private zone. The campus is also divided into distinct activity zones. All the facilities for academic activity are east and south of the central quadrangle, while all the facilities for extra-curricular activities are located in the north-west.

The spaces are multipurpose in order to meet the varying requirements. A classroom during the day becomes a dormitory at night. The *Gaushala* is a laboratory for animal husbandry and provides milk as well as fuel and manure through a *gobar* (cow-dung) gas plant. Architectural oppositions like built-form and open space, light and shade, solids and voids, are all orchestrated and highlighted for a wide typology of the space. The entire site is densely planted with fruit-bearing and flowering trees, which provide not only wood but also an ideal setting for rural education.

Limestone, which is locally available and is the most economical material in this region, is extensively used. The foundations are constructed in limestone with lime mortar to avoid termite infestation. Limestone with mud mortar is employed for the walls above the plinth level. Mangalore tiles supported on wooden members are used for the roofing. The walls are permanently finished on the external sides, by mixing coloured earth like *geru* and *raysenna* with cement and lime in the final coat of plaster. The doors, windows, eaves and metal shutters are coated with complementary enamel paint. Their proportions vary from area to area to ease identification.

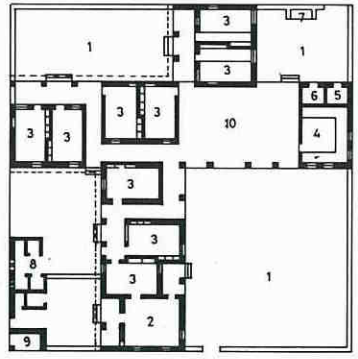


1 FACULTY
2 GIRLS HOSTEL
3 WATER TOWER
4 SWIMMING POOL
5 GUEST HOUSE
6 PROPOSED ADM. BLOCK
7 LABORATORIES
8 BOYS HOSTEL
9 BOYS BATH HOUSE
10 GOBAR GAS PLANT TOILET
11 STAFF HOUSING
12 GAUSHALA

0 8 16 32 64 M

SITE PLAN

GIRLS' HOSTEL



1 COURTYARD
2 STAFF ROOM
3 ROOM
4 KITCHEN
5 FIRE WOOD
6 STORE
7 WASHING PLACE
8 TOILET
9 OTLA
10 DINING

0 1.5 3 7.5 M

GROUND FLOOR PLAN

Confluence of rural education:
Triveni Tirath

Rooting life in the grass: Residences

Role model for a rural school

## PUNJAB ARTS COUNCIL BUILDING, CHANDIGARH (1986-87)

*Architect:* S.S. Bhatti, Chandigarh.

The Punjab Arts Council building is located on the fringe of Chandigarh's well-known Rose Garden. The overall form of the building has been regulated by the city's byelaws, restricting the total height to 10.67 metres above the road level. The architect has attempted to express the grandeur of the personality of the Council's founder, Dr. M.S. Randhawa, by adopting a monumental scale.

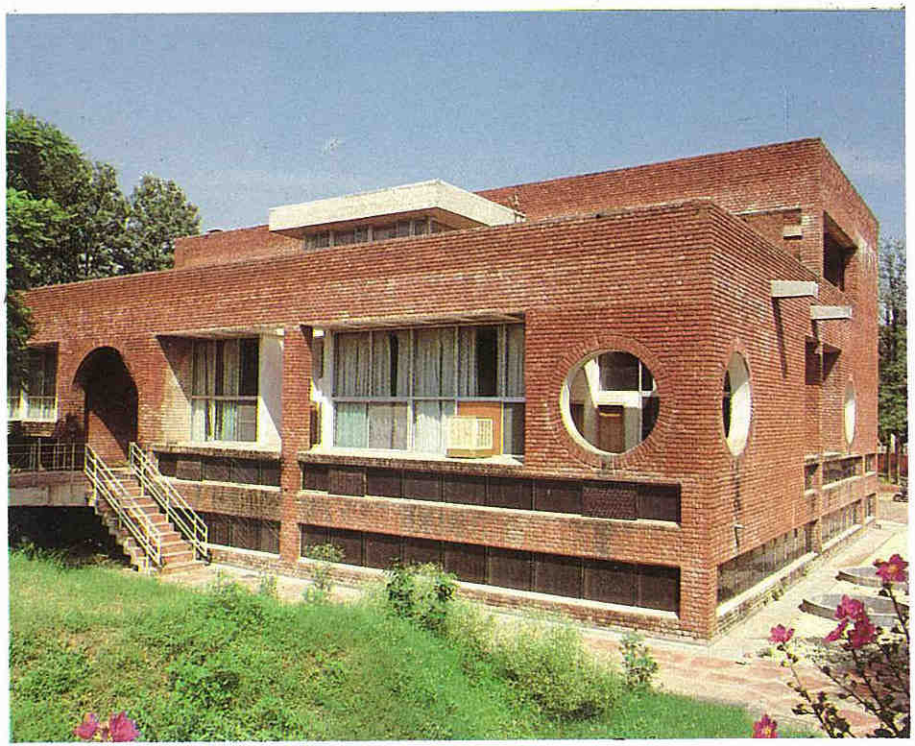
The architectural expression comprises sculptural masses with "silent facades" in exposed brickwork, punctuated by a few carefully placed openings. The interior space is conceived as a self-renewing continuum and not as compartmentalised sections. Large column-free spaces inside have been made possible by the use of a coffered ceiling. In spite of its monumental character, a certain delicacy in the formal concept has been achieved by extending the interior spaces through glass-walls to the exterior panorama of colour, texture and fragrance.

The brick-mural on the entrance wall expresses in large bas-relief the creative unity which underlies all forms of art.

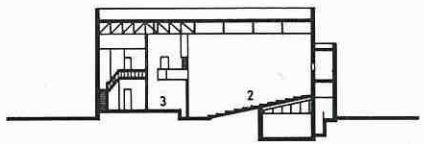
The building, with a total built-up area of 767 square metres, houses the offices of the Council and the three *Akademies* which function under its control.

An art gallery, store and record room have been kept at the semi-basement level which is illuminated by a clerestory on three sides. The ground floor provides accommodation for the officials of the Council and the *Akademies*, a staff room, a conference room, a kitchenette and toilets. The double-height library is also placed on the ground floor. The mezzanine floor is extended to form three separate cabins for


Levels of exhibition: Exhibition hall



Nourishing art artistically: Punjab Kala Bhawan

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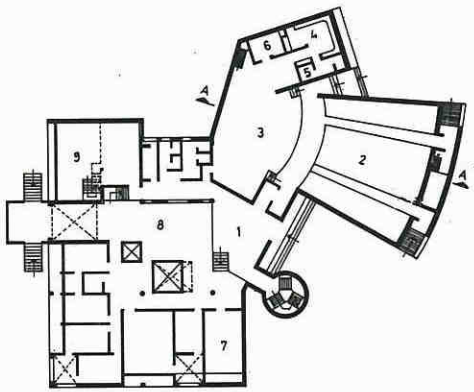
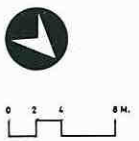
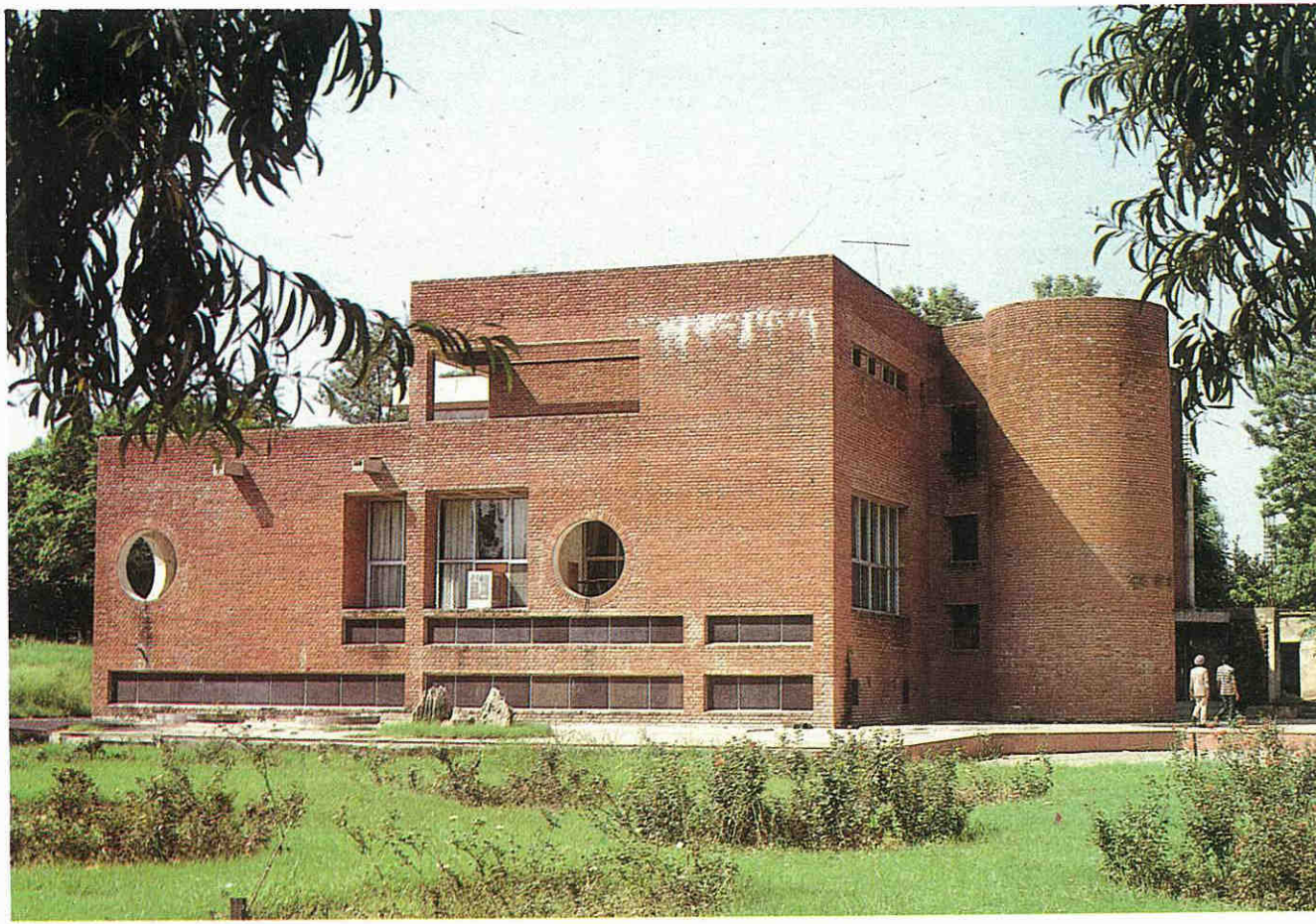



1 FOYER
2 AUDITORIUM
3 STAGE
4 DRESSING ROOM
5 TOILET
6 STORE
7 OFFICE
8 LOUNGE
9 LIBRARY




GROUND FLOOR PLAN



Fragrance of brick amid roses

Punjabi folk music. An auditorium with a seating capacity of 250 is connected to a triple-height common foyer. The first floor has rooms for visiting artistes, accommodation for the caretaker, toilets and a store. A lounge for visiting artistes is part of the large terrace facing the Rose Garden. Art workshops organised during the winter are held on the terrace. The cutouts at various levels ensure an uninterrupted flow of spaces, both vertically and horizontally, and symbolically establish the unseverable relationship among all the arts.

The reinforced-concrete-frame structure of the building is clad in exposed brickwork which gives it an organic, earthy, and austere look.

## SWIMMING POOL, PANCHGANI (1986-87)

*Architect:* Shirish Beri, Kolhapur.

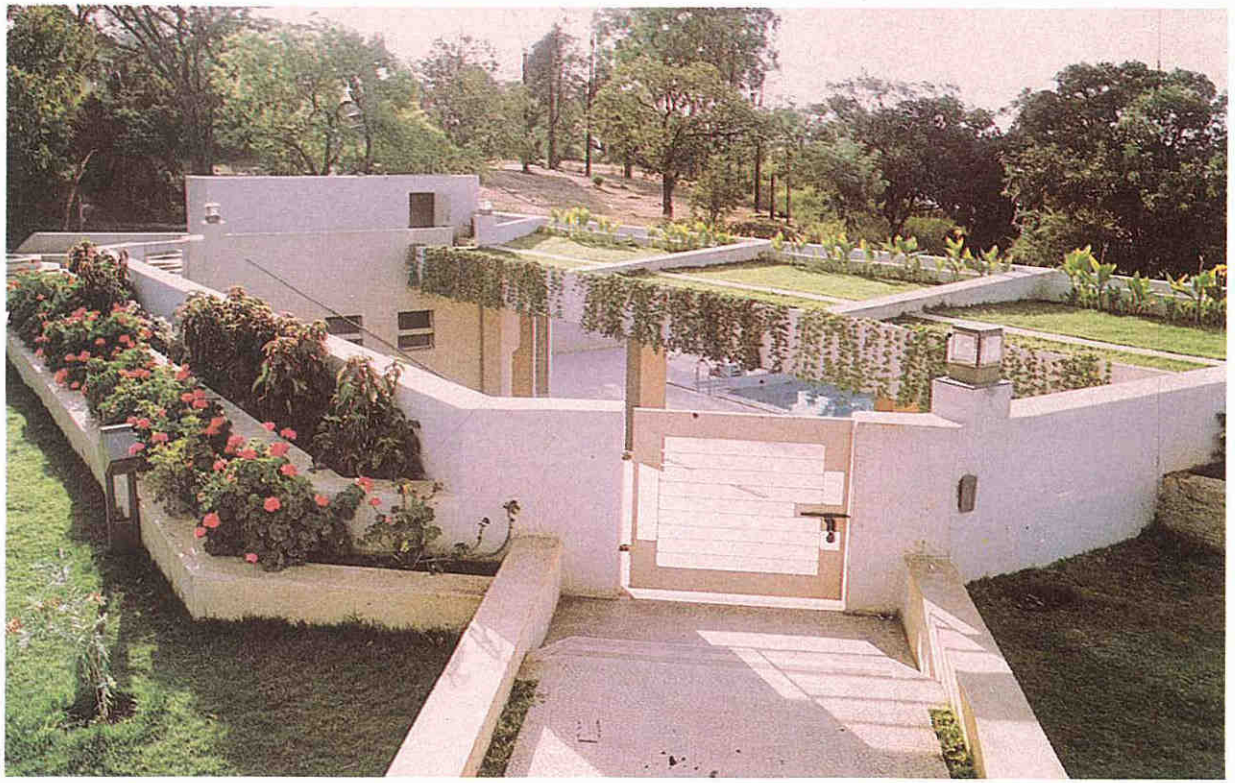
The swimming pool of the Sanjeevan Vidyalaya in Panchgani in the Satara district of Maharashtra covers an area of 23,000 square metres. It lies on the edge of a hill and commands a fascinating view of the valleys and mountains around.

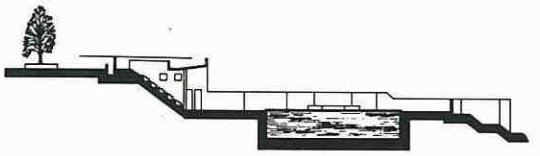
The architect took a fancy to this location because the surrounding pastoral landscape and the steep and lofty cliffs could provide a dreamland environment for the pool. A low wall on the valley side allows for a good view from the pool deck. Utilities like changing rooms, toilets and the filtration plant have been sunk into the ground and thus become non-buildings since they cannot be seen from the main site above. The ground over the slabs of these structures forms a continuum of gardens. This allows for an uninterrupted view for the other existing buildings on the site.

The pool thus acts as a landscaped element without creating any structures above the ground level.

All buildings had to be designed as frame structures due to the unavailability of good strata and due to seismic problems.

Site–structure rhythm





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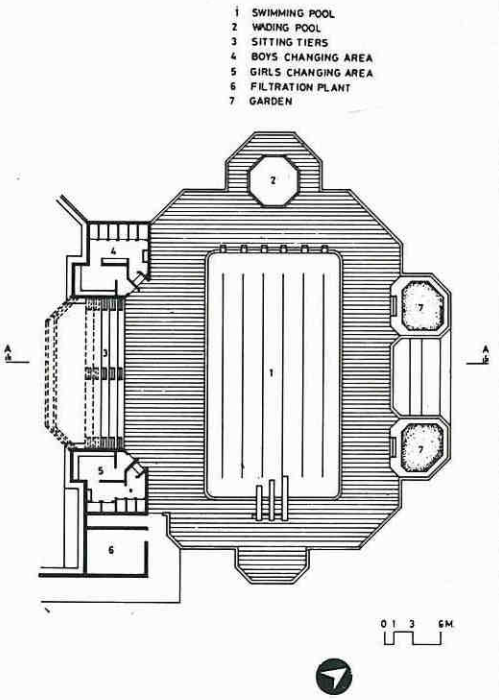
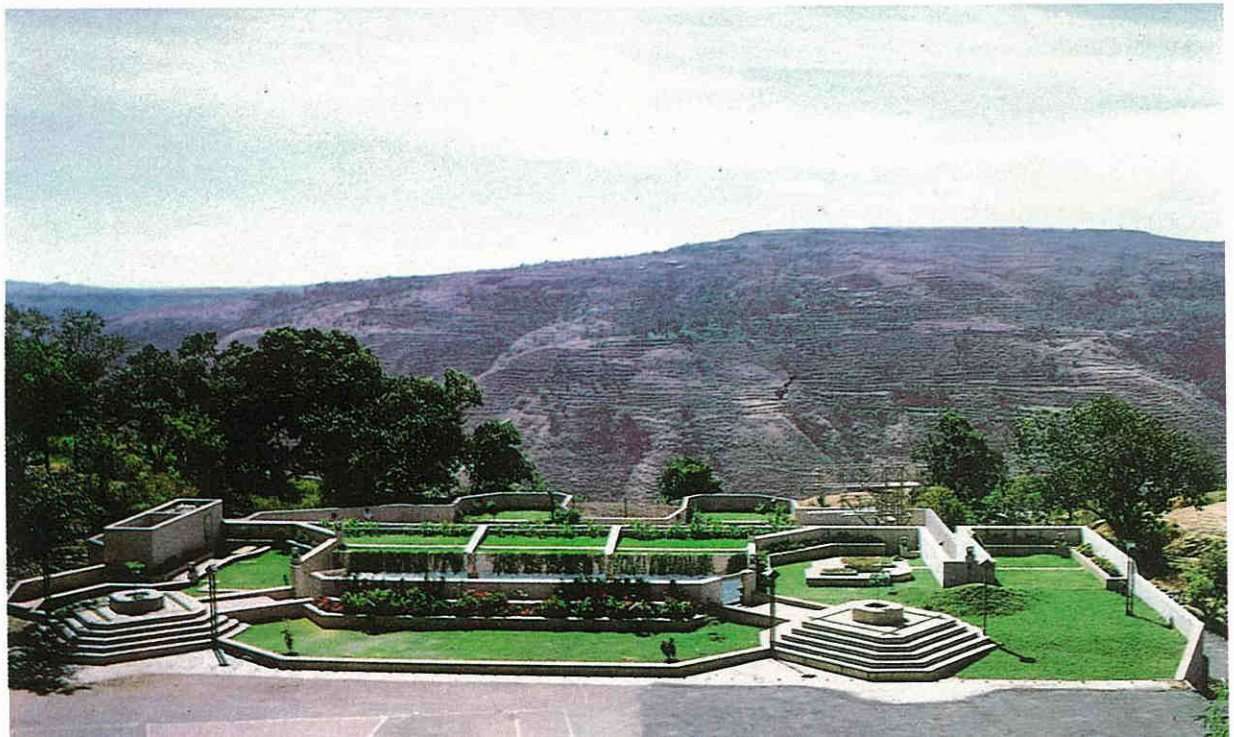



PLAN

Shut from onlooking glares



Backdrop of hills

## COMMERCIAL COMPLEX, TRICHUR (1986-88)

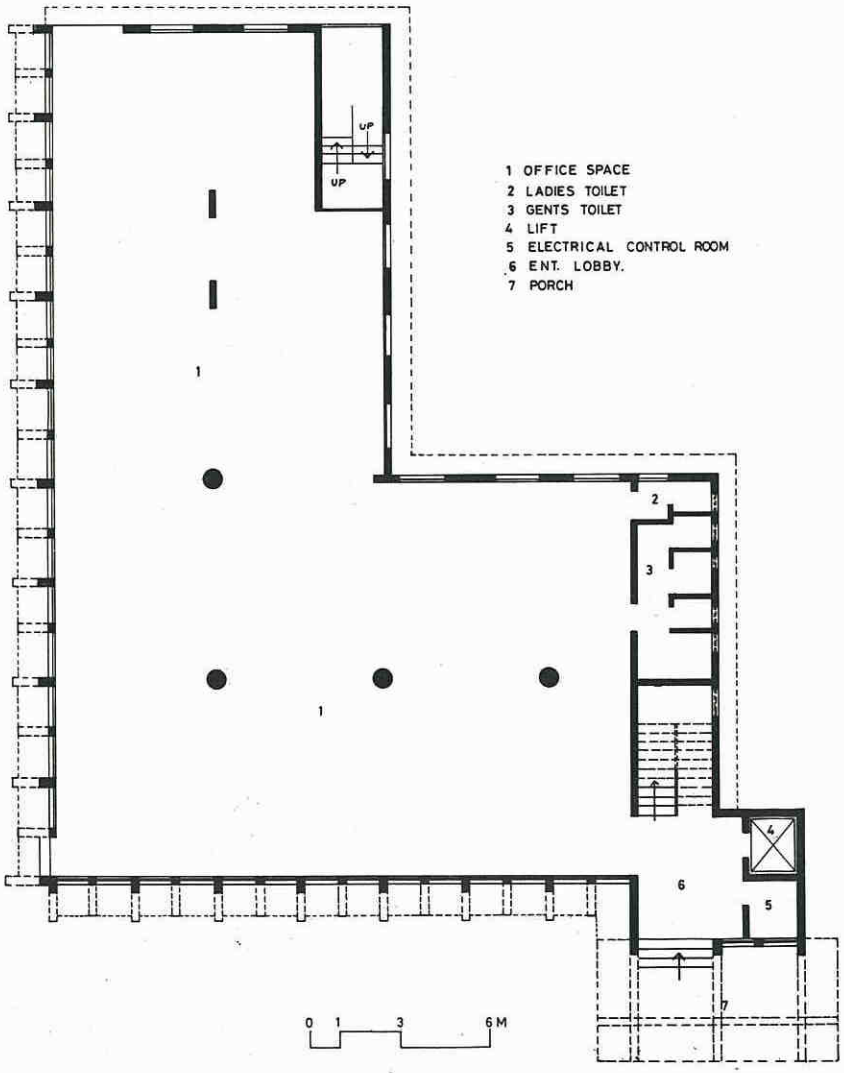
*Architect:* Enarc Consultants, Trichur.

The authorities concerned of Paramekkavu Devaswom, a temple in the heart of Trichur in Kerala, developed a commercial complex on a 0.40-hectare plot on the south-west side of the *gopuram* (gateway) of the temple. The five-storeyed building has a total built-up area of 2,430 square metres.

A directive from the government stipulated that the planning of this building should appropriately match the architecture of the temple. The architect thus conceived its design to maintain harmony with the nearby temple structure.

The elevation of the building is proportionate to the *gopuram* of the temple. A sloping roof with the *mugappu* (dormer-projection) is in tune with the top of the *gopuram*. With the same objective, clay tiles are laid over this roof, serving the dual purpose of visual harmony and insulation from the heat. All external columns are corbelled to match the appearance of several temples in this region. This style is further improved upon by the presence of suspended precast-concrete ornamental motifs from the corbels. The sloping sunshades finished in decorative clay tiles help to maintain the same character. The direction of the external columns on the northern and eastern sides was consciously decided upon to provide adequate support for the projecting corbels. The external colour scheme of the building was also chosen to match that of the existing temple.

The plot of land has been used to the optimum by adopting an L-shaped configuration. On the ground floor, space has been reserved for administrative work. All the upper floors are used as rental accommodation for a bank. The services comprising lifts, stairs and toilets are planned near the north-west corner.




GROUND FLOOR PLAN

Hard laterite, which is available at shallow depths at the ground level, has been utilised for the foundations of the columns, which helped in bringing down the overall cost of the building.

Commerce's respect for God's abode

## KUFRI RESORTS, KUFRI (1986-88)

*Architect:* S.D. Sharma & Associates, Chandigarh.

Located at Kufri, a few kilometres from Shimla in Himachal Pradesh, the Kufri Resorts project was started to provide quality accommodation to tourists out for winter sports. The 12-hectare site, amidst cultivated fields, slopes steeply into a valley. The total built-up area of all the component structures is 2,715 square metres.

The architect conceived the design to suit the stiff slopes of the hills and retain the panoramic view of the valley. Each building has a different geometric profile, arising directly out of the site's contours. As such, there is no manipulated attempt to "matchmake" plans. The roof is the only element which binds different structures together in a visual sequence.

Kufri Resorts comprise a hotel building, a restaurant block, independent cottages and a shopping arcade. All the buildings spread out organically, evolving out of the terrain against the backdrop of snow-covered mountains.

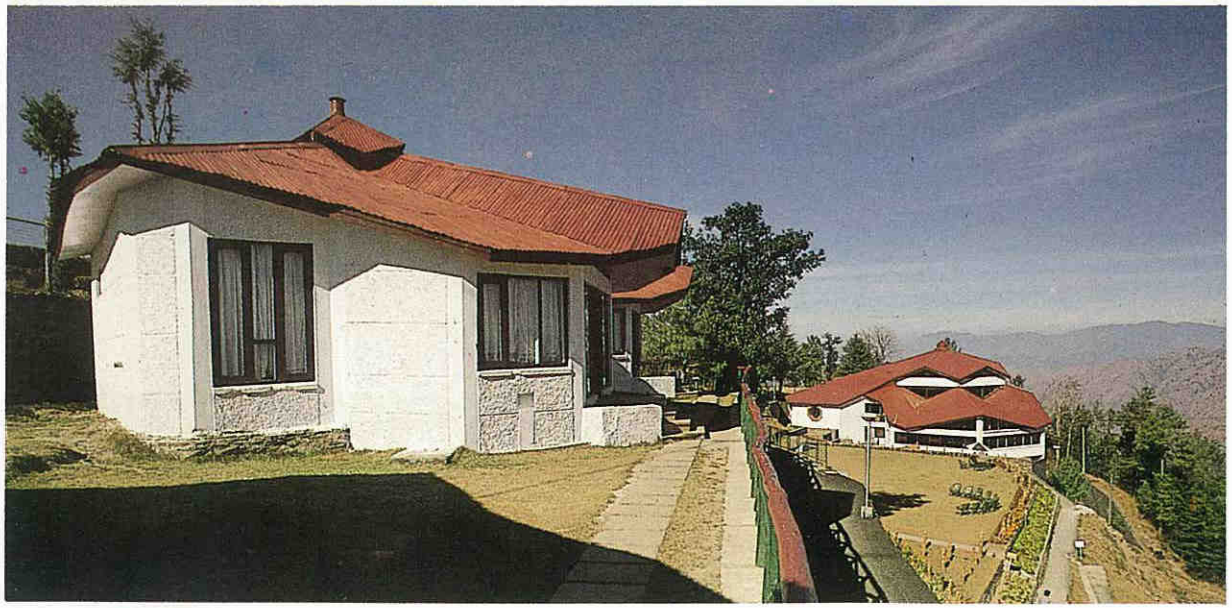
The hotel building is designed around a curve of the hill, so that one does not lose view of the natural surroundings even when one stares inside the building. The hotel contains 40 rooms which too are aligned to the land contours. All the rooms get a full view of the scenic surroundings. The skylit internal garden has a fibre-glass roof, supported on trusses.

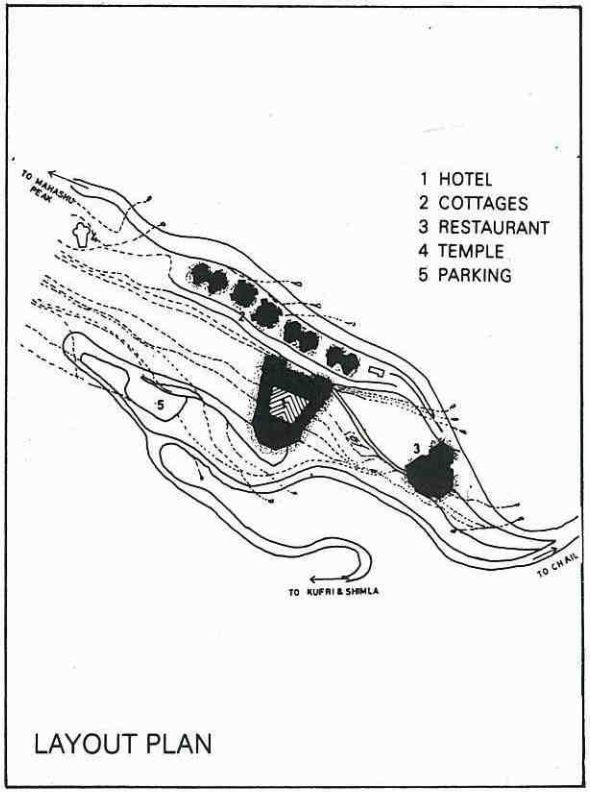
The restaurant block contains two restaurants and a beer bar. It is a hexagonal structure, wrapped with glass windows and with an interesting form of roof profiles. This block stands in majestic contrast to the other visible structures. A deck for outdoor seating is appended to the restaurant block.

In the cottages, a central fireplace in the living room heats up all the adjoining rooms through metal air containers at the side of the fireplace.

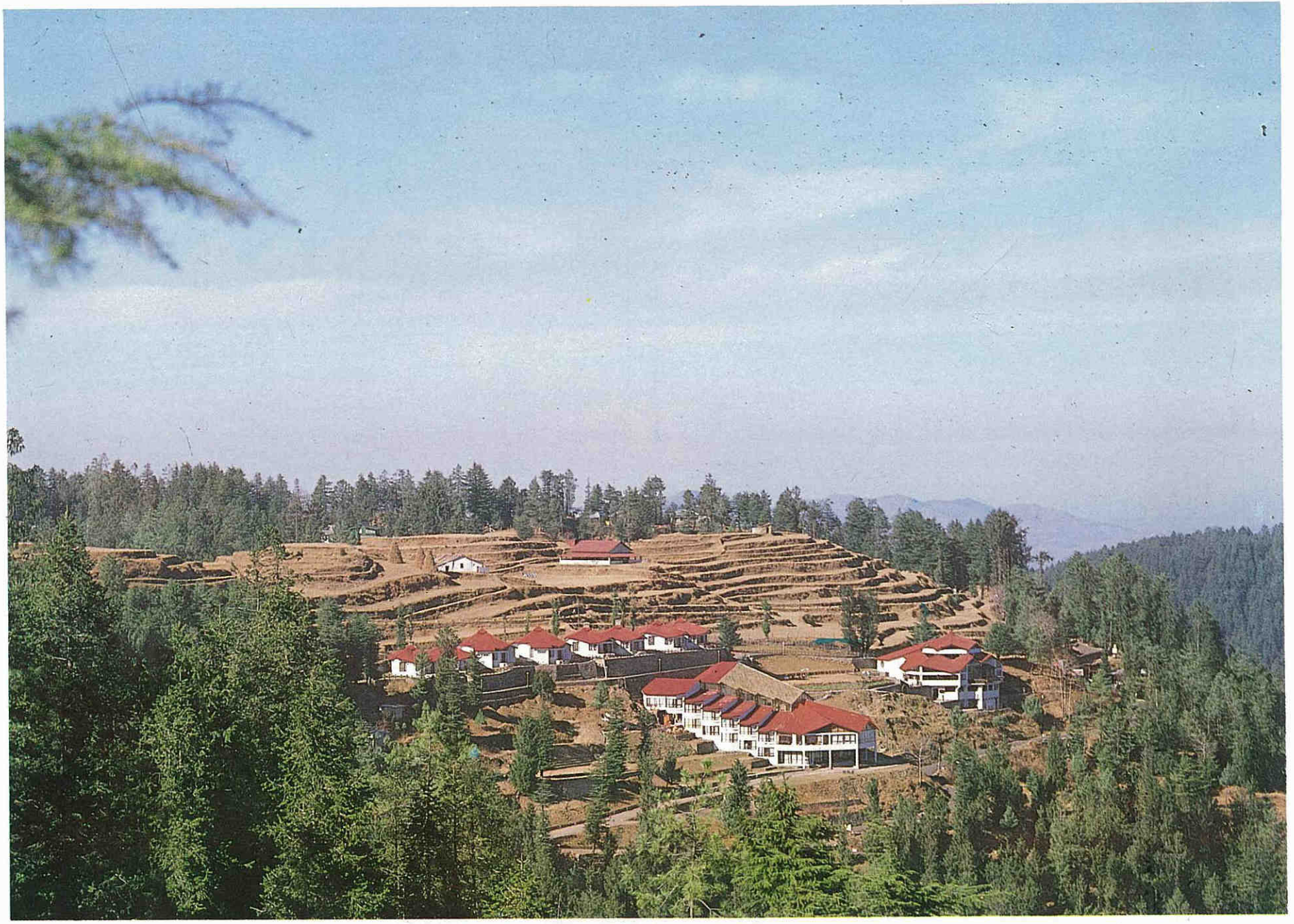
All the buildings are finished with rough-cast plaster and washed in white on the external sides. The interiors are plastered and painted. For the roofing, tin sheets, painted red, are supported on steel and reinforced-concrete trusses. Brick has been used for the walls. Kota stone dominates the circulation areas, whereas the restaurants are enlivened by parquet flooring.

Building in consultation with nature.

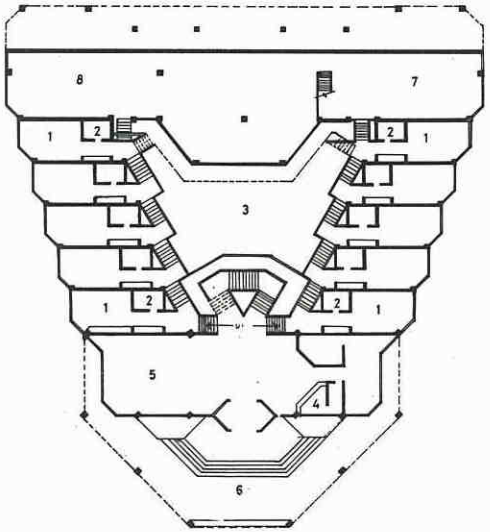





LAYOUT PLAN



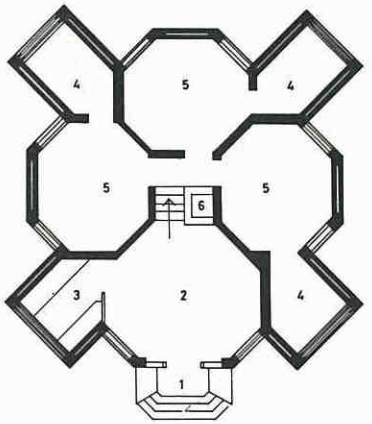
HOTEL BLOCK




1 ROOM
2 TOILET
3 GARDEN
4 RECEPTION
5 LOUNGE
6 PORCH
7 GAMES ROOM
8 HEALTH CLUB

GROUND FLOOR PLAN

THREE-BEDROOM COTTAGE

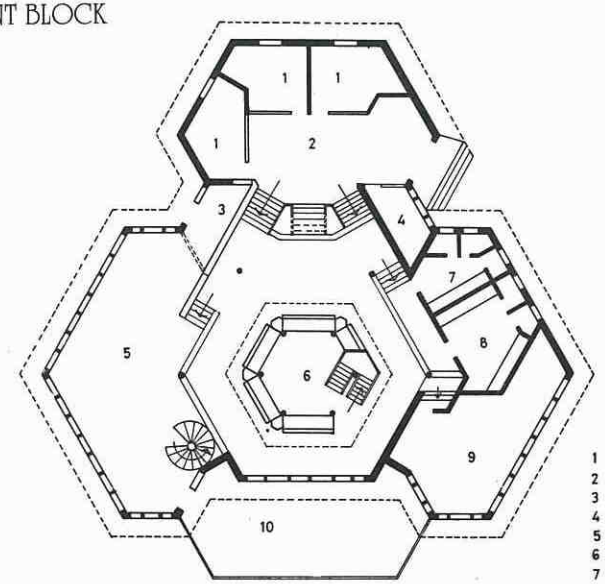



1 ENTRANCE
2 DRAWING CUM DINING
3 KITCHEN
4 TOILET
5 BED ROOM
6 FIREPLACE

PLAN

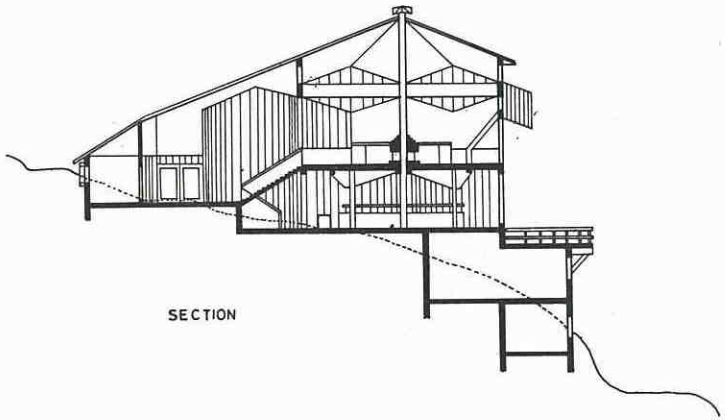
Internal court of the Hotel.

RESTAURANT BLOCK

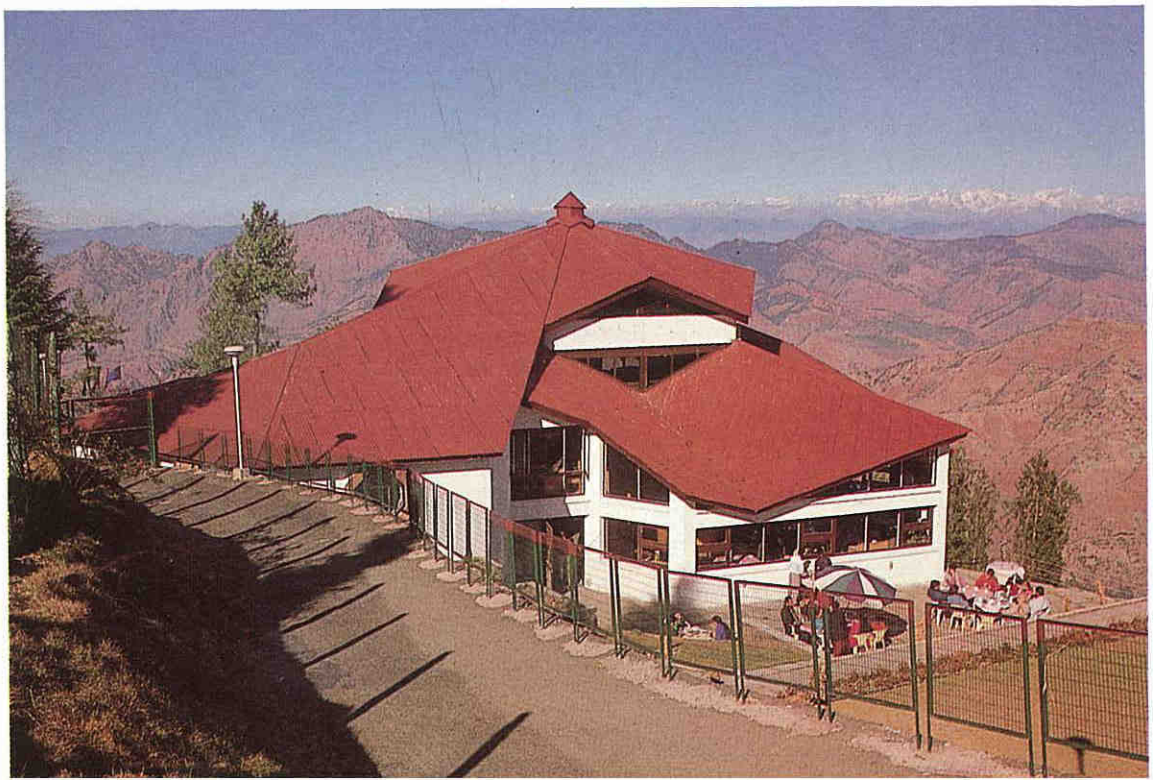



PLAN

1 SHOP
2 ENT. FOYER.
3 BUFFER
4 CLOAKROOM
5 SEATING AREA
6 SATELLITE KITCHEN
7 LADIES TOILET
8 GENTS TOILET
9 DISCOTHEQUE
10 DECK.




SECTION



Restaurant: Interplay of sloping roofs

## STAFF HOUSING, NEW BOMBAY (1986-88)

*Architect:* Sudhir Diwan, Bombay.

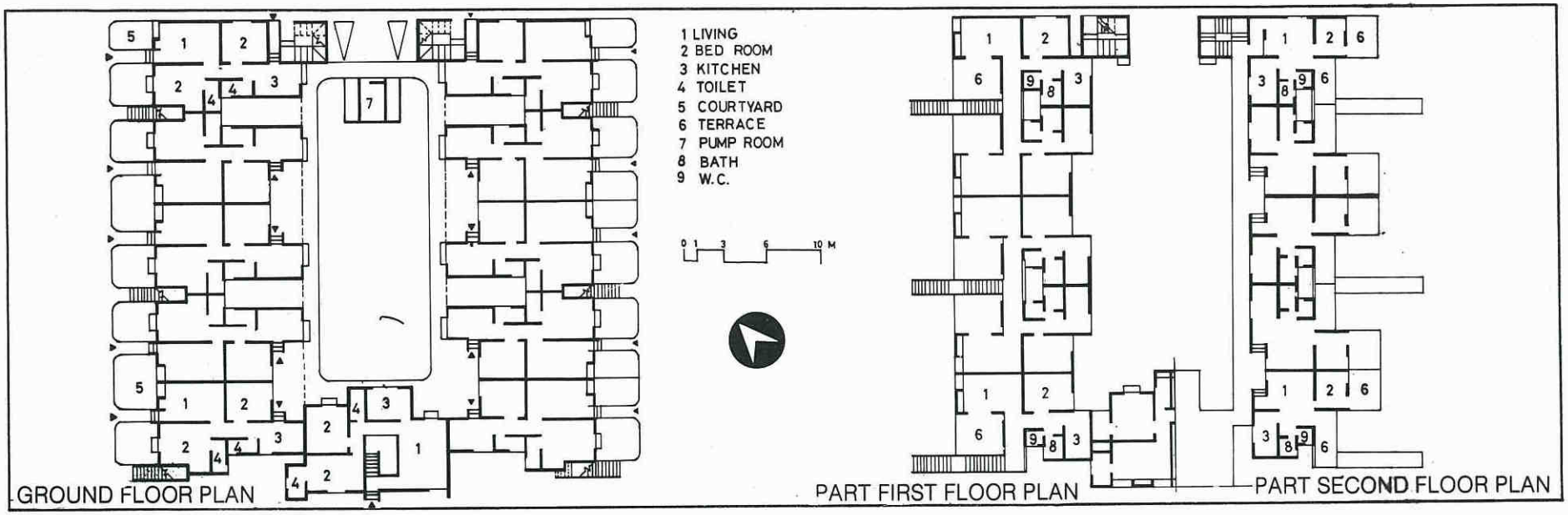
The housing for the staff of the International Institute of Population Studies, Nerul, New Bombay, is constructed on an area of 1,900 square metres. The site is surrounded by low-rise, high-density housing units.

Two wings running parallel to each other contain 30 dwelling units. Two units join the wings at one end. The other end is kept open for access to the resultant courtyard. Two-bedroom units for senior faculty members are located on the ground floor, each with its distinctive patch of green turf and separate pedestrian access. These units also open out on the rear side to the community courtyard which contains sit-out spaces and an enclosed playing area for children. One-bedroom units for junior faculty members have been provided on the first floor, approachable by a single-flight staircase. Each unit has an individual terrace and opens out on both sides for cross-ventilation. Above these are single-room tenements which are approached through separate staircase blocks positioned in the courtyard. Single-loaded corridors on a level lower than the dwelling-entrance level provide greater privacy.

Openings are provided along the east-west axis to catch the prevailing breeze. To cope with the heavy monsoons in this region, all the openings are protected with projections and deep recesses.

Facades of delight

Smoothness merging with aesthetics



## CENTRE FOR DEVELOPMENT STUDIES AND ACTIVITIES, PUNE (1986-90)

*Architect:* Christopher C. Benninger, Pune.

The Centre for Development Studies and Activities is located on the fringe of Pune City on a ridge overlooking the Bavdhan village. It is a place for interaction between intellectuals from several disciplines and students of the School of Development Planning and Management. The total covered area of the centre is 750 square metres in the first phase and 1,000 square metres in the second.

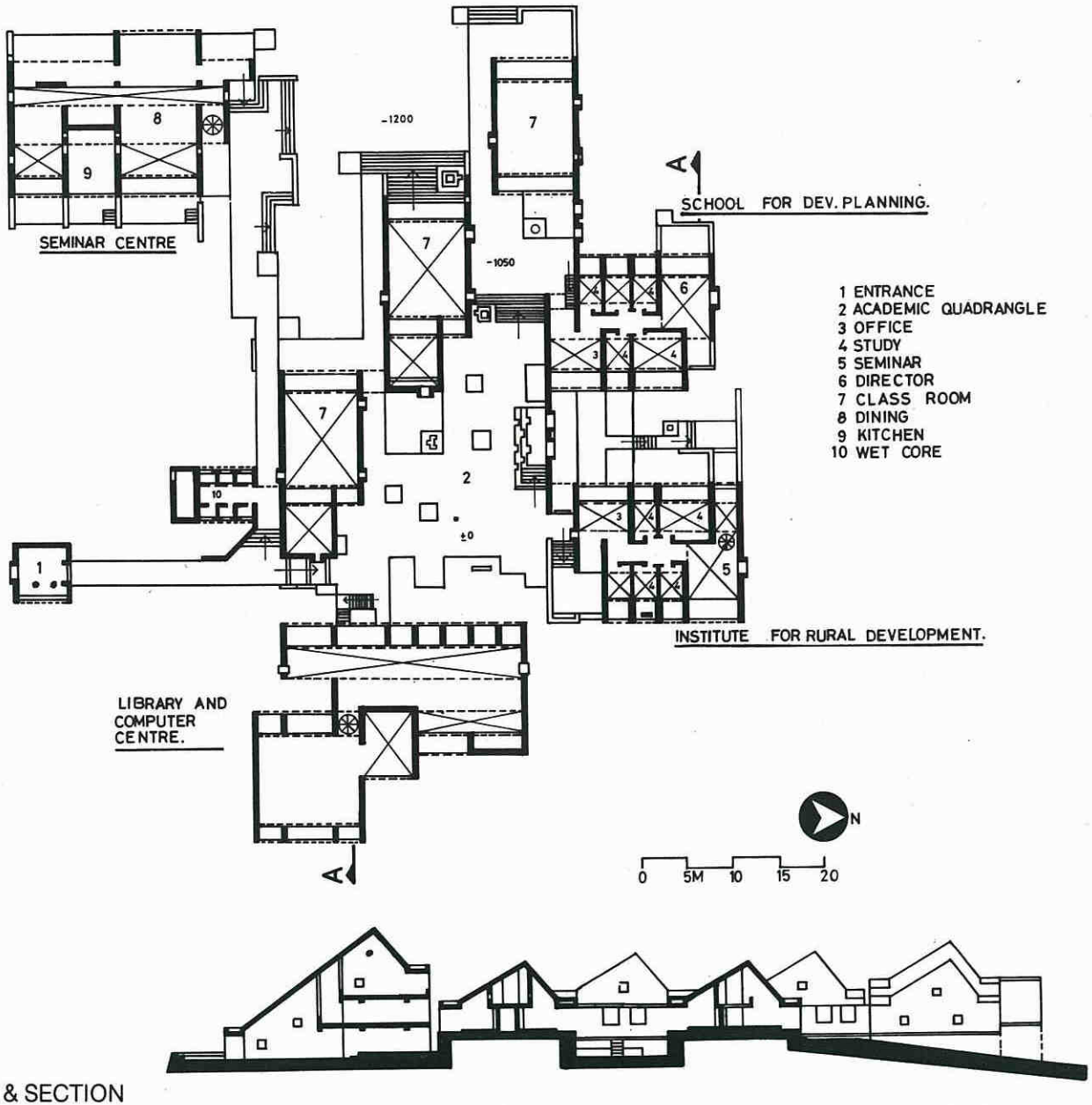
The complex consists of three lecture-cum-studio spaces, two office buildings, a hostel complex, a seminar centre and a future library-cum-computer centre. It has been conceived and planned on the concept of a classical Greek gymnasium, set in a suburban environment on a terraced hill slope. A podium, surrounded by a cluster of buildings, is the focus of this complex. The level of this podium is raised for scaling down the surrounding built-form. It is punctuated with traditional Indian elements like *ottas*, steps, elevated platforms with sculptures, and large earthen pottery.

The individual building components have been designed using vernacular forms such as tiled roofs and stone walls. These components have been grouped in a strict Cartesian pattern, with elongated spaces enclosed within parallel masonry walls. The enclosed spaces open out to the views of a hill range to the west and the growing metropolis of Pune to the east. All the individual building components have their own small "contemplative" court spaces which flow freely and are connected with the central podium through various visual devices in the walls. The wandering eye, consequently, moves from distant vistas up into the podium courtyard.

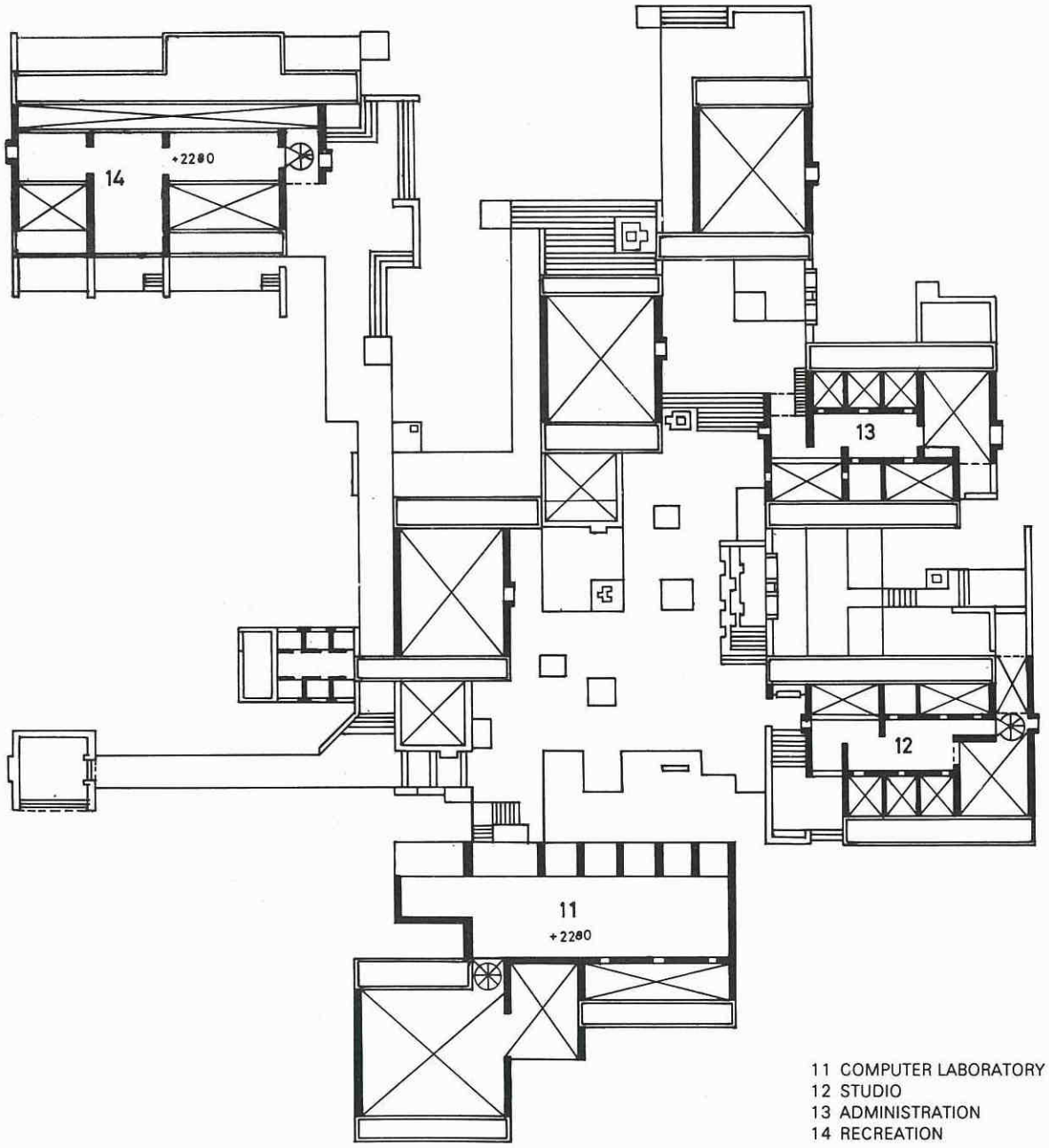
Thus the thematic structuring elements like the parallel stone walls, cross-beams supporting Mangalore-tile roofs and transparent panels lend the centre the discipline of an objective environment, while various motifs such as water spouts, window boxes, steps and *ottas* draw out of the structured patterns unexpected images and observations.

Low profile architecture : High profile development

All materials like stone, tiles and wood are left exposed in their natural colours and textures in order to exploit their inherent beauty, minimising the recurring cost of maintenance. The roofs slope more sharply towards the west in order to protect the structures from the heavy rains which blow in from the coast. The Mangalore tiles have been placed on wooden battens fixed with marine plywood and supported on steel structural beams spanning across the load-bearing masonry walls. The fenestration is protected by concrete boxes and verandahs. The indoor flooring is of polished Kota stone while that of outdoor spaces is of rough Shahbad stone.




GROUND FLOOR PLAN & SECTION




11 COMPUTER LABORATORY
12 STUDIO
13 ADMINISTRATION
14 RECREATION

MEZZANINE FLOOR PLAN

Vital communication

Empathy with grassroots

Bird tower for bird's eye view

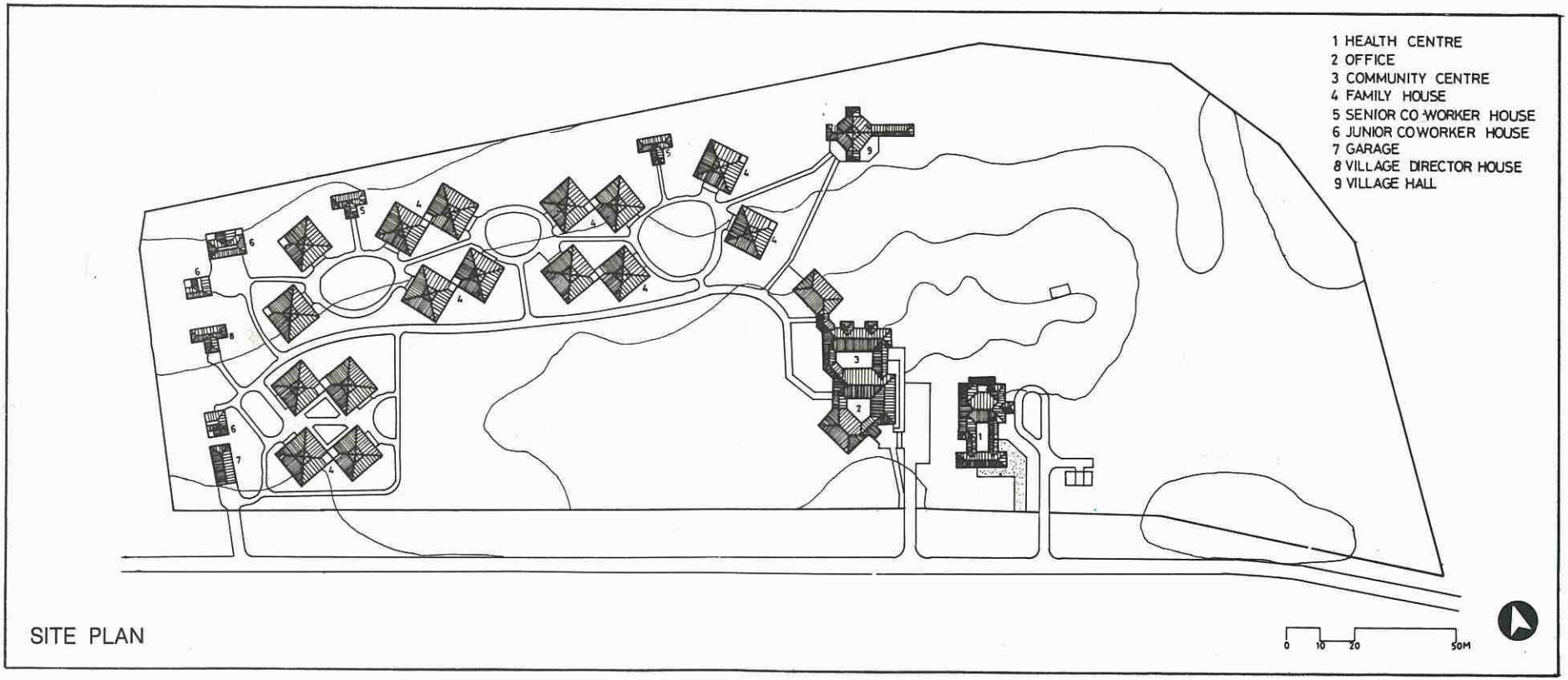
## SOS CHILDREN'S VILLAGE, BHOPAL (1986-90)

*Architects:* M.N. Ashish Ganju and Mark Warner, New Delhi.

To rehabilitate some of the children orphaned as a result of the Bhopal gas tragedy of December 1984, the SOS Children's Villages of India, a national voluntary organisation, established on the request of the Union Government a children's village on the outskirts of the city of Bhopal in Madhya Pradesh. The village is spread over an area of four hectares. It provides accommodation for 160 children in 16 family houses and has several associated facilities such as a health centre, a kindergarten, garage-cum-workshop and a community house with offices, shops, guest rooms and residences for the staff.

The family houses are arranged in clusters of four units, while the staff's residences; the kindergarten and the community house form the periphery around the playing fields. The houses and associated facilities occupy just over half the site and the remaining area is reserved for a high school which is envisaged to be constructed in the future. A system of footpaths connects the buildings together, while vehicular access and parking is controlled at the entry points. The natural slopes of the site are followed in locating the buildings to avoid cutting and filling and for effective drainage.

The construction technology adopted not only meets the need to express the "village" character of the campus but also the requirement of economy. The foundations and plinths are in local stone masonry, the walls are of brick with cement plaster and the roofing of Mangalore tiles supported on timber rafters held on a reinforced concrete ring beam. The doors and windows are of local wood, while the flooring is of Kota stone. Local stone slabs have been used for the pavements and paths. Extensive plantation of indigenous trees is proposed on the site.




SITE PLAN

For flights of soul: Levels of visuals

Playful environs for the children

Pastoral feel: Village

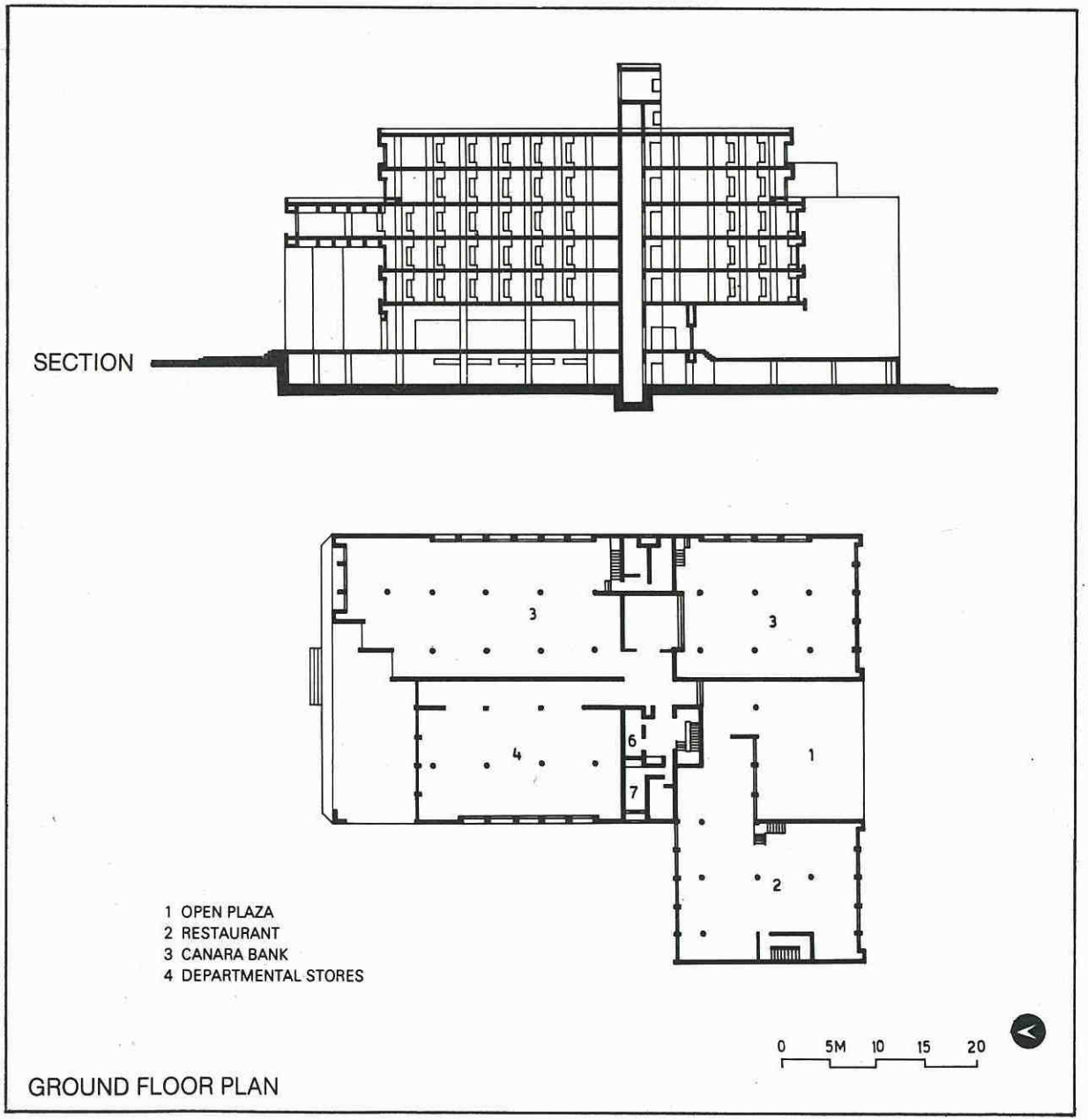
## OAKSHOTT PLACE, BANGALORE (1986)

*Architect:* Chandavarkar & Thacker, Bangalore.

The Oakshott Place complex is situated on Mahatma Gandhi Road in Bangalore, covering an area of approximately 3,650 square metres. The plot is 3.5 metres away from the road, all the way to the adjacent Church Street running parallel to it. The complex is a commercial development project with a departmental store on a part of the ground floor. The rest of the building has been taken by a bank for its offices. As this was one of the first major commercial development projects on Mahatma Gandhi Road, it was felt that the building should set a precedent for being a commercial complex different from a stereotyped one.

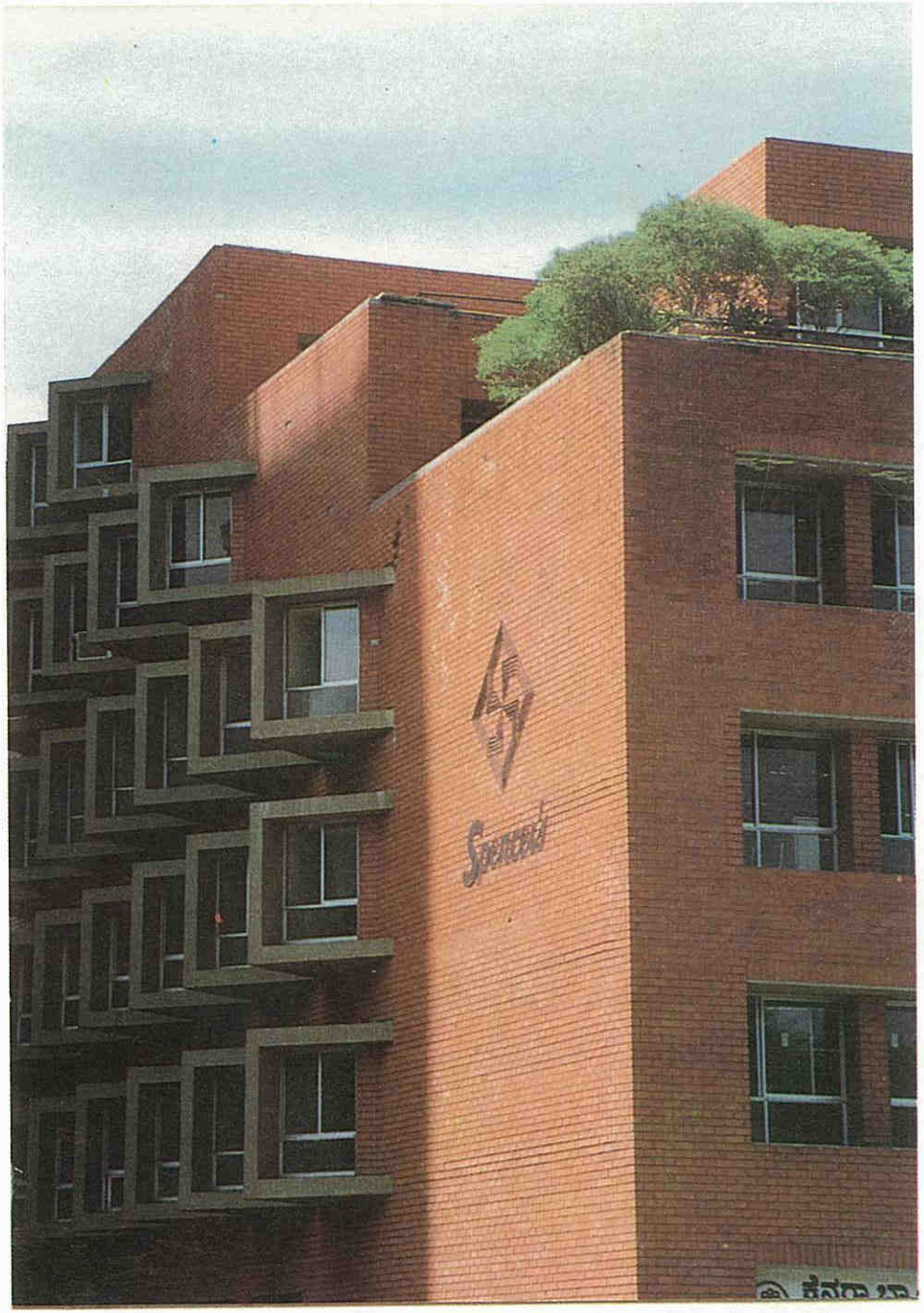
The complex, with a total built-up area of 12,400 square metres, was planned in such a manner that it could give the individual owners complete flexibility in arranging their offices and departments. The building height has been maintained at the fourth-floor level, but within the building envelope, on the road edge, is a triple-height plaza. This plaza has a picturesque landscape and space for mobile stalls. At the Church Street end there is a terrace which is used as an open-air restaurant. Due to the sloping site, the building has a natural basement which is accessible from the southern side for parking cars.

The building is a reinforced-concrete-frame structure with flat-slab construction. The windows on the east and west facades have been angled to face the north or south, not only to keep the direct sun out of the offices but also to provide a view towards these two directions. The external face of the building has clay tiles treated with a water repellent.



Double height of landscaping

Innocent exploitation of bricks



Integrating brick and concrete by roadside

## CENTRAL CO-OPERATIVE BANK COMPLEX, JALANDHAR (1987-88)

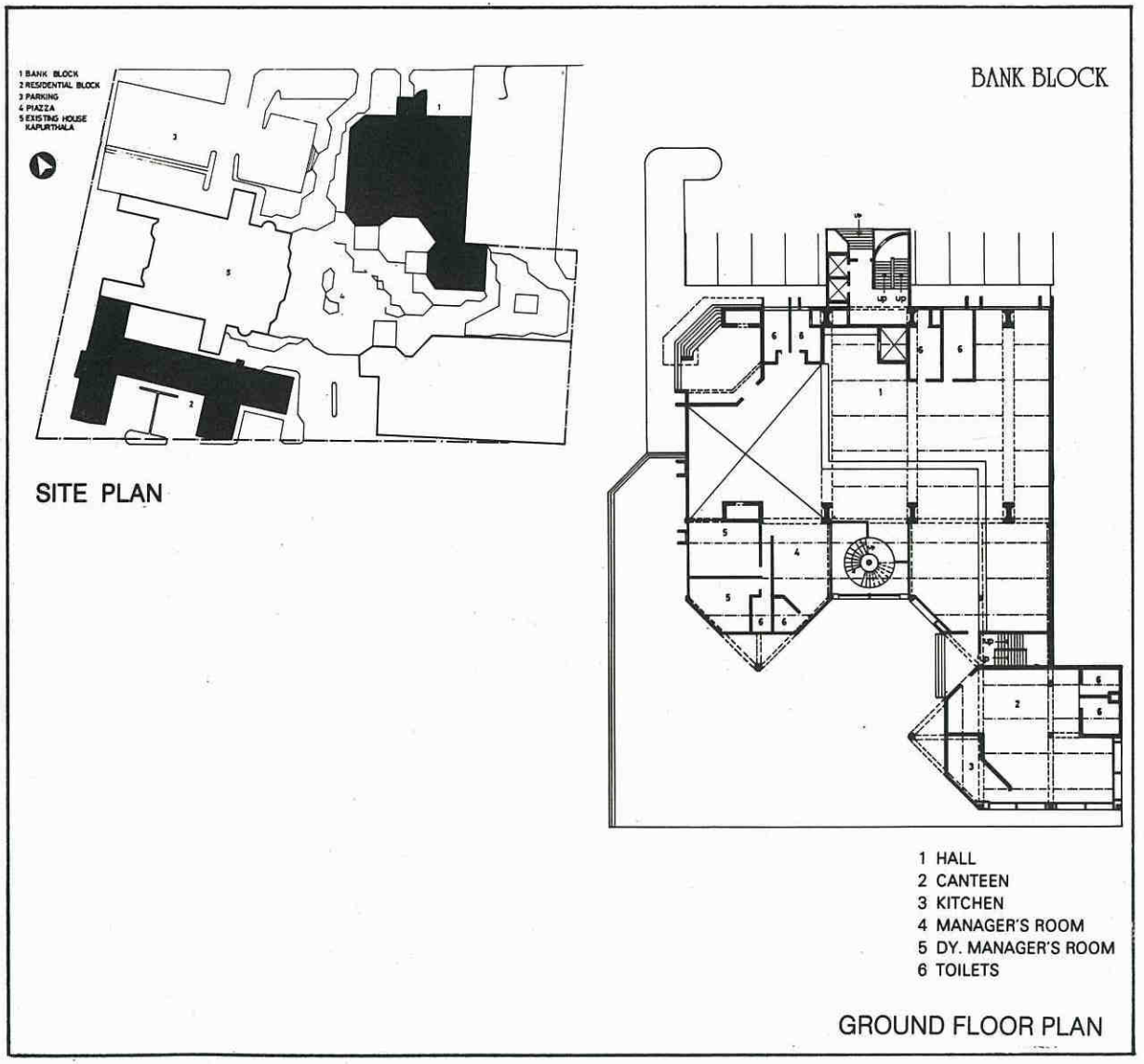
*Architect:* Anil Thakur, Designers' International, Chandigarh.

The one-hectare site of the Central Co-operative Bank in the heart of the Jalandhar city, near the General Post Office, is approachable from the 36-metre wide main road on its north-east and a 12-metre-wide neighbourhood road on its south-western side.

The layout has been evolved in a manner that highlights the Kapurthala House nearby and forms an architectural environment in which old and new built-up spaces can corelate and coexist. This has been achieved by creating a central piazza which integrates the Kapurthala House, the new bank block and a residential block instead of by imitating the architectural elements of the old building.

The six-storeyed bank block on the north-east of the piazza relies heavily for self-expression on the structural system incorporating a reinforced-concrete Vierendeel frame. This permits column-free office space as large as 20 by 33 metres on alternate floors. The basement, ground floor, mezzanine and first floor are used by the bank itself. Its independent entry at one corner of the building is flanked by a sculptural overhang. The mezzanine peeps out into the double-height bank hall. This three-tiered volume is served by internal staircases. The subsequent floors, with separate entries, are fed through an external core containing vertical circulation and services. The block has an exposed ribbed and criss-crossed wooden pattern in poured concrete.

The residential block, along the south-west boundary of the piazza, contains shops on the ground floor and staff apartments on the subsequent floors. The configuration of this block provides the advantages of extended frontages, additional parking space and relief from the din and bustle of the busy road. The maximum depth of the block is limited to 8.3 metres throughout to facilitate cross-ventilation and allow in natural light. Suitable terraces are provided at appropriate locations in each flat. All this is a mixed construction of predominantly load-bearing brick walls and reinforced-concrete columns and slabs.




*Central Co-operative Bank Complex, Jalandhar* **211**

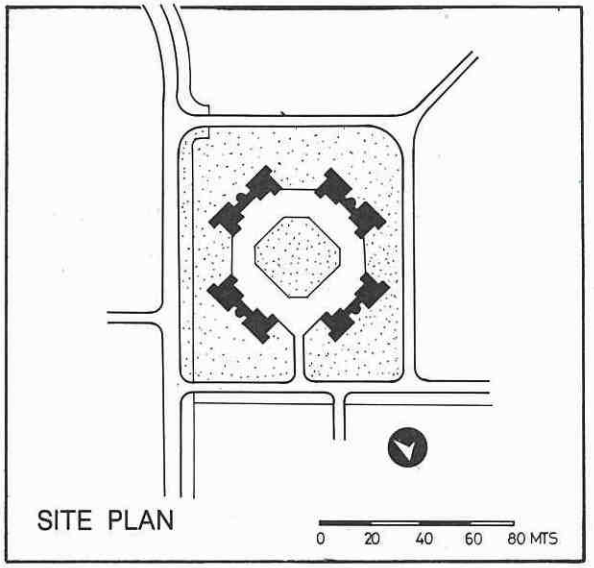
## OFFICERS' FLATS, PATIALA (1987-88)

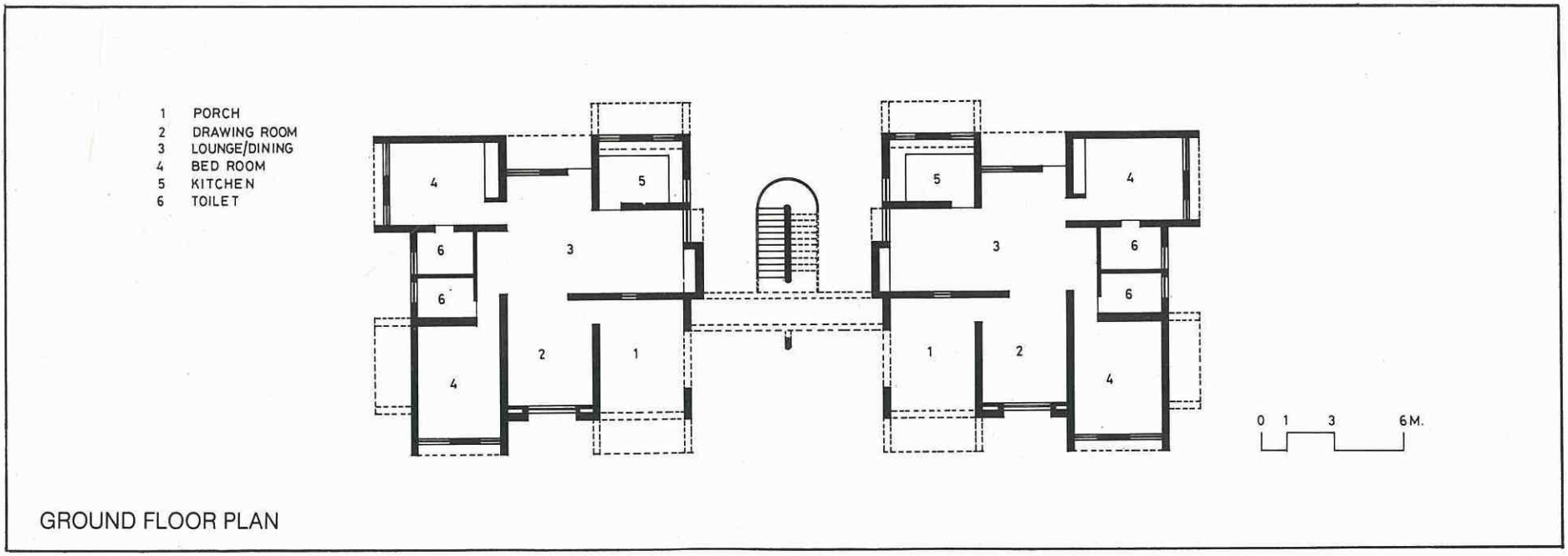
*Architects:* Ashok Dingankar and M.L. Ahuja, Patiala.

To provide provisional accommodation to its officers posted at Patiala, the Punjab State Electricity Board constructed 32 flats in the Shakti Vihar area of the city. Designing housing is a challenging task in Punjab where the weather conditions are extreme and, to make matters worse, there is no breeze when it is sorely required in summer and icy cold winds sweep the region continuously when even a draught is unwelcome in winter. Row housing and for that matter even terraced row housing has proved unsatisfactory in this climate. Cluster-housing with all four sides open is perhaps the only practical solution.

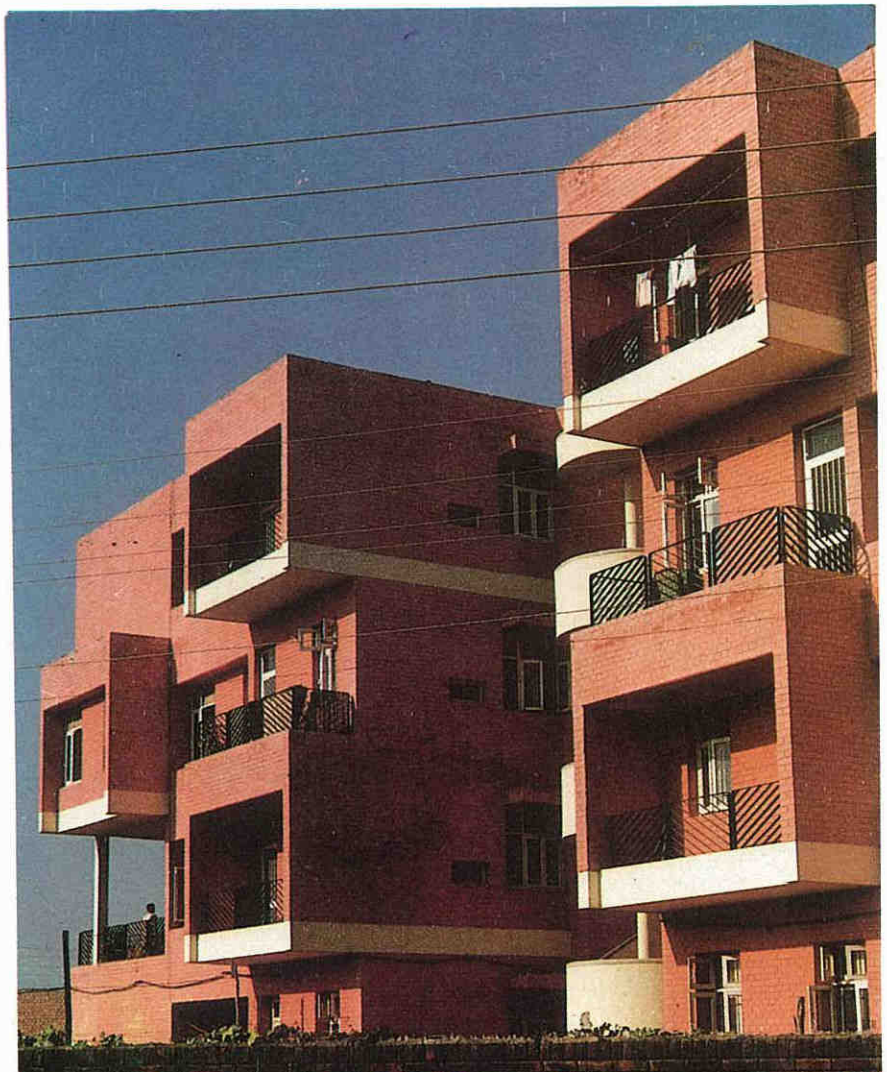
Keeping these factors in view, a cluster of four-storeyed flats was designed around a central community open space. It consists of a set of four blocks, each with eight flats. Each block contains on every floor two flats, 145 square metres each, with access from an independent staircase and a connecting bridge. A covered terrace at the corner of each flat with two sides open has been designed for outdoor sleeping in summer, for drying clothes, etc. Since all the four sides of each flat are open, there is plenty of daylight in each room and ample scope to let in breeze or shut out unwanted air currents.

To economise on services, the toilets and kitchens are vertically stacked. However, to achieve a sense of privacy and to provide variety in planning, the locations of covered terraces and bedrooms have been interchanged on different floors. The entire four-storeyed structure is in load-bearing brick masonry. The external walls have an exposed brickface with cement-based paint rendering to check moisture penetration through the walls.



Structure for privacy and dialogue



Stairs and Bridges: Interconnecting openness

Two-in-one: Balconies and shading

## NDDB STAFF HOUSING, NOIDA (1987-88)

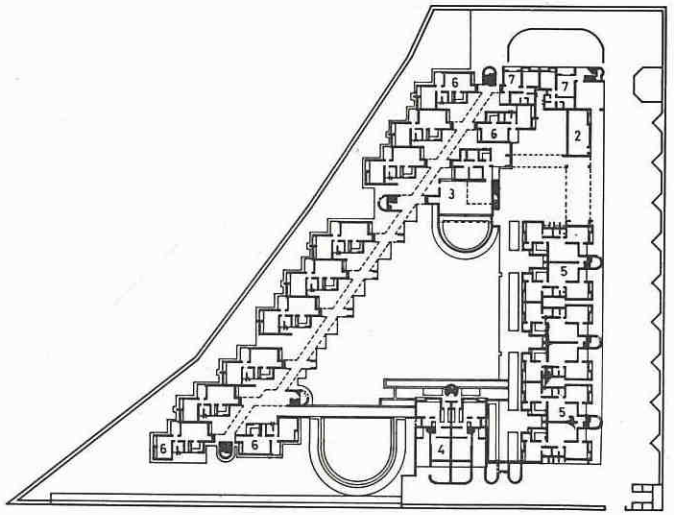
*Architect:* Ajoy Chowdhury, The Design Group, New Delhi.

A staff housing project consisting of 55 dwelling units on a 0.80-hectare site was implemented by the National Dairy Development Board (NDDB) at NOIDA near Delhi. The site, which is almost triangular, faces a storm water drain on the west, towards River Yamuna. Fortyfive more units are proposed to be constructed in the future.

The residential units are distributed along the boundaries of the site. All parking has been kept towards the north-east edge of the site, but is partially extended to serve the B-type units along the south-east side. The remaining land is mellifluously landscaped.

The dwelling units converge onto a central green, facing a club. Five types of houses have been designed for different categories of employees. The F-type units are the smallest and are located on the first level in the northern corner of the site. The B-type units adjoining the south-east boundary are the largest, each having an area of 157 square metres. These have been planned as duplex units and have a living-cum-dining room, a bedroom with an attached toilet and a kitchen on the ground floor and two bedrooms with attached toilets on the floor above. The C-type units flank the north-eastern side of the site. The D-type units with a 65-square-metre area each, have been designed in a staggered row along the western boundary of the site. A pedestrian walkway provides access to houses on the ground floor. On the upper levels, the walkway comes in the form of a bridge which is lower than the floor level of each apartment, thus ensuring a reasonable measure of privacy. The bridge extends all along the length of the site and is served by four staircases. The residential units proposed to be built towards the inner green space will also be connected to the bridge. The club, designed on two levels, is in the heart of the housing project and provides recreational facilities for the residents.

The structure is a combination of load-bearing brick walls and reinforced-concrete frame. Externally it has throughout an exposed aggregate finish consisting of white marble chips in grey cement. Horizontal grooves define the joints, while slate bands accentuate the slab level.




GROUND FLOOR PLAN

Functional linkage

Detailing details

Courtyard for community celebrations

## NEW MARKET REDEVELOPMENT PROJECT, CALCUTTA (1987-91)

*Architect:* Development Architects, Calcutta.

The New Market Redevelopment Project has come up on a 3.2-hectare site on Lindsay Street in Calcutta. The total built-up area of the project is 1,63,812 square metres.

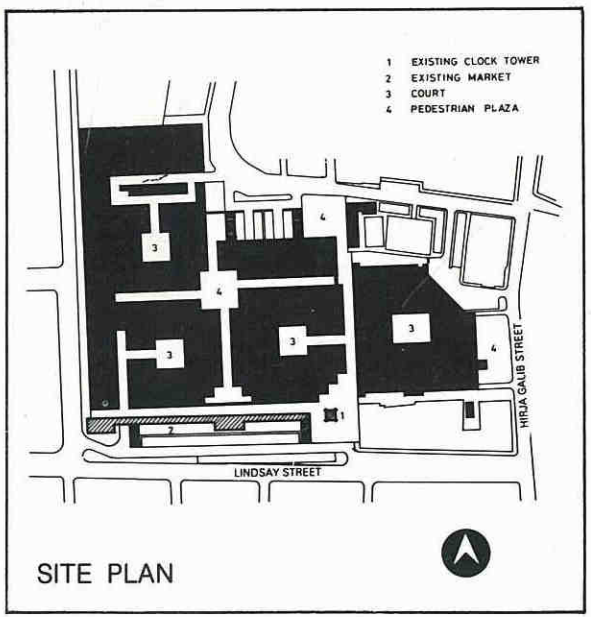
On the basis of the architects' recommendation, redevelopment is being carried out in three phases with temporary rehabilitation facilities, thus ensuring the regular operation of the market during the construction period.

The client's brief called for an overall redevelopment for the market and recommendations for improving the surrounding area. An attempt has been made to preserve both the architectural character of the surrounding area as well as the essential style of the existing New Market.

The ambience of the unique redeveloped market, with its glittering display of all kinds of merchandise and spacious aisles, has been enhanced by introducing internal courts, the scientific ranging of stores, wider alleys and two-tier underground parking.

For vertical circulation, escalators in the shopping area and lifts in the high-rise towers are provided, besides staircases.

The structure has a reinforced-concrete frame with pile foundations under the high-rise tower. Brick has been used for the walls. Kota stone, marble and terrazzo have been used for the flooring.



SITE PLAN

Concrete entry into brick centre


Method—even in commerce

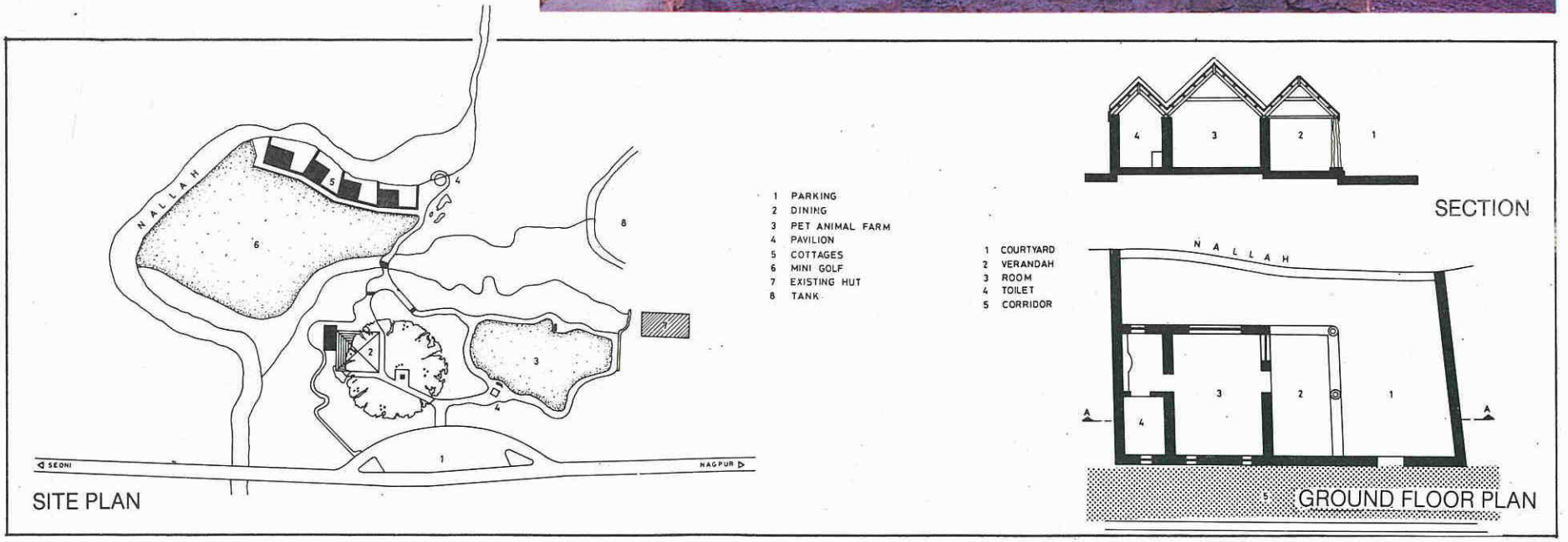
## REST HOUSE, SEONI (1987)

*Architect:* Sen Kapadia, Bombay.

The Rest House at Seoni on the Nagpur-Seoni road in Madhya Pradesh is built on a 1.2-hectare quiet wooded site. The total covered area is 278 square metres.

A modest programme of four rest rooms for touring government officials is reinterpreted here as a cluster of informal elements on the picturesque site. The undulating topography, the presence of a teak-forest, a small stream nearby and a large banyan tree were the prime factors taken into consideration while designing this project.

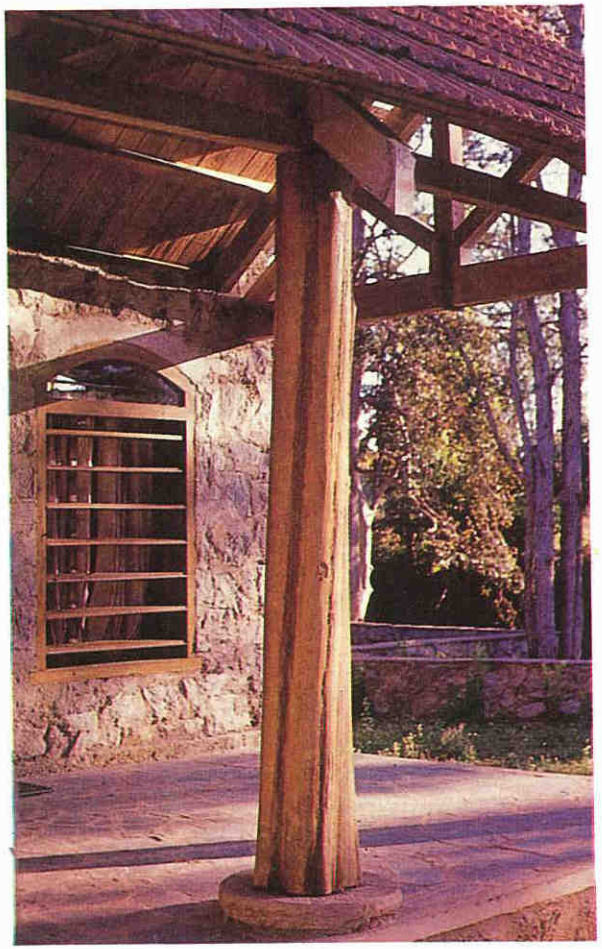
Each rest room is enlarged with an adjoining verandah and a courtyard. Four such units are allowed to ramble along the contours of the stream, without the assistance of a site plan. The project has been allowed to develop on the site without much detailing in order to impart a natural character and a great sense of economy to the construction.



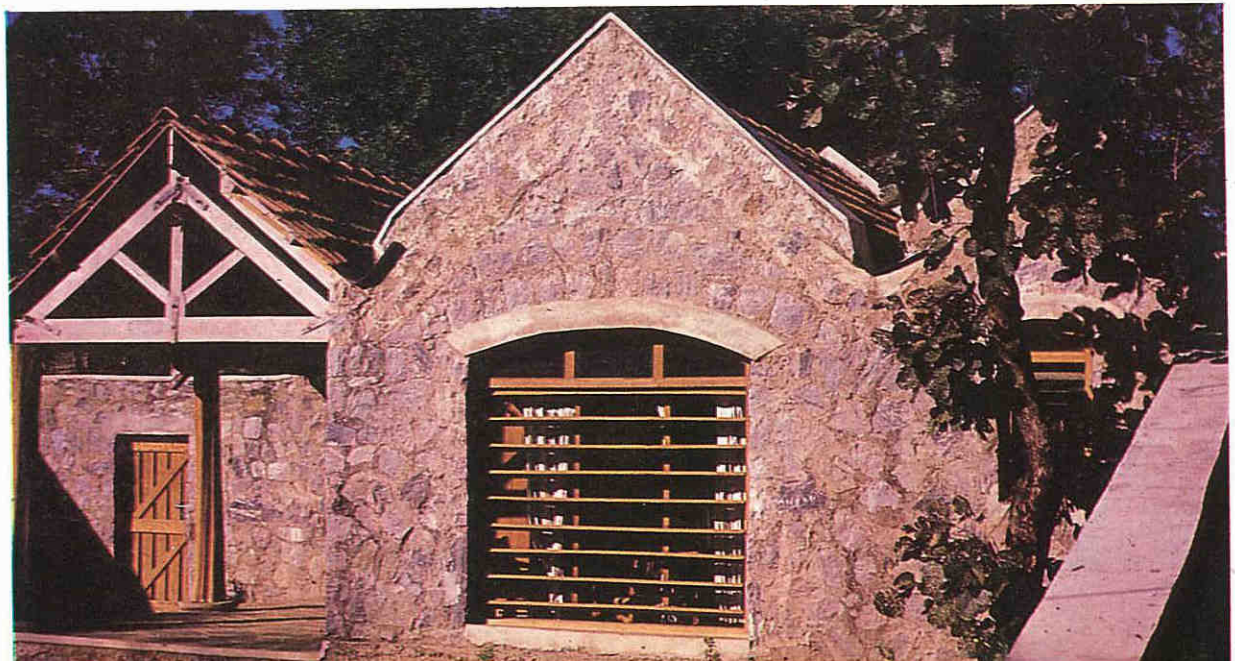
Local materials such as stone and teakwood are extensively used for construction. Each column is expressed as an unshaped teak trunk shaved of its bark. Wooden trusses, wooden louvered windows and stone walls provide the essential local flavour and generate unobtrusive aesthetics.

Timbre of timber: Tree as an artistic pillar of strength

The song of timber:
Tree as an architectural component



Architect's respect for the soil: Excitement of localisation



# BOOKWING PRINTING PRESS, DANTALI (1988)

*Architect:* A.V. Joshi, Ahmedabad.

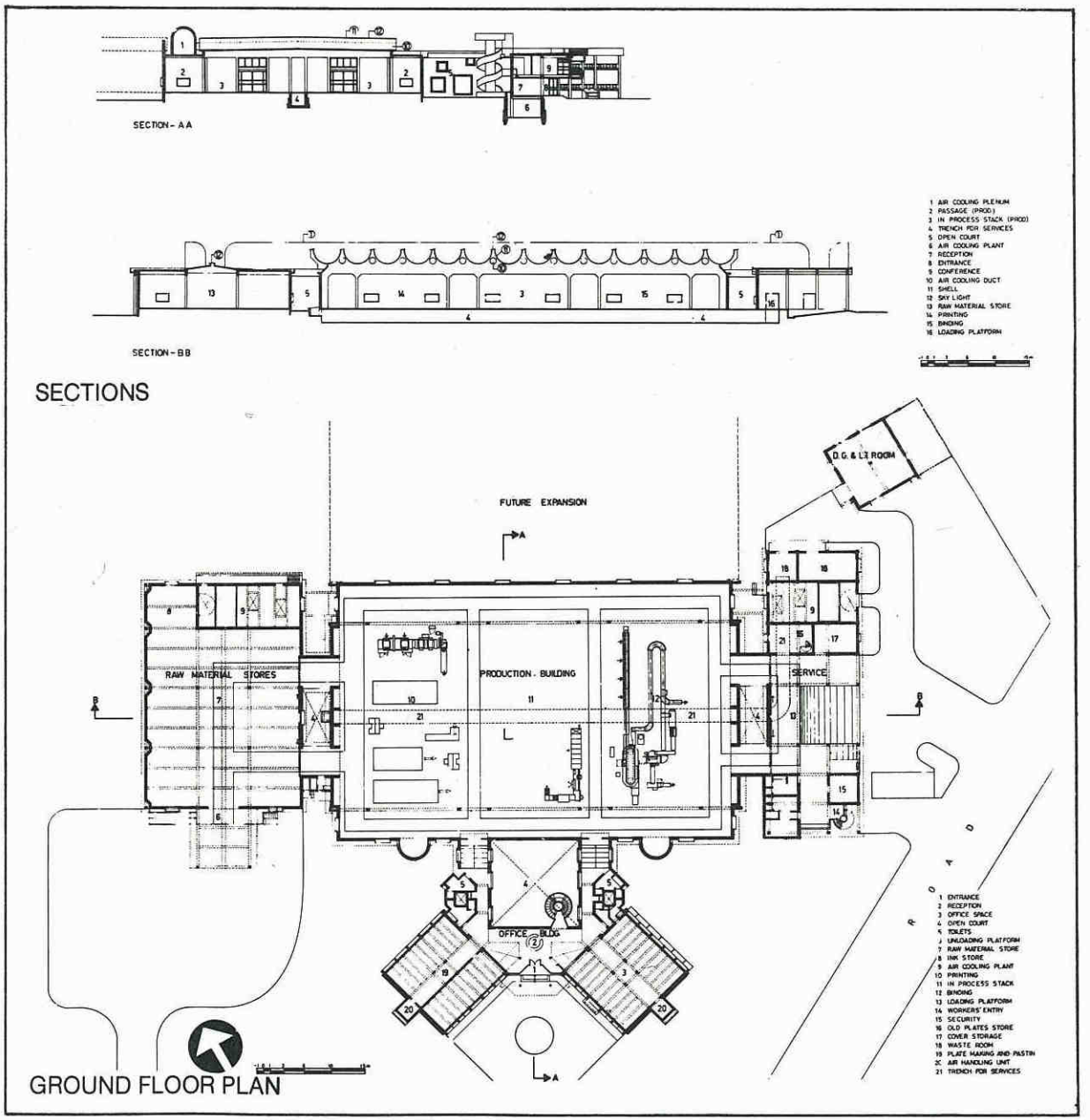
A modern printing press for Bookwing Publications was constructed on a 10-hectare site at Dantali village in Gandhinagar district of Gujarat.

The partially double-storeyed composite structure, having an area of 6,161 square metres, consists of four wings.

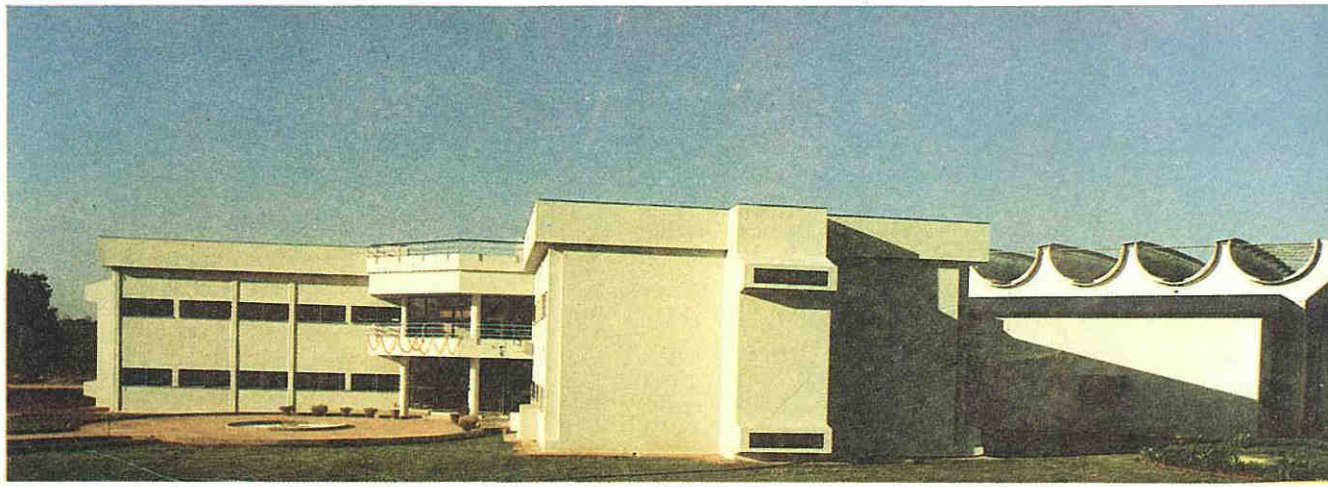
The production wing which houses the printing and binding section is located in the centre. The raw material godown is situated north-west of the production wing and the ancilliary block on its south-east side. The administrative block on the south-west side has an open-to-sky court which acts as a unifying element between the administrative block and the production wing.

The plan has been evolved strictly on the basis of a well worked-out flow diagram to achieve total functional efficiency with minimum movement of men and materials. To facilitate transportation of goods by forklifts, two links of four metres width each are provided on either side of the production wing, connecting it with the raw material godown and the ancilliary block.

Innovation in the roof structure of the production wing is the hallmark of the complex. To achieve the 28-metre span needed to accommodate an automatic binding machine and to meet the requirement of air-cooled space, a roof section with a tubular steel structure in the form of semi-circular shells was adopted. The shells have corrugated curved aluminium sheeting above and plain aluminium sheet cladding below and are so placed as to accommodate linear skylights in between. Suspended air-cooling ducts run along these shells underneath the skylights. Fabricated from aluminium framing and sheeting, these circular ducts also support tubelight fixtures.

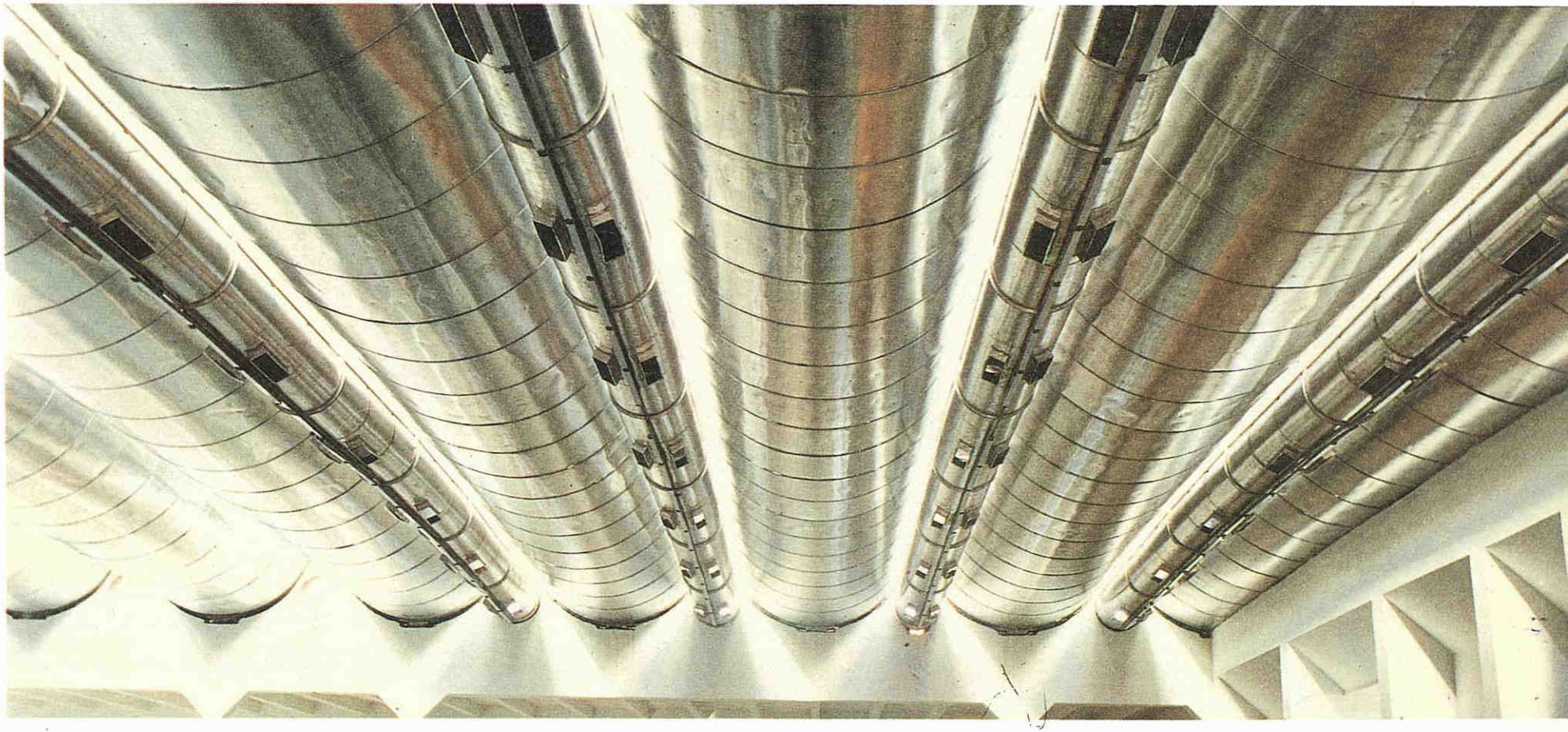


This system of roofing helped in achieving clear uncluttered space, a drastic reduction in air-cooled volume, an even distribution of natural as well as artificial light, heat insulation because of the cavity created by double sheeting, enormous saving in construction time and economy in the use of structural steel.



Tunnelling the wide span

Hand in glove: Cooling ducts and aluminium ceiling



## INDIAN INSTITUTE OF FOREST MANAGEMENT, BHOPAL (1988)

*Architect:* Anant Raje, Ahmedabad, Associate Architects. Amita Raje and Gautam Bhatia.

The Indian Institute of Forest Management at Bhopal has a 17,500 square metre built-up area on a 65-hectare hilly site. The design of the institute was inspired by the perception of continuity which mitigates isolationist tendencies and the belief that institutions are self-contained entities whose growth is nurtured by a process of self-renewal through the various stages of their development. The plan attempts to create a sense of community without contradicting the students' need to feel independent.

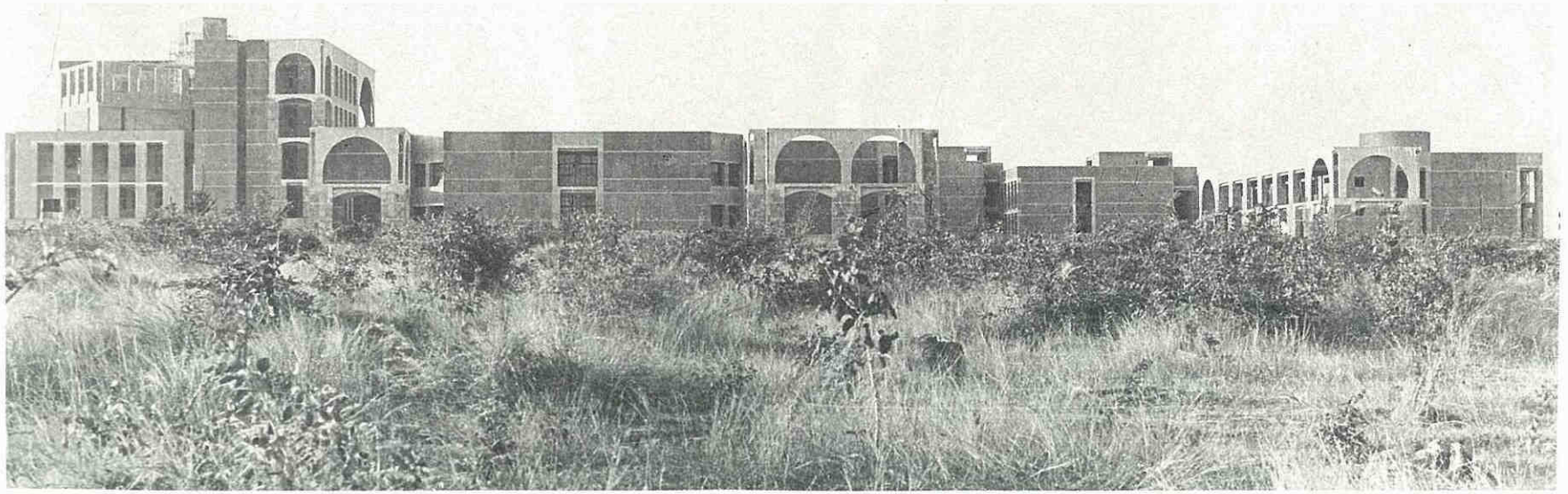
The hilly site is crowned by the academic complex and is marked by the presence of a compact, cohesive group of buildings which constitute the working zone. The area flows along flat contours, providing a linear form capable of extensions along the side of a promenade. The academic complex has a court surrounded by classrooms, a library, an auditorium and seminar rooms. The library building, being four-storeyed, serves as the focal point of the academic court. An amphitheatre, with a seating capacity of 750, is planned for multipurpose activities.

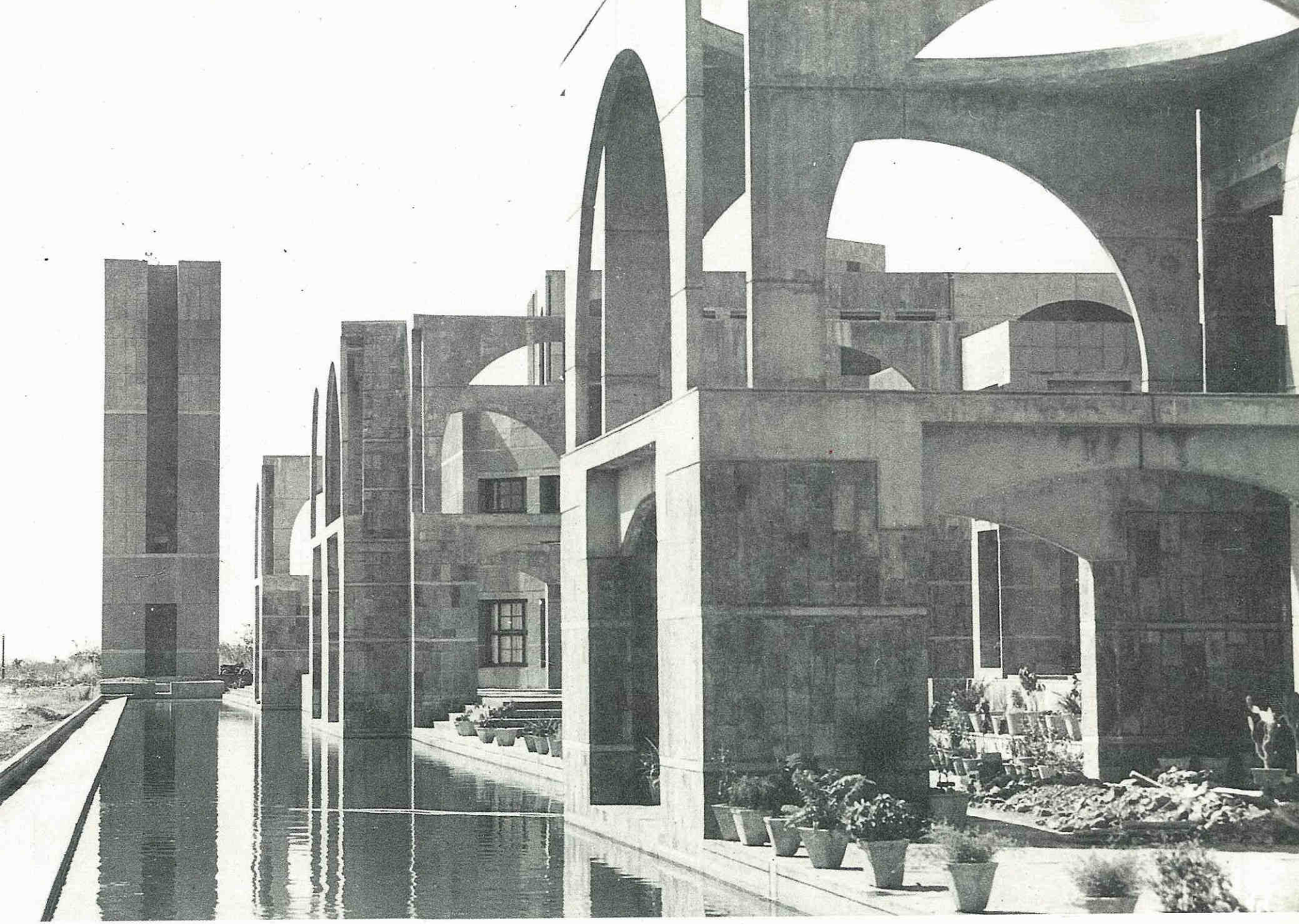
The living zone consists of students' dormitories, a kitchen, dining areas and spaces for group meetings. The students' dormitories are located on the southern tip of the academic complex. All dormitories face the lakes on the southern slopes and are in close proximity to the library in the academic complex. The openings are recessed into shadow pockets which become the dominant architectural feature, controlling and directing scale and proportion throughout the complex.

Rows of trees between the dormitories and the academic complex create a buffer zone, besides providing shaded walkways connecting the groups of dormitories. The main features of the site are two hillocks with outcrops of slate stone. As a counterpoint to the natural features, deep bands of trees selected from the types found on the hill are, when fully grown, expected to shade the walkways and certain areas of the courts. There are water bodies all over the site. Water is carried in narrow channels to the green areas. A water reservoir on top of one of the hillocks gives a sharp focus to the landscape.

The entire campus is constructed of brick masonry for walls. Reinforced concrete is used for the internal frame structure. Lintels are standardised and are left with exposed concrete surfaces. The areas around the opening are clad in rough Kota stone and slate of bluish-green to purple hues. The remaining part of the exterior masonry wall surfaces is plastered with stone-washed grit. Coarse stone-masonry retaining walls are used for creating terraces and steps on various levels in the courts.

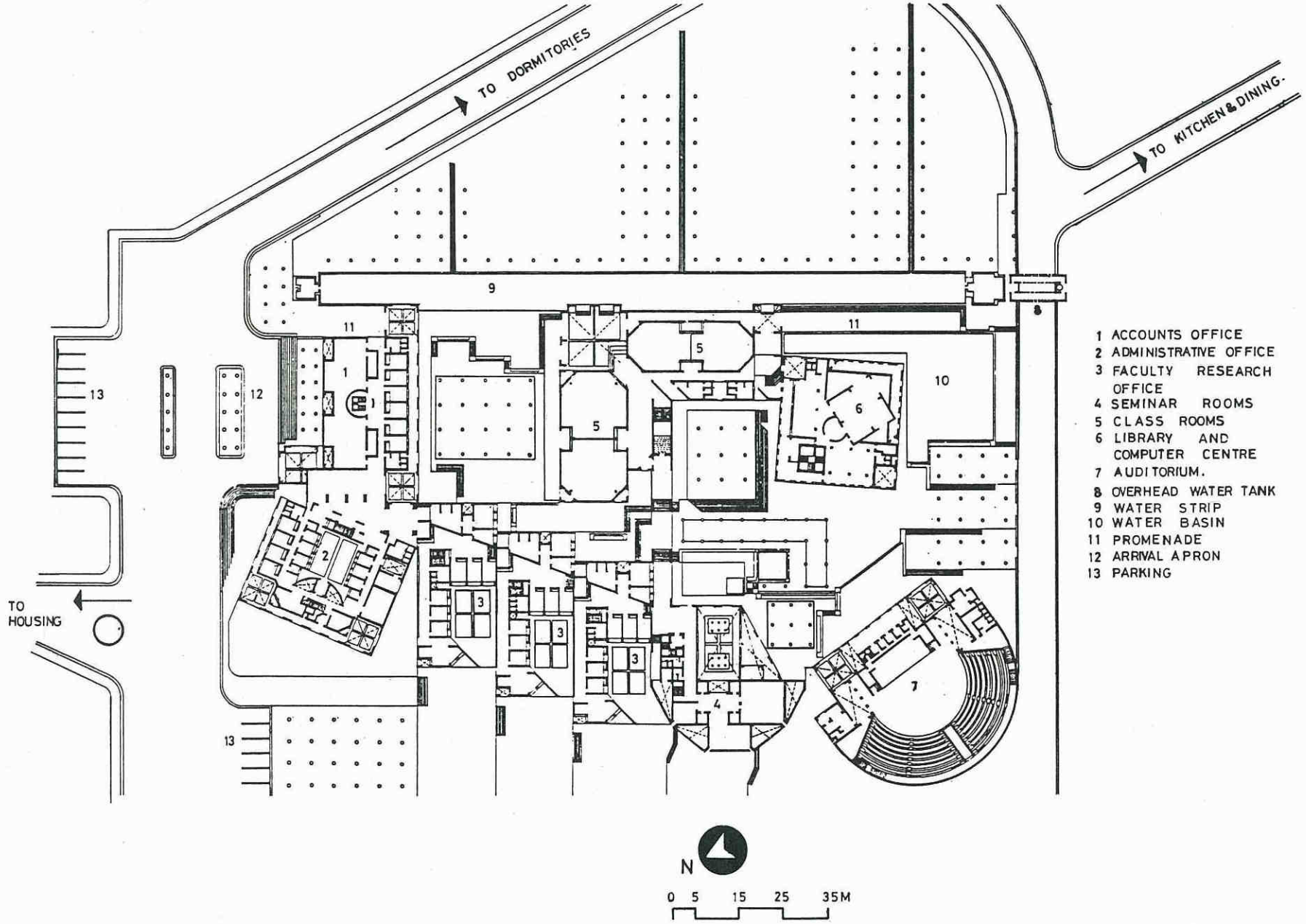
Opening to breezy whiffs





Enter for prominade and water

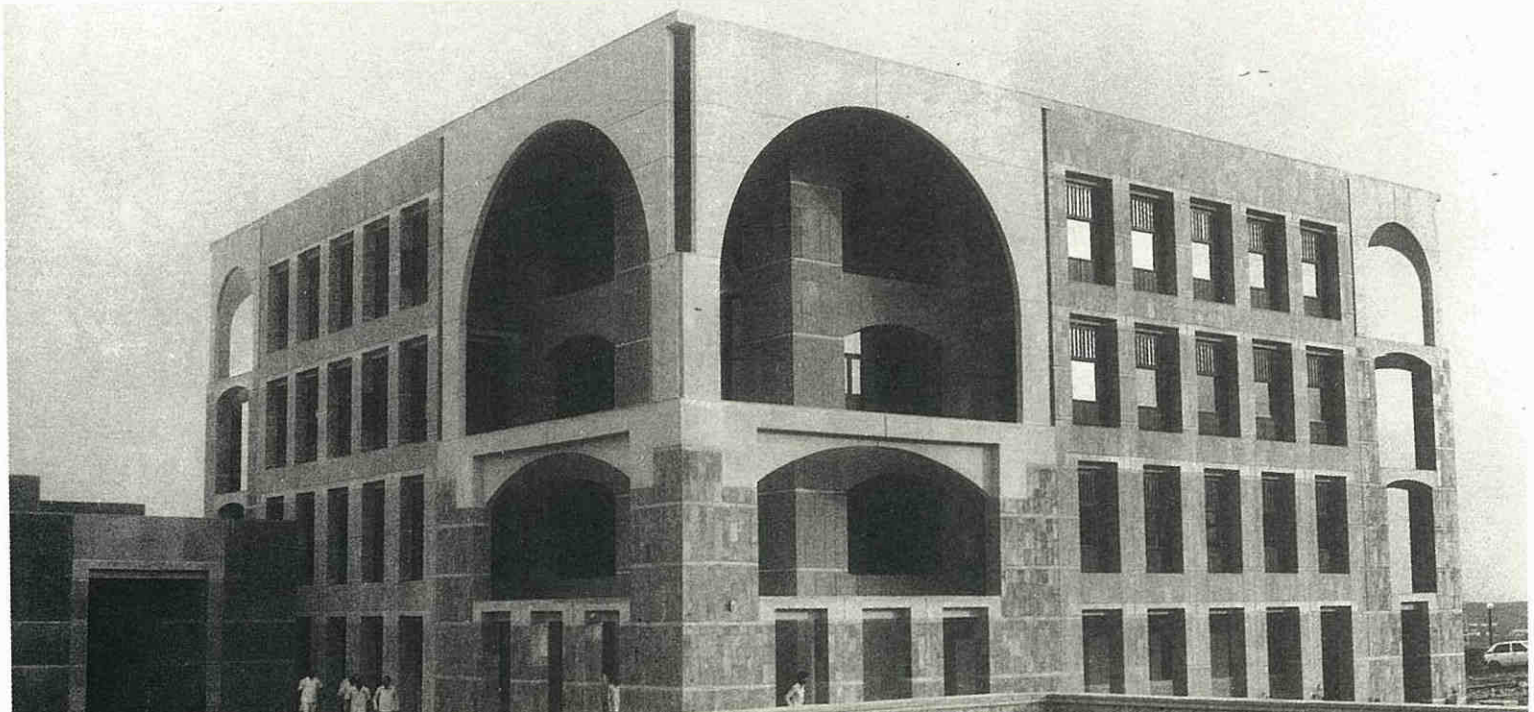
ACADEMIC COMPLEX




PLAN

Making for classrooms

Searching library treasures



## NEW HOWRAH STATION AND RAIL YATRI NIWAS, CALCUTTA (1988-1990)

*Architect:* Development Architects, Calcutta.

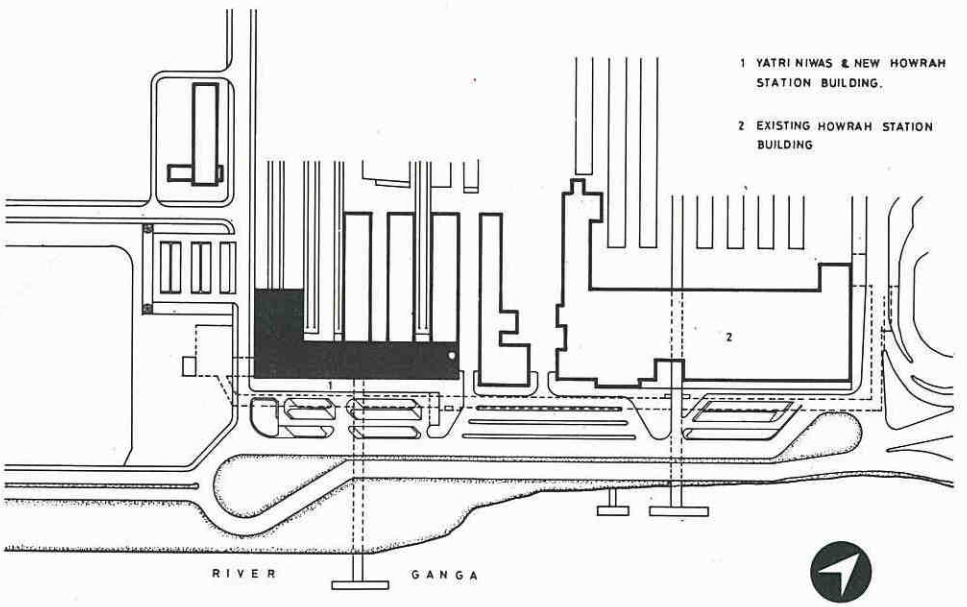
Howrah railway station, operational since 1884, is the second largest railhead-cum-terminal in India and the nodal point of eastern India's travel, trade and commerce. The existing facilities have for long proved inadequate to handle the rapidly increasing passenger volume, traffic intensity and the required extension of ancillary services.

Calcutta, having been for long the Capital of British India, is characterised by some of the finest specimens of colonial architecture. The architectural style being integral to the city's ethos, its continuity is expected in the present-day buildings.

In designing the Yatri Niwas (travellers' rest house) and the new terminal, both which are part of the same complex, the architects have sought to blend the central architectural theme of the adjacent station building with contemporary motifs and the latest building technology. The new complex with 6,660 square metres of built-up area, lends an added grandeur to the river front on which it stands.

The design brief called for a four-pronged strategy that involved the development of Yatri Niwas, a new terminal building and more platforms; modernisation of the existing station; provision for an interconnection between the new Hooghly Bridge, improvement of traffic, transportation and parking facilities and the bus terminus, etc. at the station and the interconnecting ferry services; and reduction of the existing and new traffic load by shifting some of the South-Eastern Railway passenger trains to the coaching terminal at Shalimar and Eastern Railway goods trains to Dankuni.

The reinforced-concrete-frame structure of the building rests on piles. Brick walls are clad with Agra stone on the external sides. Marble, terrazzo, Kota stone and unglazed ceramic tiles have been used for the flooring.




SITE PLAN

Out of Railway Station into Yatri Niwas, in same the style

## CIDCO PUBLIC HOUSING, NEW BOMBAY (1988-1991)

*Architect:* Uttam C. Jain, Bombay.

The CIDCO Public housing "townscape" project is built on a 7.6-hectare site, 50 km away from Bombay on the Bombay-Pune road, near Panvel. The complex provides for 927 dwelling units of varying sizes.

The present scene in New Bombay is a combination of two extremes—on the one hand continuous concrete-slab construction whose urban character has been contaminated by the ugliness and monotony of mass housing; and on the other a stage-managed rural proclivity for single- or double-storeyed housing which is, essentially, an indulgence in romanticism. However, the architect in the CIDCO project has struck an independent path between the two extremes and thus is quasi-rural and quasi-urban in his approach.

In conceptualising this housing scheme, the issues addressed are broadly two-fold: first, creating appropriate urban form and cityscape; and two, producing the potential for a qualitatively significant life for the inhabitants at convenient costs.

The pyramidical hierarchy of plots for each dwelling, opening onto a central square and flowing further into a large quadrangle, eventually leading to open fields and play-grounds of the neighbourhood scale, all permeate the development conceptualisation, creating a fresh weave of urban fabric. The entire built-form becomes pervious in response to the hot and humid climate of the region.

An intricate web of pathways, providing the shortest possible routes in all directions, is laid. Vehicular traffic is restricted to the periphery. The *cul-de-sac,* however, penetrates deep into the inner core at strategic points, facilitating vehicular approach and within a reasonable walking distance from each dwelling.


LAYOUT PLAN

All common facilities are located near the geographical centre of the complex. This puts them within easy reach of all inhabitants.

The dwelling units with a lesser built-up area are located on the ground level, thus giving them full advantage of the open spaces on the side. The dwellings with a higher floor area are, when not at the ground level, compensated by terraces at different levels. This indeed augments the usable space, creating better livable environs.

The rise of the residential buildings is limited to three upper floors. Vertical stacking of wet areas such as toilets offers some measure of economy. Another fallout from such layering of four floors is the optimal use of common staircases, resulting in further cost reductions.

Creating patterns in Nature's lap

Housing Model

## YOUTH HOSTEL, ROPAR (1988-91)

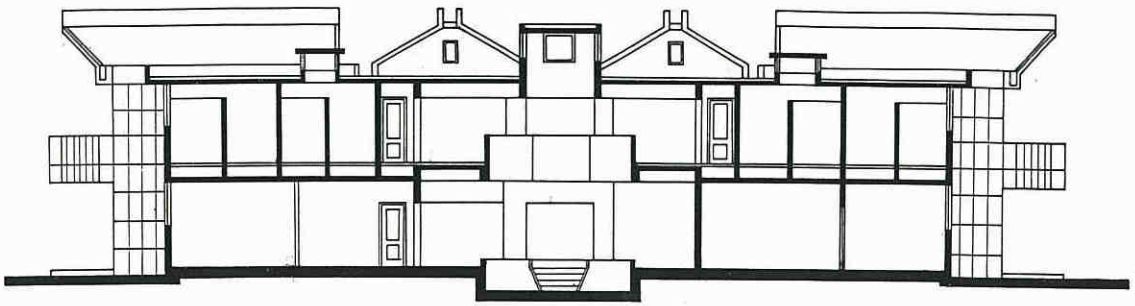
*Architect:* Saakaar Foundation, Chandigarh.

The Youth Hostel building on a one-hectare plot in Ropar in Punjab has been constructed on the national highway near Nehru Stadium. The undulating site has been filled with loose soil and gravel. The hostel purports to provide inexpensive accommodation to young persons out on educational tours, excursions and visits to historical and cultural centres. The form of the building has been designed to complement the exuberant energy of youth.

The double-storeyed building, with 1,100 square metres of floor area, is a compact, cross-shaped structure with sloping and projecting roofscape. It contains a reception hall, an office, a lounge, a multipurpose hall, a luggage room, a reading hall, a dining hall and a kitchen, besides a residence for the warden and storage space, on the ground floor. The first floor accommodates six dormitories and two leaders' rooms with attached toilets.

All the rooms are accessible through a star-shaped internal circulation core, which has two staircases and nooks for interaction. A double-height lounge with sunken seating on the ground level and a skylight on top not only gives a feeling of spaciousness but also links the two levels visually. The skylight is designed to act as a ventilator as well as a source of natural illumination. For achieving a comfortable indoor environment, sufficient cross-ventilation has been ensured and the windows are well protected by roof overhangs or projections. Planned on rigid geometry, the building has a slanting roof coupled with rain water spouts on the four corners. Underneath these spouts, stone masonry pits are provided to receive the rain water.

The reinforced-concrete-frame structure has in-fill walls of brick. The external surfaces are finished in grit and the interiors are plastered.



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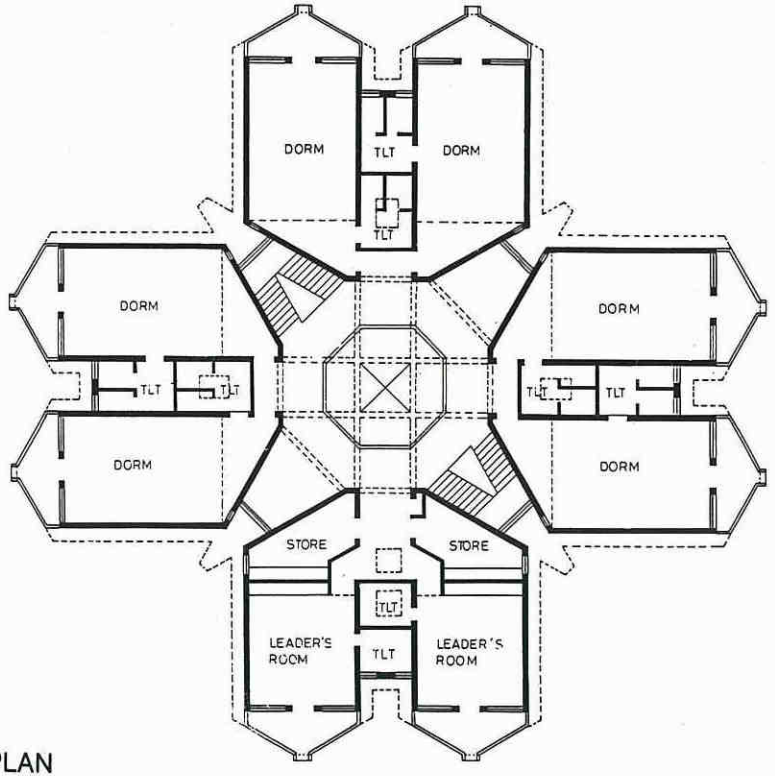



FIRST FLOOR PLAN

Exploiting Pythagorian geometry

## BHARATIYAM GRAM, NEW DELHI (1989)

*Architect:* Laul & Associates, New Delhi.

Bharatiyam Gram is located on a 5.26-hectare moderately wooded site, featuring little known historical monuments and a swimming pool, in East Nizamuddin near Hamayun's Tomb in Delhi.

This low-cost project was built to accommodate 7,000 school children brought to Delhi from all over India to participate in the Jawaharlal Nehru Birth Centenary Celebrations. The occasion was meant to commemorate Children's Day and also Nehru's love for the little ones. The design constraints were that all the existing trees were to be retained and no construction was to be proposed within 12 metres of the existing ruins. Besides, the time and cost factors had to be kept in mind.

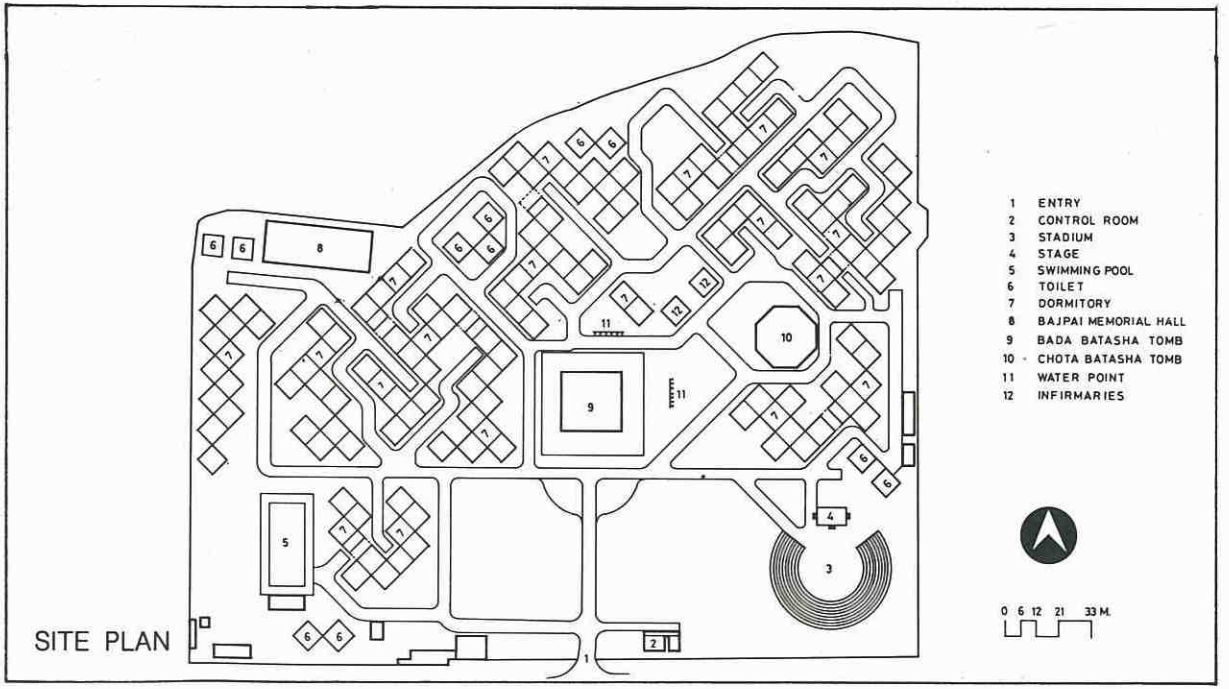
An attempt has been made to maintain a village-like atmosphere amid lush vegetation. The 155 housing units are locked end-on-end in a part-serrated and part-linear profile. They form simple yet interesting streets, punctuated by open courtyards. The units are roofed by geodesic modules which are light, easy to install, time-saving and easy to dismantle.

The individual unit is a square, each side of which is 7.9 metres, with reinforced-concrete posts at the four corners supporting a steel geodesic dome, low-rise and wide spread. The triangular in-fills of the steel skeleton are of medium-density fibreboard, which has good insulation value and can be rapidly cut and screwed into place.

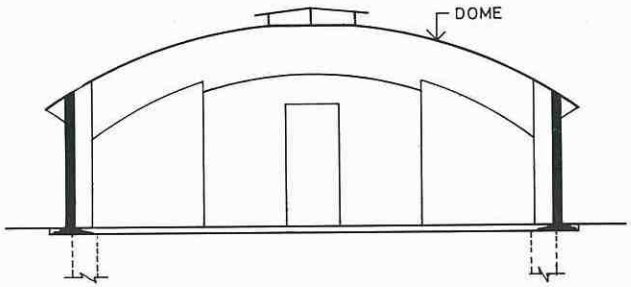
The roof is finished with cross-lapped plastic shingles to make it waterproof. At the apex is a pyramidical skylight-cum-ventilator. The walls are an interesting combination of bricks, hand-moulded concrete and rice-husk blocks. The walls are independent of the columns and ceiling, resting on funicular shell foundations.

The windows are replaced by *jaalis* or lattice-work, thus assuring good cross-ventilation and security while reducing costs. The architect's idea of enlivening the walls with paintings, mirrorwork and mud coats not only helped in generating employment for local artisans but also established identification by personalising the modules.

Lesson in grass roots for children




SITE PLAN

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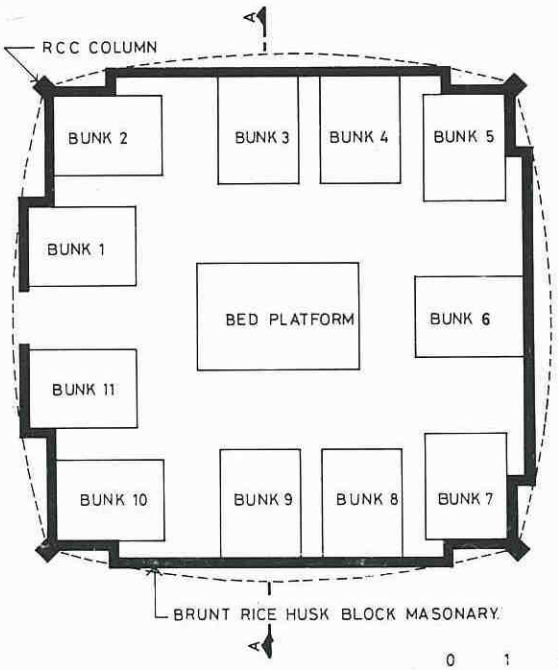
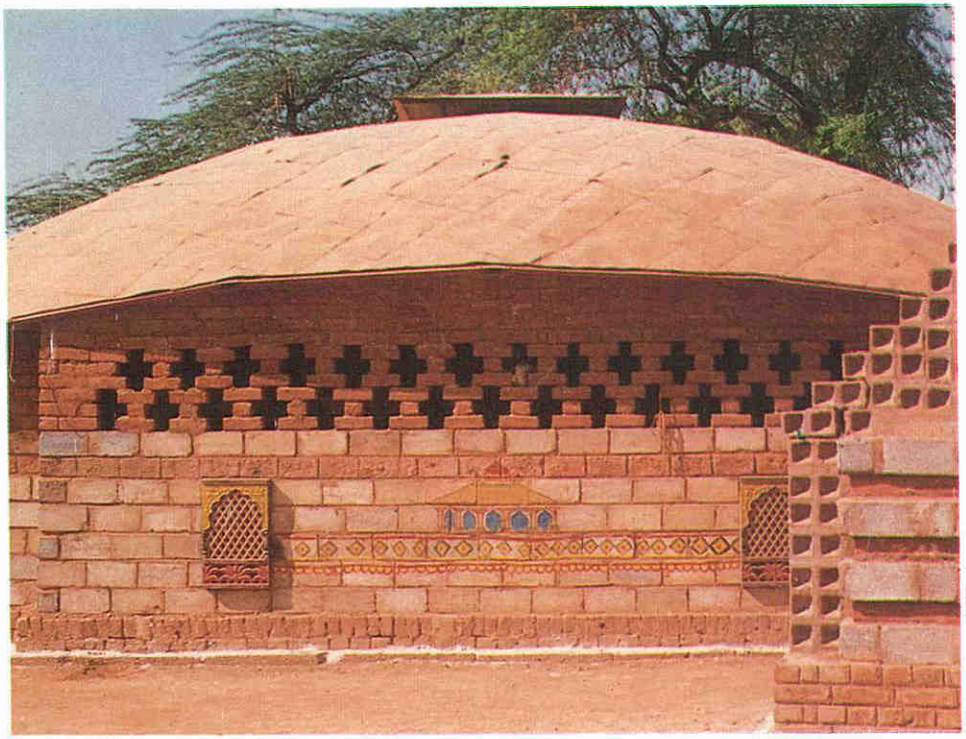
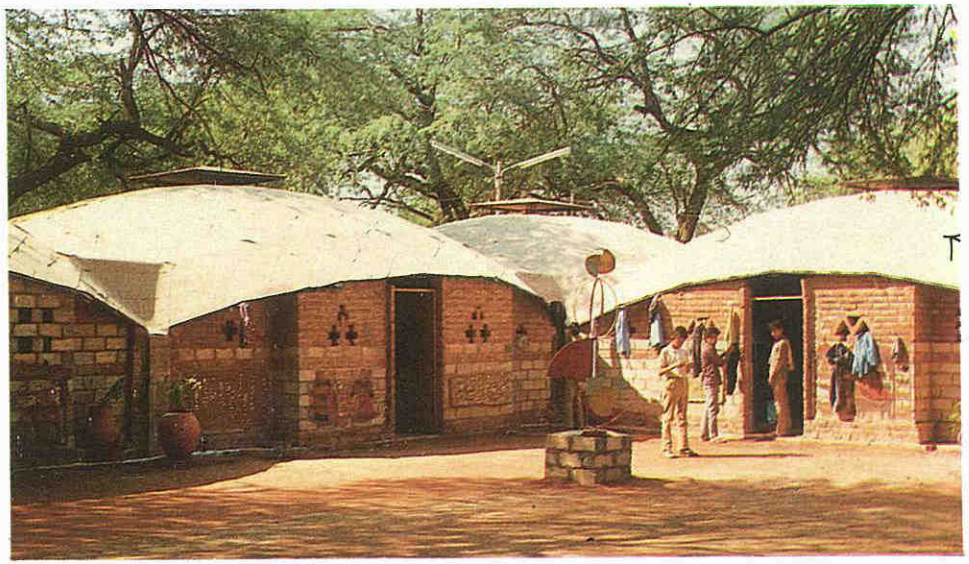



PLAN



Folksy walls

Playful architecture



## JAWAHAR BHAWAN, NEW DELHI (1989)

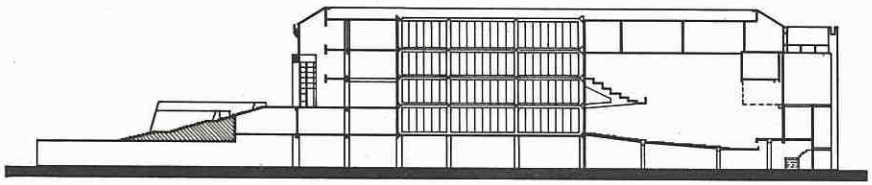
*Architect:* Raja Aederi Consultants Private Limited, Bombay.

Named after India's first Prime Minister, Jawaharlal Nehru, Jawahar Bhavan in Delhi has been built to serve as a research institution that could delve into the role of the Indian National Congress in the freedom movement and the development of the nation. The main entrance to the building is from Dr. Rajendra Prasad Road with a subsidiary entrance and exit on Jantar Mantar Road. The total built-up area of this building is approximately 11,150 square metres.

The main entrance incorporates a vast gathering space for open-air meetings, utilising the physical aspect of the site. The architectural elements used in the building are derived from Lutyens's buildings nearby so as to harmonise it with the existing built-environment.

The building is planned around a triangular landscaped courtyard which is used for informal gatherings. The external walls have cavities for insulation and niches to display the thoughts of eminent leaders. In the interiors, the walls are designed to serve as exhibition panels, lit by a skylight above.

The basic construction materials used are concrete, brick and steel. The external surfaces are either plastered or clad with sandstone.



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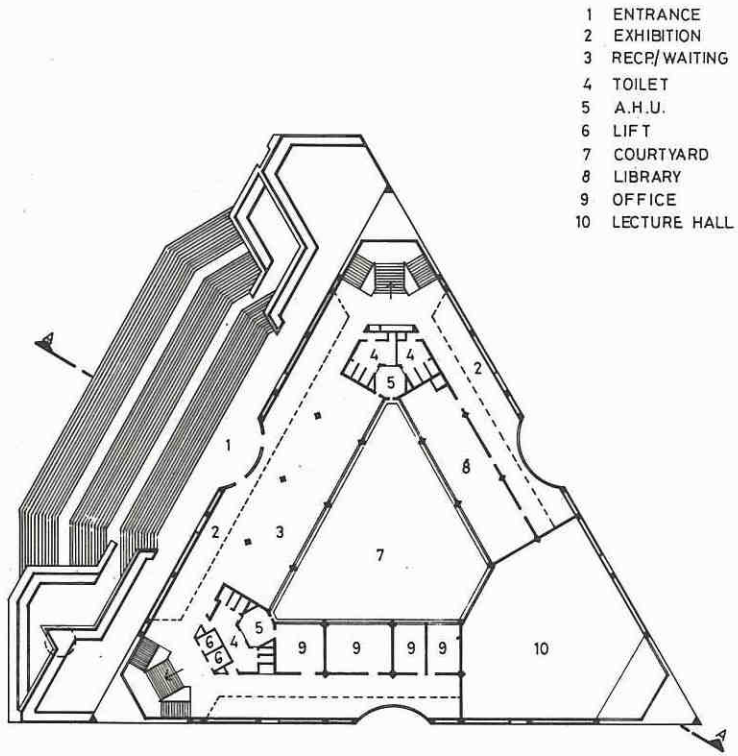
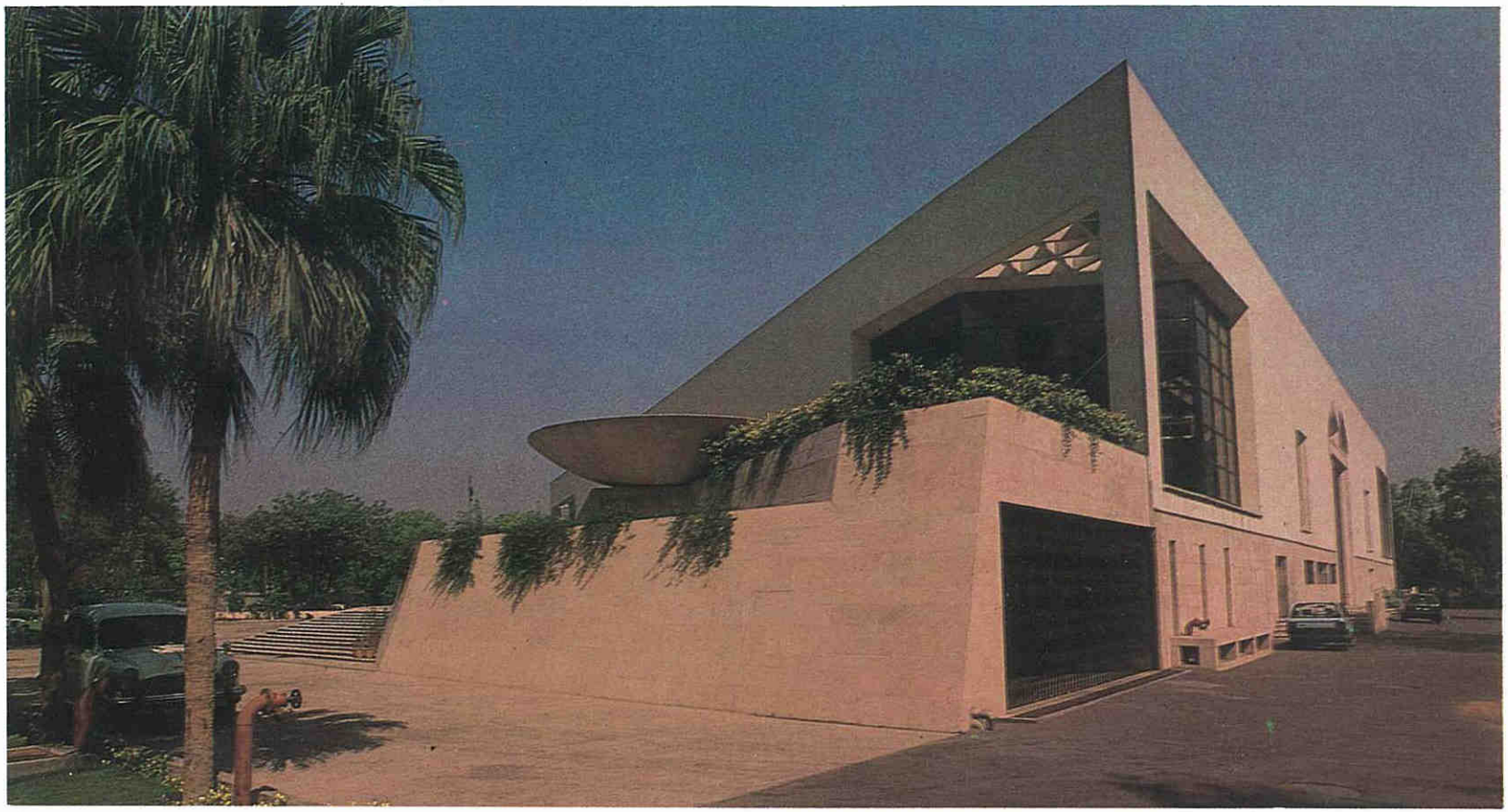



FIRST FLOOR PLAN



Designing political categories amidst triangle of architecture

Structure for politics

## FALCONS CREST, BOMBAY (1989)

*Architect:* T. Khareghat and Associates, Bombay.

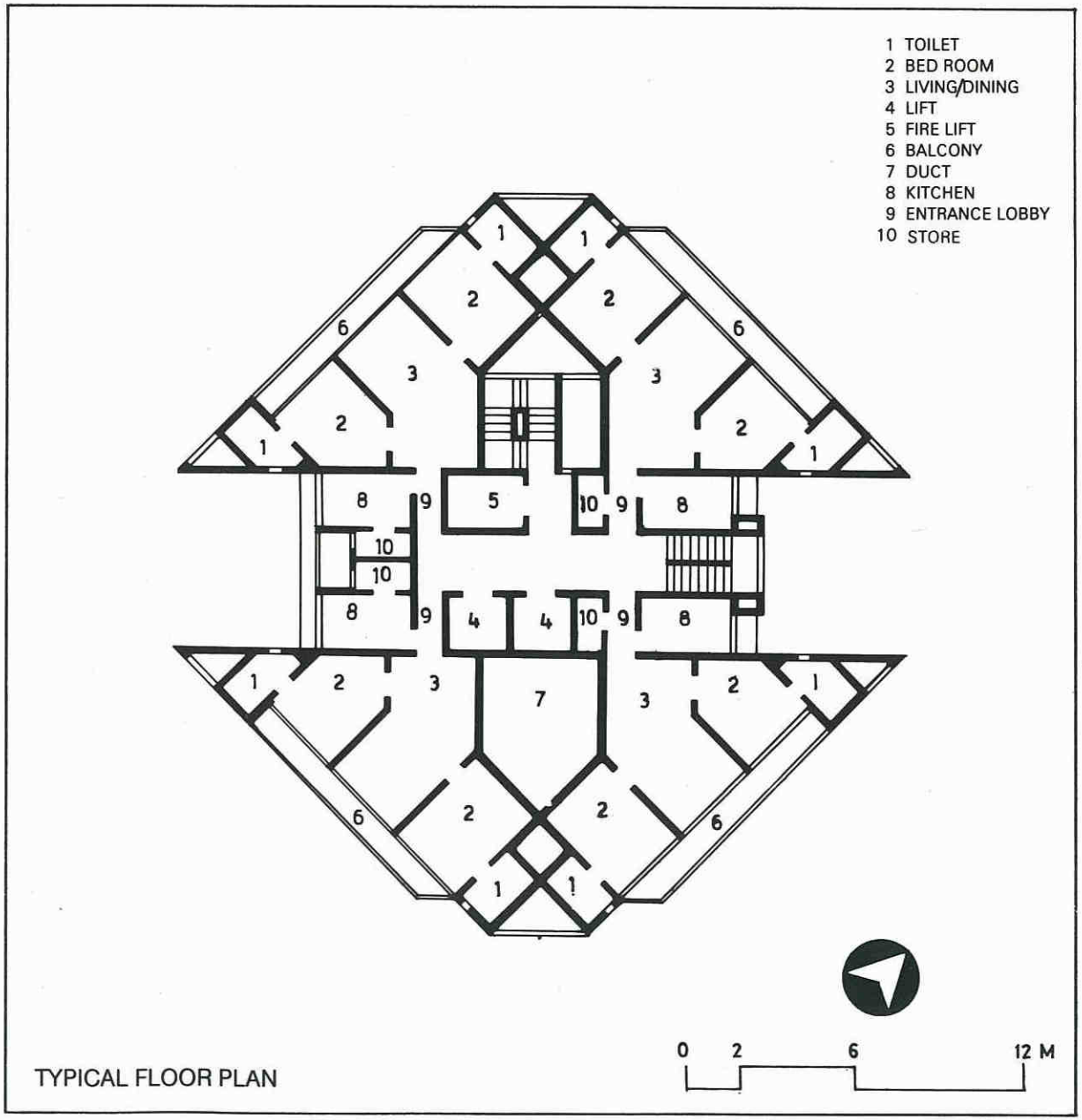
Falcons Crest is a high-rise housing tower, with a total covered area of 12,555 square metres, in Parel, a plush suburb of South Bombay.

The concept is based on economical planning by sacrificing any area not absolutely necessary, like large landings, wide staircases and long common corridors thus improving the efficiency of the available space. In order to give a feeling of spaciousness in the rooms, wall-to-wall windows have been introduced.

The 82-metre-high tower has 24 storeys above the podium level, in addition to covered parking on the ground floor. It comprises 96 dwelling units with four units on each floor, arranged in a configuration of two triangles on both sides of a rectangular service core. Each dwelling unit has an area of 90 square metres and contains a living-cum-dining room, a kitchen, a store and two bedrooms with attached toilets. The toilets are tucked away at the corners of the plan. They taper into angular ducts with large cutouts in the walls.

The structure system has beams above 2.10 metres from the finished floor level, eliminating the need for lintels above the doors and windows as well as any protrusion that might occur in positioning the beams in reinforced concrete. Thus the beams travel in a neat box-like frame along the four sides of the room, fitting in above the doors and windows in clean straight lines.

This large beam depth has two advantages: first, it eliminates the need for brickwork to fill in the gap between the concrete lintels and overlying slab, thus reducing the risk of cracks due to change in materials; second, the quantity of steel required is reduced, substituting it for comparatively cheaper concrete.




TYPICAL FLOOR PLAN

Floating columns were rejected because they increase dead loads and, consequently, restrict the typical plan, tolerating no changes in the positioning of rooms. Instead, sheer walls are introduced in the direction of lateral loads.

Bay of windows for a wider view

## TITAN WATCHES COMPLEX, BANGALORE (1989)

*Architect*: Chandavarkar & Thacker, Bangalore.

The Titan Watches industrial complex is situated on a 6-hectare site stretching across a steep slope. The gradient of the site was a great challenge in planning, especially since large manufacturing areas were required on a uniform level.

The complex comprises an administrative block, manufacturing and assembly units, a case project, a works entry complex, a plating and heat treatment plant and a service block, besides a canteen, main store and overhead water reservoir.

The main entry to the factory complex is at the highest level from the approach road on the west of the site. The works entry complex, comprising locker-rooms, a creche, security, time offices, a first-aid post and workers' and material entry points, is sited off the approach road. The canteen, main store and services building are located centrally, while the manufacturing shop is located north of the service zone to utilise the only levelled area of the site.

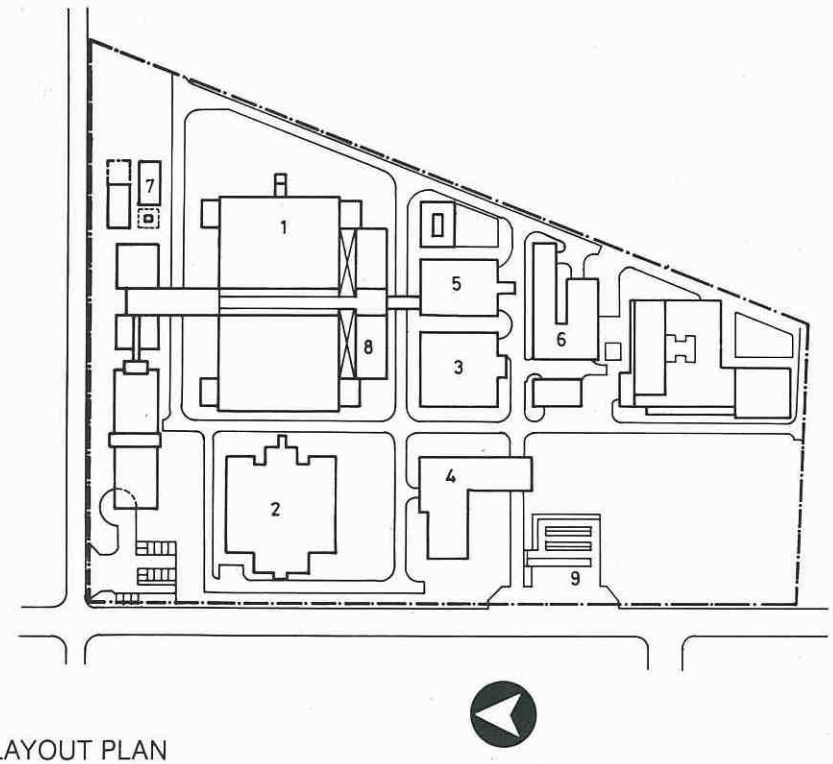
The manufacturing shop's main service corridor runs north-south, feeding the individual shops planned on either side and also connecting the main store and plant. Taking advantage of the site, the assembly building is planned on two levels—the materials movement area and the main assembly shop on the upper level and workers' entry and lockers on the lower. A mezzanine level above the workers' entry point is planned as a visitors' gallery from where one could look down into the main assembly shop.

The administrative building is located on the north-west corner of the site to allow a separate entrance.

Service lines like cable trays, mechanical piping and airconditioning ducts run overhead all along the periphery of each of the manufacturing shops in a three-tier design to facilitate easy access for maintenance and so that these are not prominently visible from the shop floor.

The basic concept of landscaping is a free-form garden, without regular flower beds. Since the rocky terrain does not have deep layers of top-soil, holes were drilled into the rocks and filled with soil. Ficus trees have been planted in these holes as their roots emit an acid which eats into the rocks as they penetrate deeper.

A reinforced-concrete-frame structure is used for the production and storage buildings. The roofs are a combination of corrugated aluminium sheets over mild steel trusses for large spans and reinforced-concrete slabs for the smaller ones. Aluminium glazed windows and plastered walls constitute the horizontal outlines of the exterior and emphasise the plant's contrast with the sloping terrain of the site.

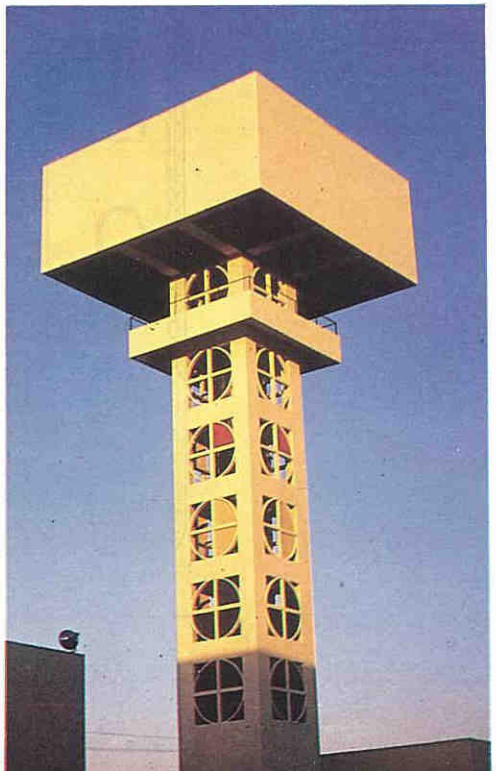



LAYOUT PLAN

Administrators keeping watch on times of activities

Assembling parts to a natural finish

Bridges of understanding with technical office



Sense of times: Water tank

## CHURCH OF GOD (FULL GOSPEL), CHANDIGARH (1989-90)

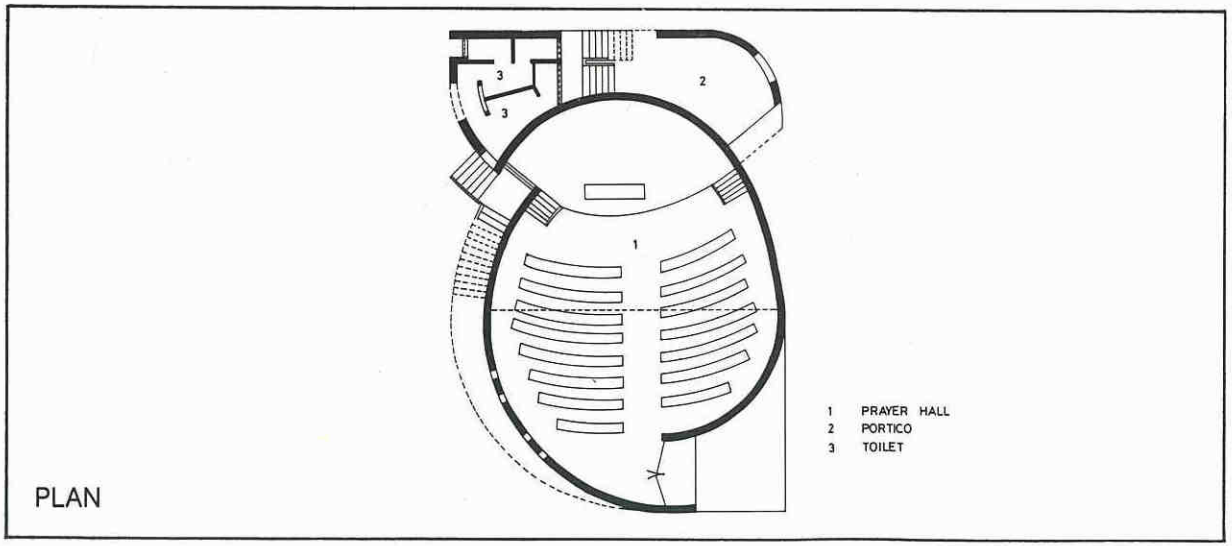
*Architect:* Saakaar Foundation, Chandigarh.

The Church of God located in Sector 41-B of Chandigarh has been designed as a sculpture within a fixed volume of 14 by 20 by 11 metres in accordance with the rather restrictive building byelaws of the Chandigarh Administration. The client's imperative that all the permissible covered area should be made use of to the maximum inch, made the architects' task arduous and challenging. The shape and form of the church had to be distinct in aspect from the box-type architecture of the surrounding buildings.

The church's projecting porch, reminiscent of a steeple, is designed to symbolically welcome the worshippers with folded hands. The free shape of the plan not only ensures a close relationship between the congregation and the chancel but also helps in highlighting the oneness of the congregation. Columns within the double-height prayer hall are intentionally avoided to enable the preacher to maintain eye-to-eye contact with the congregation. As the plot faces the south-west, which is not an ideal alignment because of the glare in the afternoons, the entrance has been designed to face the south-east.

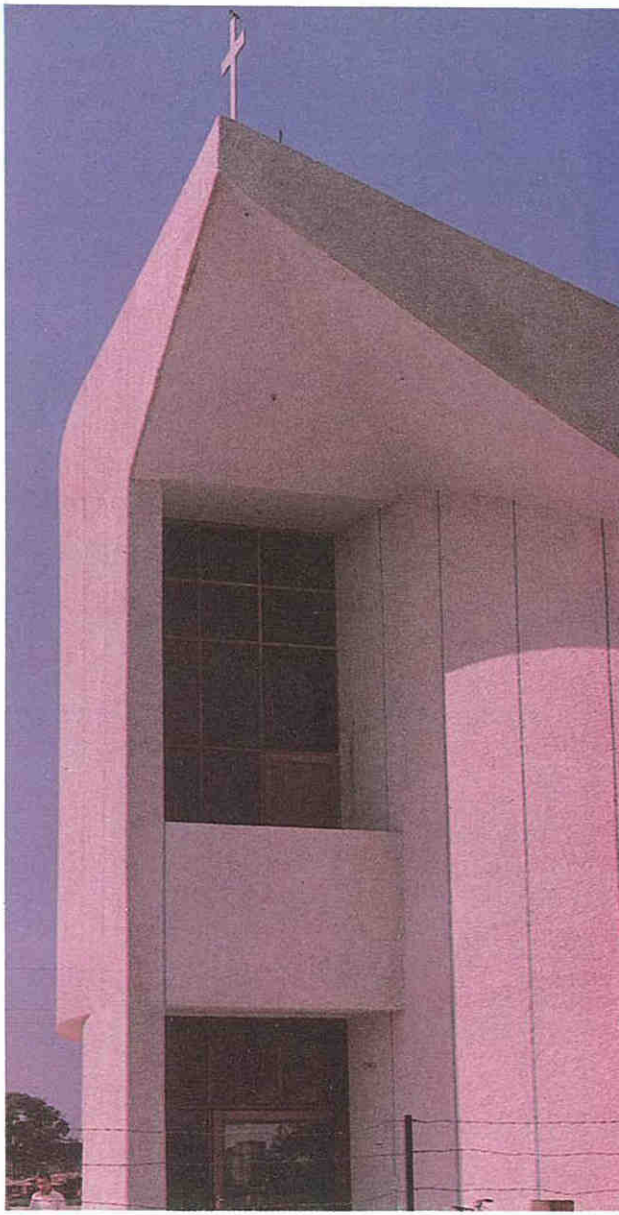
In an effort to create an atmosphere conducive to worship, the interiors are enlivened with an imaginative play of light and shade. The altar has been symbolically emphasised by providing a high window so that a sweep of sunlight floods the area, enhancing its holiness. Very few windows are provided in the seating area so that the activity outside does not distract the worshippers. There are only skylights and slit-windows. These, nevertheless, provide sufficient cross-ventilation and light.

The roof of the prayer hall has vents at the top which permit hot air to rise and escape. Fresh air is drawn in from outside through the slit-windows on a lower level. The prayer hall, portico and toilets are on the ground floor, while the first floor houses a seating balcony, a priest's room and an office.




PLAN

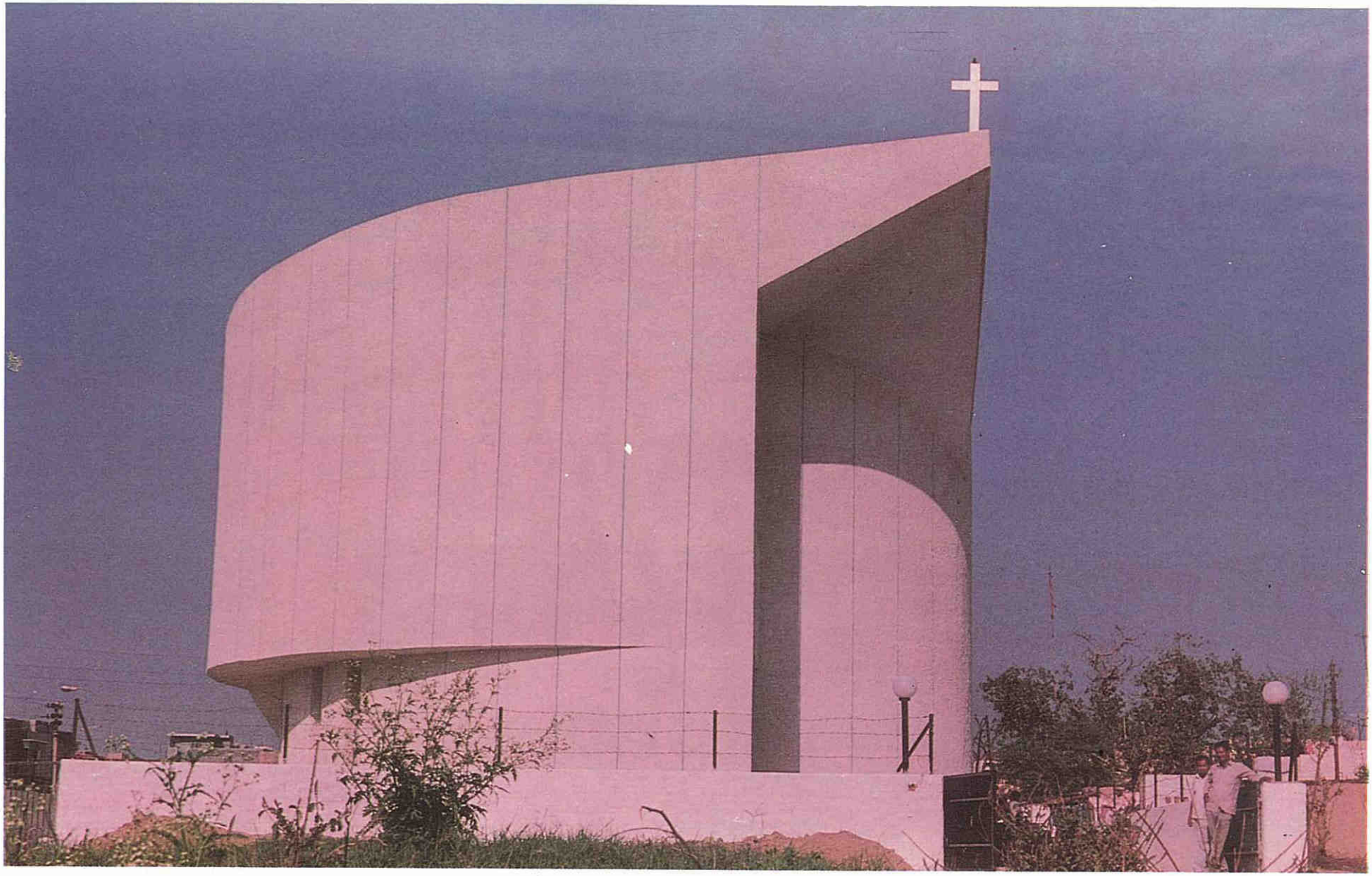
Lord's invitation to devotees



The parsonage has been placed on the second floor to ensure privacy.

The external walls are of thick load-bearing brick masonry while the slabs, beams and lintels are in reinforced concrete. The interiors are plastered to achieve better illumination. The outside surfaces are finished with rough-cast concrete in white cement.

Sculptural expression of prayfulness



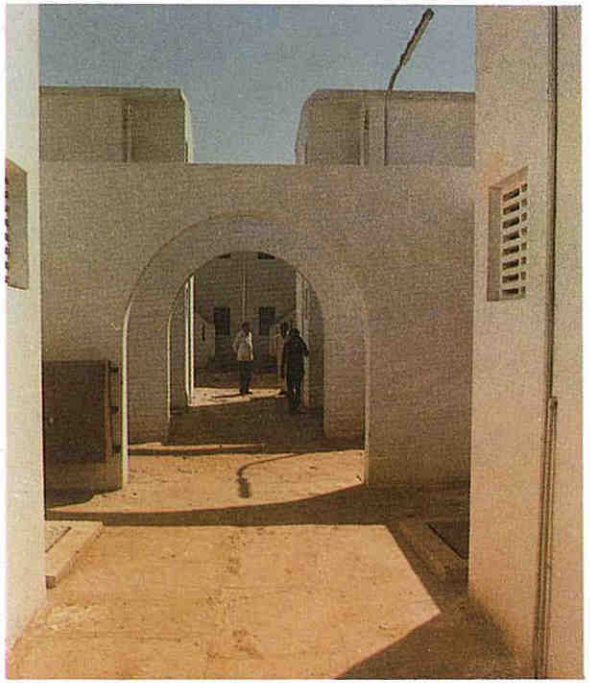
## HOUSING FOR GAS VICTIMS, BHOPAL (1989-90)

*Architect:* M.N. Joglekar, Design and Development Wing, HUDCO, New Delhi.

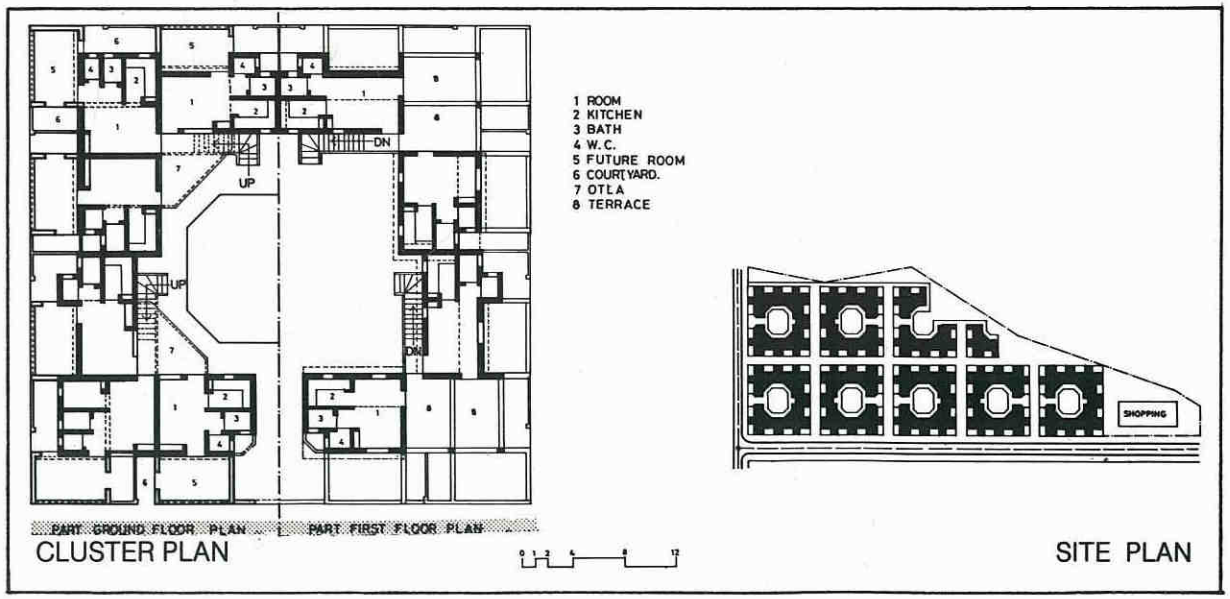
A low-rise, high-density housing complex for the shelterless victims of the ghastly Union Carbide gas tragedy of 1984 is located on Berasia Road in Bhopal. It is designed on the traditional *katra* pattern of housing, which was deemed most practical for harmonious living. In the first phase, 600 dwelling units have been constructed on a site of about 3.5 hectares, thus achieving a density of 171 dwelling units per hectare. For the future, 2,400 more units are proposed in phases.

The design is conceived as two-storeyed units with the facility of adding a room to each dwelling. The houses are organised in cluster condominiums with a single arched entrance which helps in promoting a good neighbourhood environment. Low-rise development was proposed, keeping in view the fact that the beneficiaries, all of whom were ailing, could face difficulties in climbing more than one flight of stairs. A typical cluster of 20 dwelling units has been formed by combining four basic modules of five units each in such a manner that the central open area can be utilised by all the inhabitants for outdoor activities. The size of the courtyard has been kept small in order to avoid encroachments by the residents.

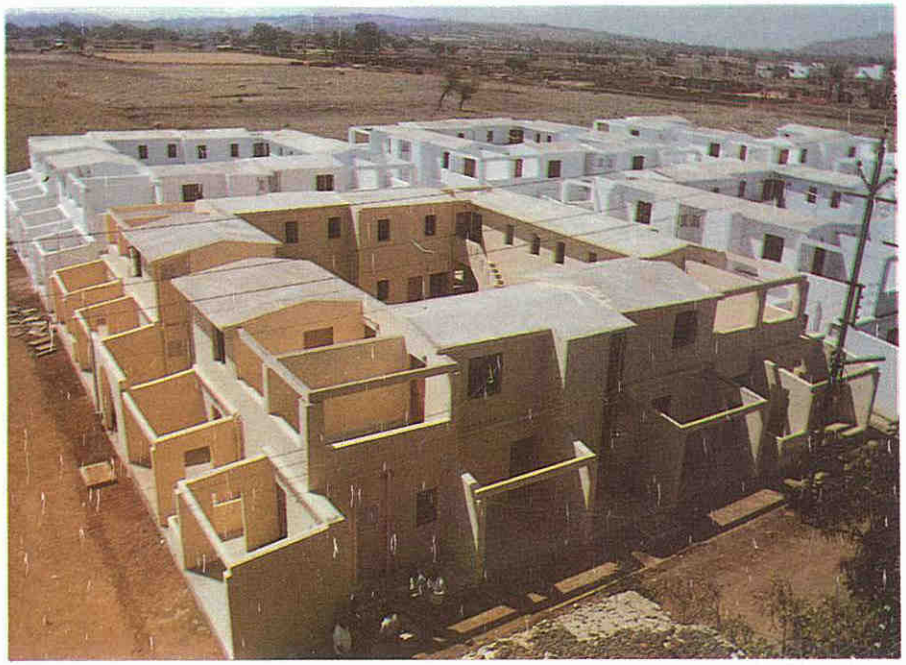
The basic module comprises three units on the ground floor with private courtyards and two units on the first floor with open terraces. The upper units are accessible by a single-flight staircase, which forms an entrance verandah below for the ground-floor units. A sloping roof has been provided for the first-floor units to avoid the possibility of further vertical expansion, thus maintaining elevation and density control. Each dwelling unit has a covered area of 21 square metres, which includes a multipurpose room, a kitchen, a bathroom and a water-closet. In addition, each unit has been provided with 10 square metres of a partially enclosed, partially open area for future expansion. The kitchens and bathrooms are ventilated through opening into a rear lane and are accessible through a lobby which directly opens into the multipurpose room. The clusters are arranged in a repetitive manner along pedestrian lanes. Besides the cluster courtyards, bigger open spaces are also provided for large-scale community functions.



Entry for cluster residents



A street view



Concept of *'katra'* cluster

Courtyard for community

## EUREKA TOWER, HUBLI (1989-91)

*Architect:* Shirish Beri, Kolhapur.

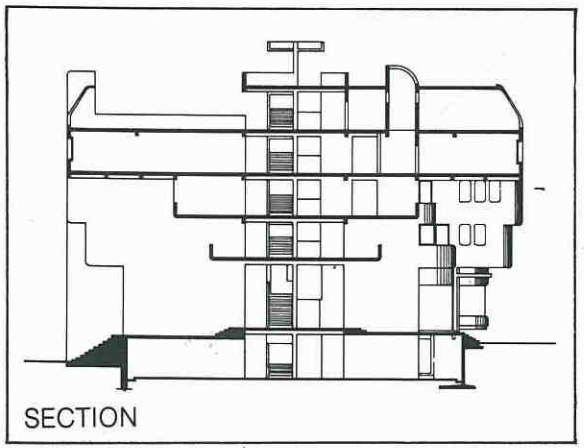
Triangle of site and architecture

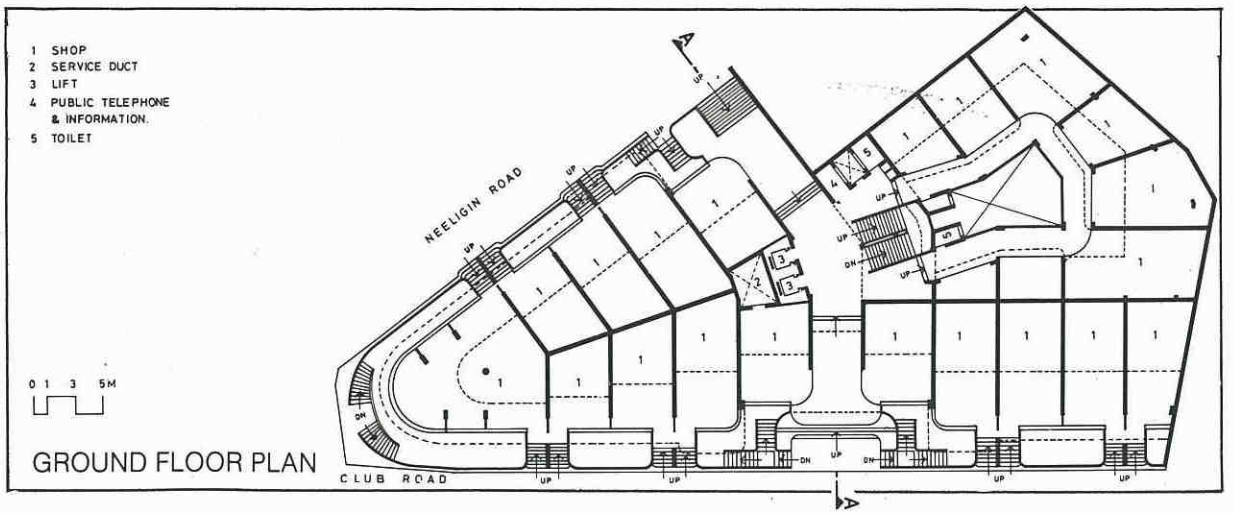
Eureka Tower in Hubli in Karnataka State is built on a 0.14-hectare site between two important roads which converge into a major traffic island.

The building, with 5,600 square metres of built-up area, recognises its environment and integrates itself in the urban fabric of Hubli by creating a thoroughfare through the building, connecting the two roads. The plan of the building does justice to the shape of the site, defining the road junction with a strong curved corner. The triple-height entrances from both roads create a grand sense of arrival.

Each office space is well ventilated and gets adequate light. An effort has been made to minimise the circulation space and create shops and offices of varying sizes to suit different income groups. The shops are placed on the ground floor and in the basement. The offices are accommodated on the first, second and third floors. The roof is designed to serve as a terrace garden-restaurant. Each table is placed near a parapet opening to give a framed view of the city.

The structure has a reinforced-concrete frame with a rough cast plaster finish.



A visual invitation to shopping

Marketology and architecture

## INDIAN INSTITUTE OF HEALTH MANAGEMENT & RESEARCH, JAIPUR (1989-91)

*Architect:* Ashok B. Lall, New Delhi.

Located near Sanganer airport on the outskirts of Jaipur in Rajasthan, the Indian Institute of Health Management and Research has a built-up area of 6,000 square metres. It is devoted to research and training in the management of health systems.

An extensive survey was conducted to study the construction skills and materials resources in the Jaipur region. To maximise the use of local resources, the design has drawn inspiration from the traditions of local architecture as well as the city's crafts. The architectural vocabulary of the building is developed from an appropriate use of a variety of stones for masonry, paving, coping, flooring and pergolas, in conjunction with slender and delicate precast concrete elements.

The campus layout utilises an existing monsoon watercourse as a natural dividing element between the Institute's research, training and administrative buildings and the hostels. A "valley" between the two sets of buildings is crossed by a bridge at the centre of the site, while a causeway at the eastern edge of the valley acts as a dam to impound rain water. This helps in recharging the subsoil water table, apart from adding to the environmental character of the campus.

The strategy for landscape design has been to restrict the use of carefully tended gardens to small defined areas of the courts and the entrance forecourt. the remaining land is planted with shrubs and trees or with indigenous hardy grasses that are allowed to grow "wild".

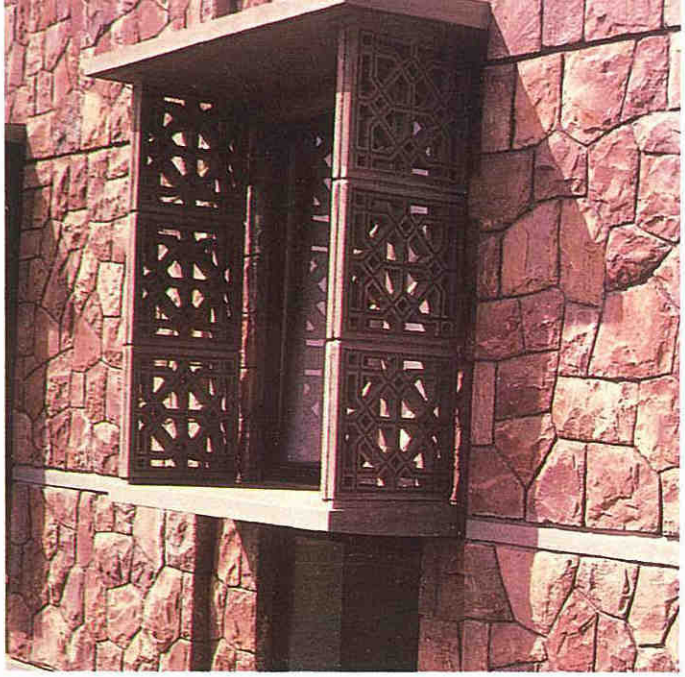
The institutional buildings consist of a faculty court which brings together the research and administrative functions, and an academic court around which the training functions are organised. The organisation of the faculty court spaces allows a modular variation in the size and number of rooms by having removable partitions. Similarly, the classroom spaces in the academic court are designed on a grid which permits the formation of a variety of classroom sizes.

The pattern of fenestration is coordinated with the planning grid. The windows are designed to reduce glare and yet ensure adequate natural light for all work spaces. Small high-level glazing panels supplement the light from the windows by throwing more daylight at the back of the room to give a fairly even illumination level across the depths of the rooms. A ventilator below the window sill serves a dual purpose: it is an adjustable outlet for the air that is distributed to each space by an evaporative cooling system and it can also house a window airconditioning unit without blocking out the view and light.

The cooling plant and service cores are designed to ensure a noise-free and draught-free air-cooling system. With the exception of a few rooms which are airconditioned, all work spaces are served by a built-in evaporative cooling system. Jaipur being a hot and dry area, this system provides a high level of comfort at very little cost.

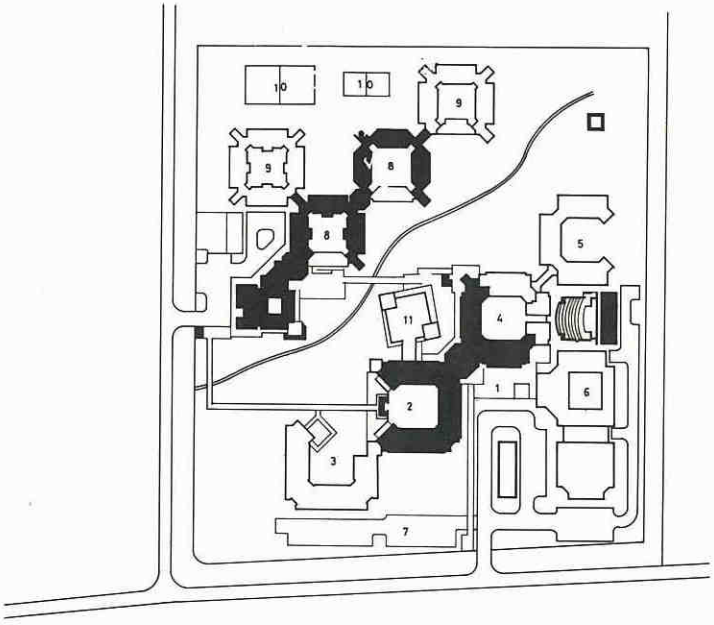
A locally available pinkish stone is used for the load-bearing walls. The rough texture of this stone contrasts with the concrete bands and, along with the precast concrete *jaalis* and *chhajjas*, provides an economical maintenance-free finish. Modern materials such as aluminium, steel and glass are used when specifically called for and are employed with care and precision.

Stones for battens and pillars—in tune with local philosophy



Ornation with functionality: Sun-breaking architecture

Art and craft of architecture




1 ENTRANCE
2 FACULTY
3 FACULTY IN FUTURE
4 ACADEMIC
5 ACADEMIC IN FUTURE
6 CONFERENCE CENTRE IN FUTURE
7 PARKING IN FUTURE
8 HOSTEL
9 HOSTEL IN FUTURE
10 PLAY FIELD
11 LIBRARY IN FUTURE

SITE PLAN

## HEADQUARTERS OF BHOPAL DEVELOPMENT AUTHORITY, BHOPAL (1990)

*Architect:* Anant Raje; *Associate Architect:* Amita Raje, Ahmedabad.

The headquarters complex of the Bhopal Development Authority comprises offices for administration, accounts, planning, etc., besides the Chairman's secretariat, an auditorium for 120 people, an auction hall for 500 people, a canteen, kitchen and dining hall, record rooms and inventory stores. It has a covered area of 3,600 square metres.

The office floors—ground and three upper storeys—are organised with a main circulation corridor giving access to individual cabins with attached toilets on the southern side and to general offices on the northern side. At its two ends the corridor links up with two staircases and general staff toilets, utilities, a switchroom and security personnel spaces. The general offices are so structured in plan as to give attached record rooms, allowing flexible arrangement for the partition of any particular office space if required.

The Chairman's secretariat is at a vantage point on the first floor in the north-west corner with a porch underneath. The access to the secretariat is directly from the porch through elevators and a staircase. This gives the building the image of authority necessary to mark it as a distinctive headquarters in a city growing into a metropolis.

Both the auditorium and the auction hall are situated on the ground floor, the auction hall being two storeys high. This volume for the auction hall was found necessary because of the inevitable crowded conditions and noise. The ceilings of both halls are acoustically treated. Both halls have an internal connection, even though their entry points are separately organised.

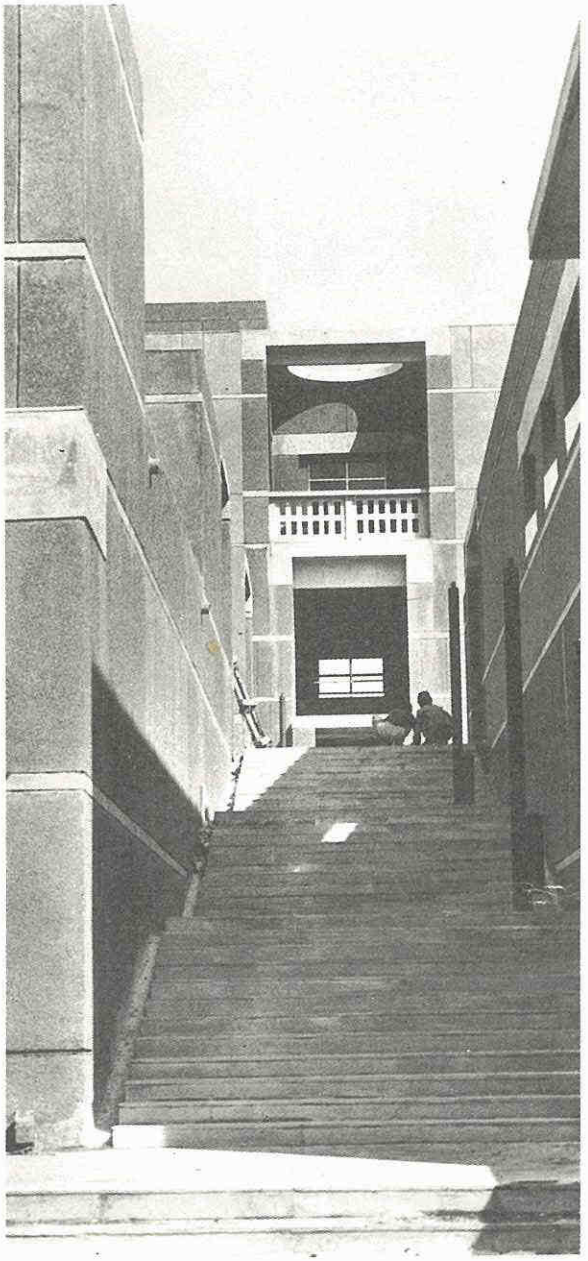
The buildings help in creating an elevated landscaped plaza on the upper level between the office buildings and the halls. The plaza, which is an important feature of the plan, is free from vehicular and other ground-level circulation. It provides approaches to the offices, auction hall, auditorium and the canteen. It is, therefore, a meeting point for all staff members. Sitting under trees on benches affords great pleasure. The plaza is intended to create cooling conditions on the ground floor, circulating the breeze through light-wells on the plaza side to all floors, which themselves are planned for cross-ventilation. An elevated plaza is an urban architectural feature and demonstrates the linking of building groups into a comprehensive planning programme and introduces a three-dimensional feature to the urban fabric.

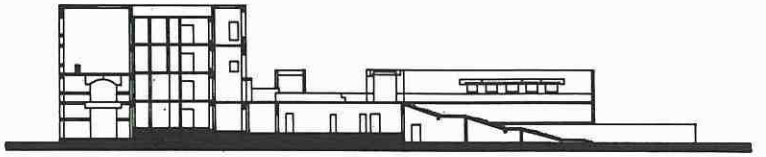
The canteen, workshops and stores building marks the third side of the plaza. The ground floor is given to workshops and stores. The dining hall with an outdoor terrace and the kitchen are located on the first floor. Access to the dining hall is through the plaza. The second floor is reserved for old records and inventory stores, its central position ensuring proper control over filing, stocking and making inventories.

A close and compact plan not only ensures economy in space utilisation, structural design and overall building expenditure but also provides a meaningful solution to the challenge of building in a hot and dry climate.

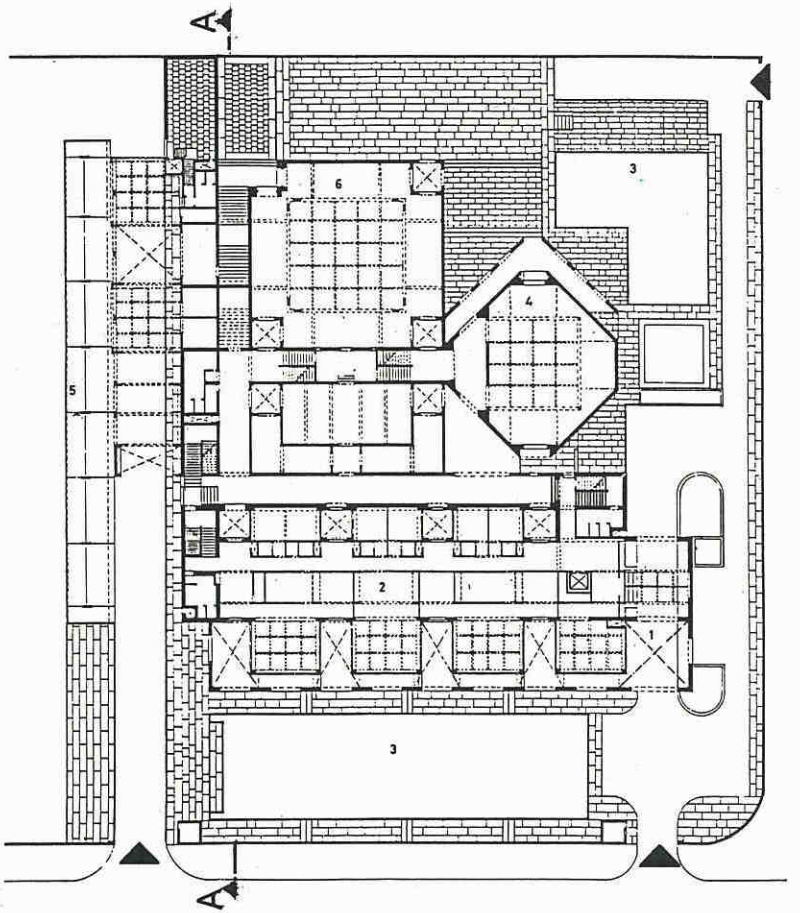
All the buildings in the complex have grit finish expressed in the form of regulated panel formations with exposed concrete lintels and floor bands on the exterior surfaces. The same material also covers the surfaces in the public lobbies, staircase enclosures and the interiors of light-wells and porches. The elevated plaza has rough yellow sandstone paving. The stair steps, lobbies and corridors have polished yellow Jaisalmer stone.

Entering the plaza





SECTION




1 PORCH
2 OFFICES
3 GARDEN
4 AUDITORIUM
5 COVERED GARAGES
6 AUCTION HALL

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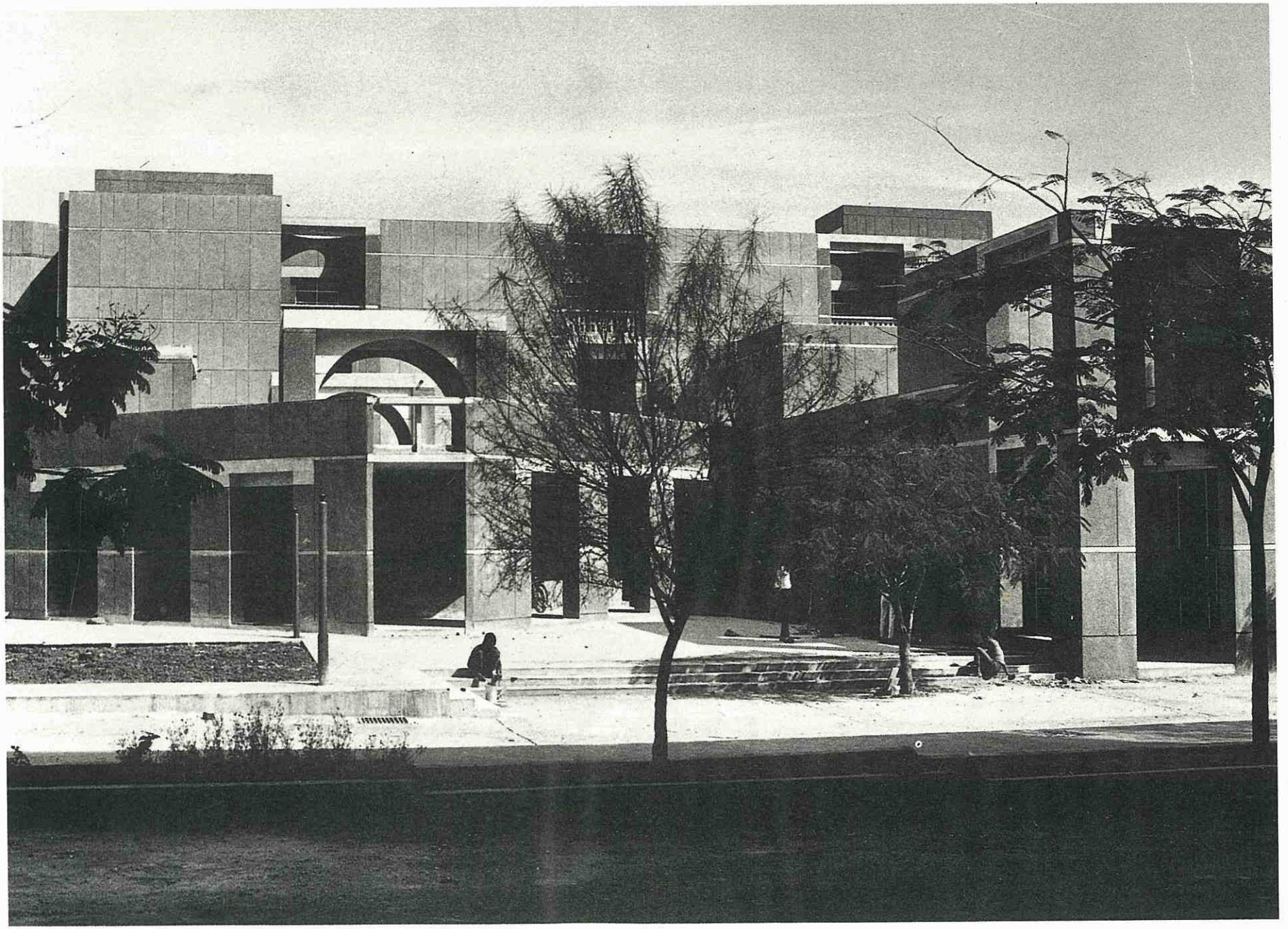
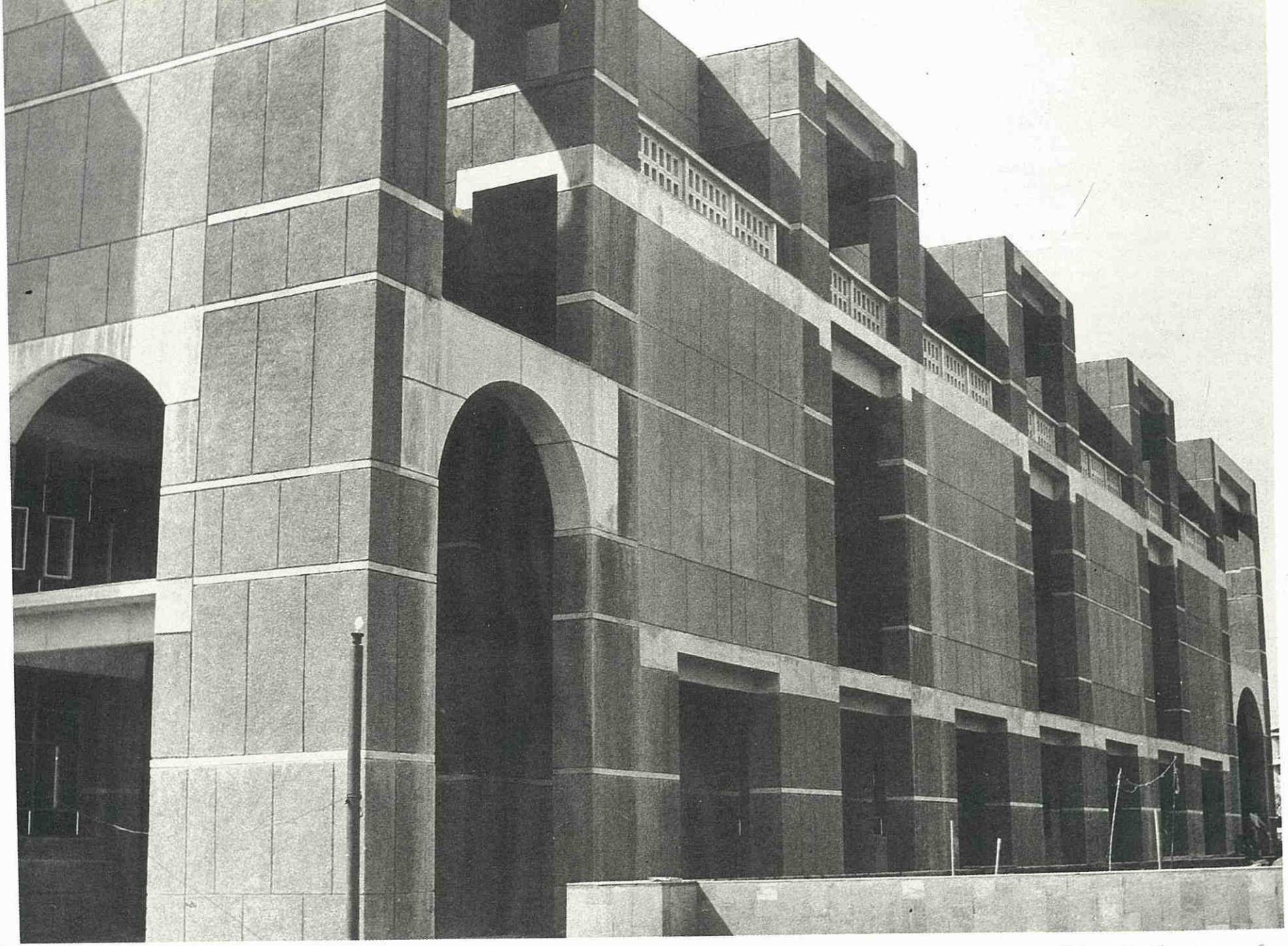
GROUND FLOOR PLAN





Light wells: Climatic sympathy

## BASANT AVAS, AGRA (1990-91)

*Architects:* V.K. Jain & Rana Ram, New

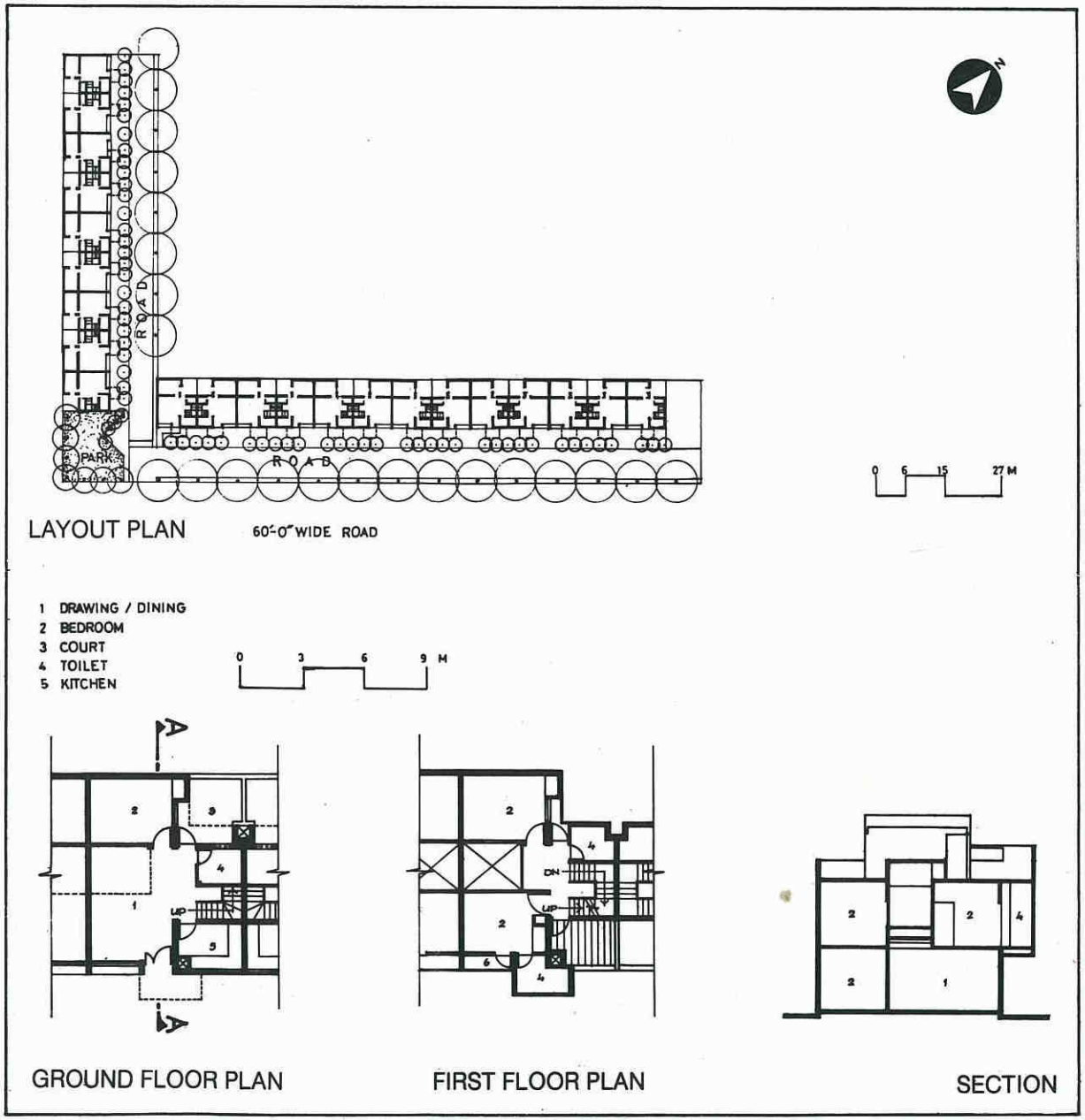
Basant Avas on Mughal Road in Agra, Uttar Pradesh, is a residential complex located in plush residential locality about a kilometre away from the Delhi-Kanpur highway. The L-shaped site measures 0.35 hectare in area.

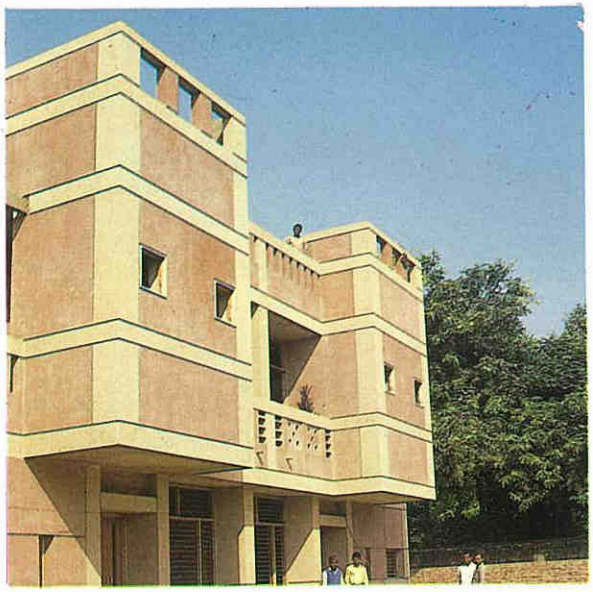
After leaving the mandatory set-backs of 5 metres, the envelope available for building was a very narrow strip of land. The site dictated the plan, which is in the form of two linear blocks, each containing a row of houses. A green space in the corner serves as a children's park. The set-backs have been utilised to introduce access roads within the site.

The client's brief called for the design of independent houses of 120 square metres each. The houses have thus been designed as compact double-storeyed duplex units so that every house has the advantage of a lawn on the ground floor and a terrace at the roof level. The ground floor contains a drawing-cum-dining room, a kitchen, a guest bedroom and a toilet. A flight of steps leads up to the private zone of the house on the first floor, which has two bedrooms and two toilets. A cutout within each unit interlinks the two levels visually and provides light and ventilation to the lower level by means of a skylight at the roof level.

The projections and the recesses in the facade, occurring at regular intervals, create an interesting rhythm of light and shade. The facade is further enlivened by variations in the height of the parapets. Transparency has been achieved by the use of rectangular slits, square openings with sandstone louvers and in-fill panels with circular openings which, although traditional in texture and scale, are modern in treatment.

For the exterior surfaces, a permanent finish has been provided with grit finish using chips of local sandstone.

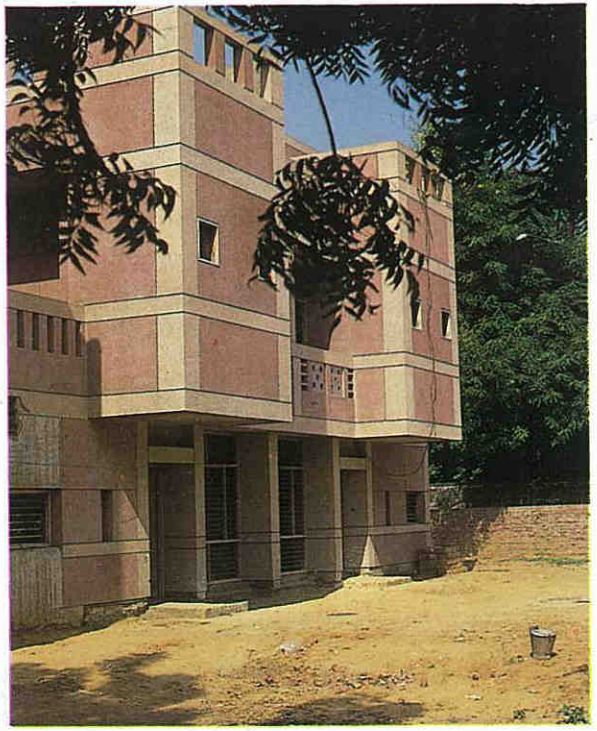




Projections and recessions: An interplay

Synthesis of modernity and tradition

Three-in-one: Entry, blocks and shading

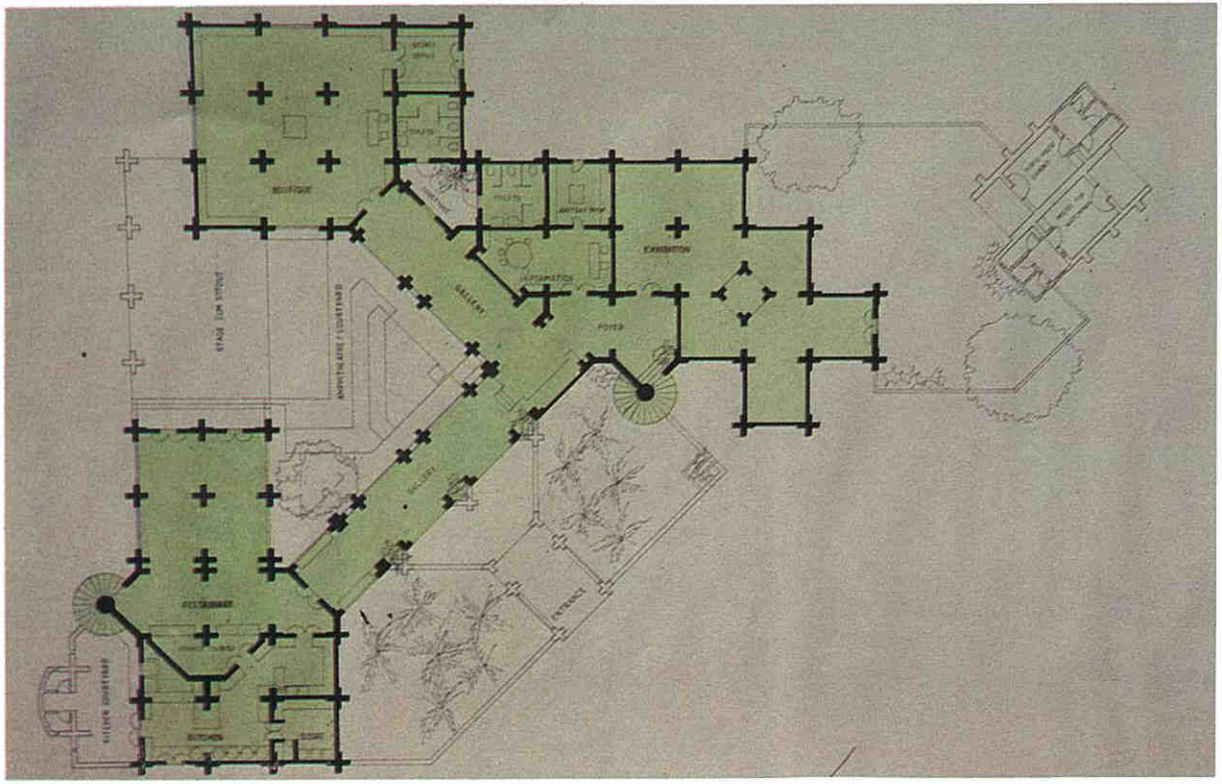


## INFORMATION-RECEPTION CENTRE, AUROVILLE (1990-91)

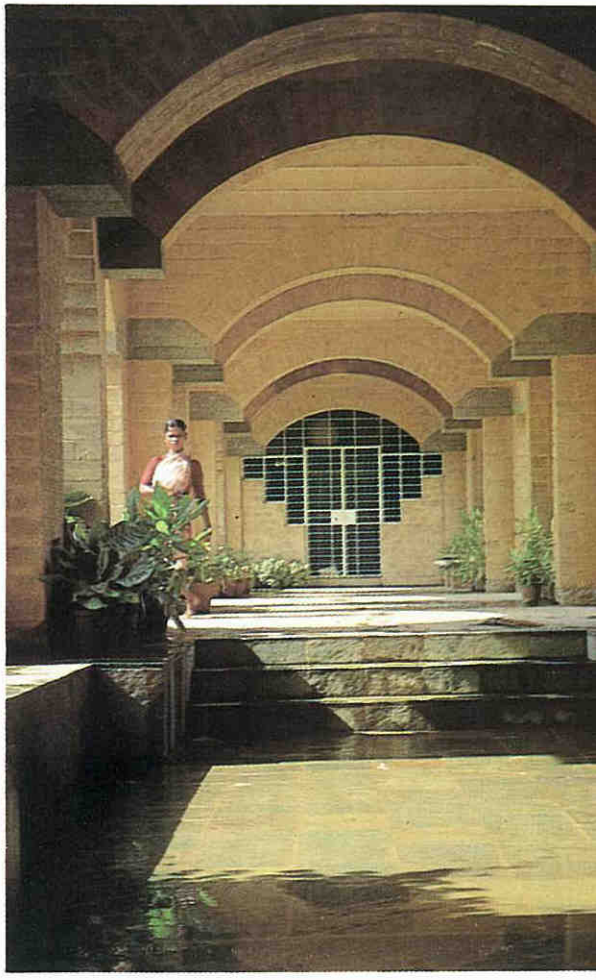
*Architects:* Suhasini Ayer-Guigan and Serge Maini, Auroville.

The Information-Reception Centre in the international zone of Auroville in Tamil Nadu is built on a 1.2-hectare site. The centre, with 1,200 square metres of built-up area, is designed to demonstrate the possibilities of alternative building technologies which make the optimum use of solar, wind and bio-mass energies, water recycling techniques, etc. The project has been conceived to familiarise visitors with the viability of the technologies used and to dispel the social prejudice that mud is a building material meant only for the poor. It has also been aimed at training the local people in block-making and building techniques and to mobilise them for building themselves, using mud. As this building is not connected to the grid of the local electricity board but only taps non-conventional sources of energy, special emphasis has been laid on natural lighting and ventilation.

A sense of direction for the movement of people has been achieved with the orientation of arches and semicovered spaces. In order to reduce the cost and simplify construction, it was decided to adopt a grid of four by four metres in which the columns are load-bearing and all spans are arched or corbelled. The building accommodates an information office, exhibition space, a video room, a restaurant, a shop for handicrafts, conference rooms and toilets. Soil-stabilised blocks are used for the columns, arches and domes. Prefabricated ferro-cement channels are used for the flat roofs. To minimise the use of wood, all the door and window frames are prefabricated with ferro-cement or concrete. The use of reinforced concrete has been restricted.

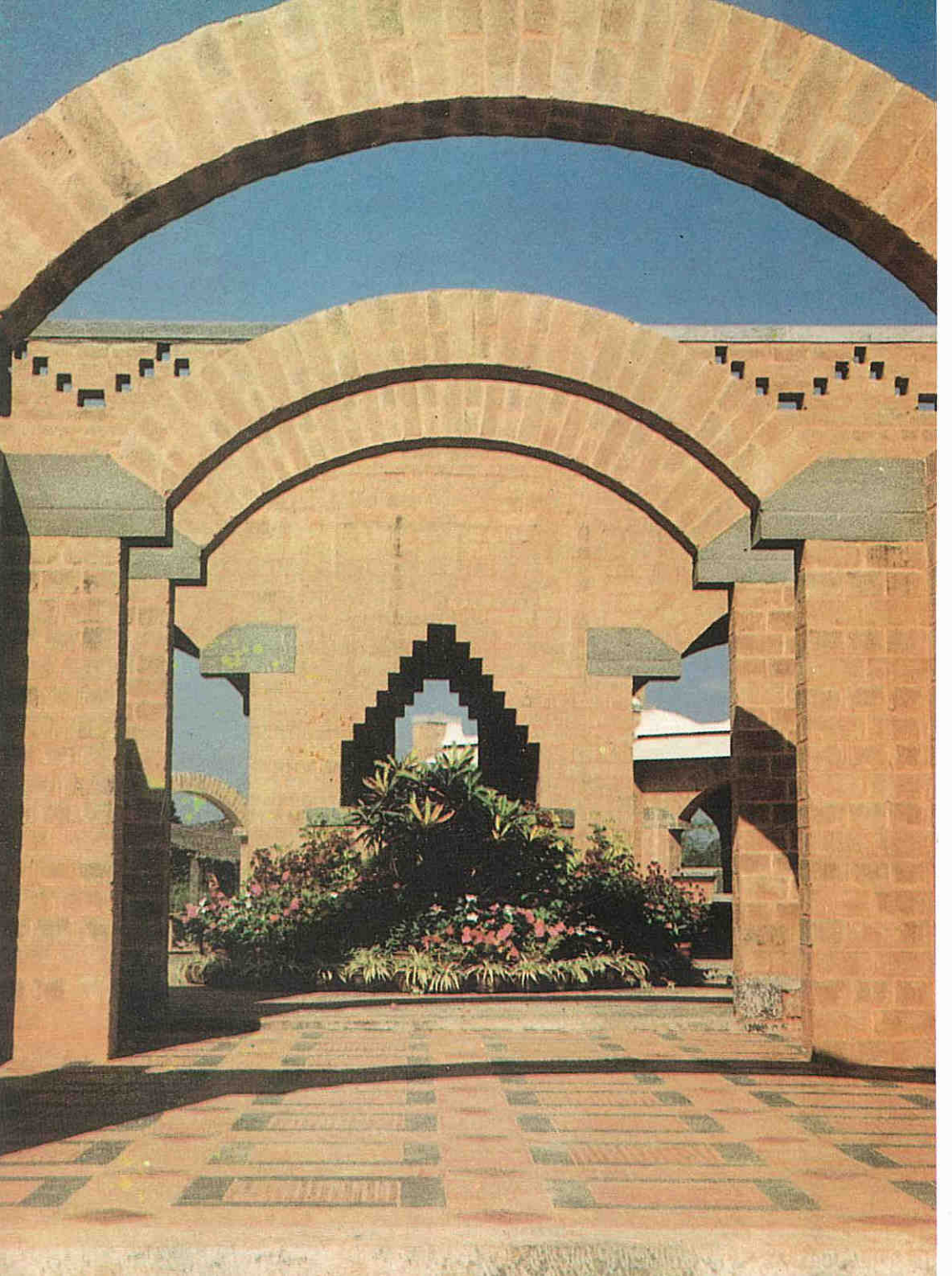


Where information is transformed into wisdom: Entrance gallery



Confrontation with the campus: General view

Arches of spiritualised knowledge: Entrance court



Information–Reception Centre, Auroville

# FUTURISTIC APPROACH

CHAPTER 4

The last few decades have witnessed the mushrooming of new technologies in the affairs of men, leading humanity into a new age. Architectural evolution in such a fast-changing scenario has had a direct effect on our life-styles, needs, resources, and physical environment around us. The old problems and their solutions become infructuous, new challenges confront us and new issues crop up, calling for our immediate attention to cope with the changing world. Like every profession, architecture too needs a thorough review every few years, enabling us to learn from our past successes and failures and helping us evolve new strategies to move in the direction of redefined goals. The divine discontent born of the urge for perfection which every artist feels at the completion of a work forms the germ of a new work. The past few years have witnessed a growing awareness among architects to review matters as they stand. There have been lots of discussions and debates among architects, both at the formal and informal levels. The general consensus that has emerged seems to provide a number of "do's and don'ts," which need to be recorded to form the basis for guidelines for the present and future generations of professionals responsible for the improvement of our built-environment.

When we talk about a futuristic approach for the improvement of our built-environment, it is of foremost importance for us to preserve what we have inherited. The Indian Constitution prescribes one of our fundamental duties as follows: "It shall be the duty of every citizen of India to value and preserve the rich heritage of our composite culture".[1] What our forefathers built is for us a source of inspiration today; and what we build today will, or rather should, inspire future generations. The philosophy of one century is the commonsense of the next. The ruins of historical buildings not only link our past with the present but also make us aware of the continuity in our culture, developed from the pre-historic times to the present. If we want to ensure this continuity, we must preserve anything "which can be looked on as artistic, picturesque, historical, antique or substantial, any work, in short, over which educated artistic people would think it worthwhile to argue at all,"[2] as William Morris, the figurehead of the conservation movement in England, said. We have innumerable examples of built-forms having historical, architectural and archaeological importance in India. All of them have their own significance and contribute to our rich cultural resources. Therefore, these need to be protected from the undesirable developments in the general process of modernisation. The exodus of people from the villages to the cities, lured by better employment opportunities, the advent of new inorganic building materials and technological advancements, spiralling land prices and the commercial exploitation of space, an alarming propensity to succumb to international influences, and rapidly changing land uses are some of the factors which pose a grave threat to our historical built-environment.

Fortunately, we have a number of government, semi-government and voluntary organisations working for the preservation of built cultural heritage in India. Though the emergence of these organisations reveals a healthy professionalism taking root in India, yet a lot needs to be done to make conservation and preservation a broad-based public movement in the spirit of the fundamental duties laid down in the Constitution.

A stupendous task lies ahead. We have to assert and use our influences and resources to create an awareness in society of the need to value and preserve the historical built-environment. The electronic and print media too could come forward in making the preservation of our rich cultural heritage a people's movement—a movement in which they feel palpably what exactly is at stake. Ours is still, largely, a traditional society and the conservation of tradition or its elimination is an important issue in defining the nature of our future development. Any laxity on our part at this moment could result in a far too radical break with tradition, raising questions about the appropriateness of change.

To make conservation and preservation more effective and a people's movement, there is the need to create special heritage cells in the town planning and architecture departments, urban development authorities, municipal corporations, and other such bodies. These cells should be entrusted with the job of identifying heritage zones and buildings of archaeological, historical and architectural importance which require to be preserved and they could also work out necessary strategy plans. There are extraordinary possibilities of judgement in people and they are capable of discerning the difference between what things are and what they ought to be. Therefore, it will be of paramount value if the preservation of our cultural heritage could be entrusted to the masses. In order to involve the people, advisory committees could be formed at the city and town levels. These committees should comprise

prominent citizens from all fields concerned. These could keep an eye on the urban development taking place in their respective areas and inform the authorities of any damage to the historical built-environment. Technical universities, art and architecture colleges and similar institutions need to introduce conservation and preservation as special subjects in their curricula.

These measures could prove catalytic in creating mass awareness of the need to not only protect and preserve our historical settings but also to plan our future in harmony with our past and to see today with the eyes of tomorrow. Only then can we ensure an uninterrupted continuity in our culture. Culture is to know the best that has been said and thought in the world. Tradition is the handing down, from generation to generation, of ideas, opinions, beliefs, customs, and so on. Tradition does not mean a blind adherence to the ways of the previous generation or generations but it is the critical labour of sifting the wheat from the chaff, and of knowing what is good and useful. Tradition can be comprehended only by those who have a historical sense. A historical sense involves a perception of not only the pastness of the past but also of its presence. One who has a historical sense realises that the past exists in the present, and that the past and the present form one simultaneous order, an evolving continuum. Thus a sense of tradition implies a recognition of the continuity of art. It also implies critical judgement as to which of the artistes of the past continue to be significant in the present. Tradition represents the accumulated wisdom and experience of ages. Its knowledge is essential for really great and noble achievements. The conception of tradition is dynamic. Tradition is not something fixed and static. It is constantly changing, growing and becoming different from what it is. It is individual talent which so modifies it. An artiste in the present must seek guidance from the past. But just as the past directs and guides the present so the present alters and modifies the past. When a new work of art is created, if it is really new and original, the whole tradition of art is modified, to a varying extent. The relationship between the past and the present is not like one-way traffic. It is a reciprocal relationship. The past directs the present and is itself modified and altered by the present. The existing monuments form an ideal order among themselves, which is modified by the introduction of the new (really new) works of art among them.

Cities are living entities, and like all living creatures they are susceptible to change. They accommodate growth and new needs as well as satisfy the existing requirements. There is hardly a city which has not outgrown its original purpose of establishment. Technological advancements have further accelerated the rate and scale of change, which in itself is an enduring characteristic of urban development and civilisation. If any change is incremental and gradual, it is likely to get absorbed in the existing urban pattern. But if the scale of change is substantial affecting the urban texture, street picture, or skyline, it could reflect a break in the historical continuity of urban development. Cities are the physical manifestation of a civilisation and represent a vast investment not only in financial terms but also in social, historical and emotional parameters. A writer described them as "tender plants" and cautioned that these must, therefore, be carefully tended. But, unfortunately, the built-environs of our cities, especially those of historical importance, are getting discoloured because of the destruction of historical landmarks, the introduction of ill-conceived and inhuman architectural forms such as high-rise blocks, the increased use of alien materials and unreliable technology and the exclusion of ornamentation on ideological grounds. There is an urgent need to infuse a sense of wider responsibility in the minds of the professionals dealing with historical built-environment. If they cultivate a keen interest in those techniques and designs which are sympathetic to our historical settings, it will go a long way in saving our environs from the unwanted elements of modernism. One of the paramount responsibilities of our fellow professionals entrusted with the task of adding new structures in historically sensitive areas or subtracting old ones from them should be to explore the possibility of avoiding errors right in the beginning.

Efforts should be made to retain what of the past can reasonably be retained and restore it to meet contemporary needs, keeping in view economic, social and emotional factors. Likewise, to encourage the development of new forms of architecture and urban design, appropriate for our times, we should be least hesitant to remove those old structures which have either outlived their purpose or do not meet standards of excellence. If after careful consideration it becomes imperative to build something new in an old setting, the existing structures must be studied minutely to formulate wider design objectives and to know whether their retention is important or change is inescapable. Based on such a prototypical analysis, sincere efforts should be made to develop appropriate design criteria which take into account aspects like urban texture, volume, form, scale, proportions, street picture, silhouette, orientation, solid-void ratio, materials, colour and texture, art and decor and visual complexity. Such design criteria, if sincerely and creatively implemented, can yield better results. Contrariwise, the imposition of pre-conceived and subjective ideas can be disastrous. A further pre-requisite of sympathetic design in a historically sensitive area is the existence of an effective system of development controls which can prevent ill-conceived, pastiche and superficial developments having little or no relevance with the surroundings.

Tomorrow's India will be much more advanced industrially as well as agriculturally. Poetically, industry and agriculture are the fair pledges of the fruitful tree of India. Industrial advancement will result in increased migration from the rural areas to urban centres which, as in the past, are likely to act as magnets for future industries. Statistics show that the percentage of population living in urban settlements will rise from 27 to 44 by the end of

the twentieth century. Agricultural advancement on the other hand will move towards complete or near-complete mechanisation to meet the requirements of food for an ever-growing population. These fast-changing circumstances will drive architects, planners and the other professionals to build faster, but certainly not at the cost of quality because nothing endures but quality. It becomes our bounden duty to provide a livable environment to the future inhabitants and ensure for them the essentials of life like fresh air, pure water and adequate protection against the vagaries of the weather. To meet the needs of the maximum possible sections of society it is imperative to maintain a proper urban-rural balance from all aspects in general and on the socio-economic front in particular. The migration to the urban areas needs to be drastically checked by revitalising the villages and creating centres of activity between the towns and villages. Only then will we be able to make successful Mahatma Gandhi's village rehabilitation programme, which laid emphasis on self-sufficiency, co-operatives and the use of natural and locally available resources. Cities should not be allowed to grow disproportionately. To make them economically viable, manageable and environmentally acceptable units, a unit should be limited to a population of 2 to 15 lakh. In order to have civilised cities, "a master plan must be a closely-knit network of streets and squares with smaller dwelling units, clearly but not boringly structured, making an efficient use of urban spaces, and above all, it must rescue the pedestrians from the nightmare of motor-cars. Planning by 'zoning' is too simplistic and sterile. Variety in urban design, aimed at a complex of streets, squares and open spaces, must be created to enrich the quality of life in cities," as Professor Phillip Opher, Chairman of Joint Centre for Urban Design at Oxford Polytechnic, has said.[3]

The existing cities, with an unregulated flow of mixed traffic, inadequate parking areas, bad road junctions and glaring encroachments creating bottlenecks and slummy conditions, cry aloud for massive renewal programmes. Sincere efforts should be made to find solutions to minimise congestion in the pockets with high-density population and a concentration of industries polluting the environment, to pedestrianise the choked areas and to check all unplanned and haphazard growth along the peripheries of the cities and along the highways. Polluting industries should not be allowed to form part of the general industrial estates. These should be clubbed together in remote areas of the countryside. Luxurious and wasteful low-density areas can be turned to high-density ones so as to make full use of the existing infrastructure. Past experience of high-rise buildings has proved mendacious the long-established notion that the higher you go the more density you can achieve, as these buildings require a lot of breathing space in between. Contrariwise, low-rise buildings can be packed in closer together, thus accommodating higher densities. Economically as well as technically, high-rise buildings have proved to be non-viable and many of them are being demolished in the developed countries. As Oscar Newman put it: "Our survey of urban housing reveals that high-rise elevator buildings as family housing are, at best, a minimal solution, regardless of income group. However, for poor and broken families, for immigrant rural, families new to urban life, the effect of living in a high-rise building is proving catastrophic."[4]

Too tall buildings, particularly for residential purposes, tend to be inhuman, too expensive to justify balanced development. So, considering the socio-economic conditions in this country, efforts should be made to combat this menace of a high-rise culture and pave the way for low-rise, high-density building denominations. In rural or semi-urban areas with lesser land pressure the trend towards low-rise, low-density units needs to be changed to low-rise, high-density structures so as to save precious fertile land for agriculture and afforestation. This will create oxygen and food banks for all living creatures and help in maintaining the ecological balance.

With the rise in development activity, scarcity of energy increases day by day. A majority of the buildings, especially the high-rise ones, are consuming tremendous amount of energy in their operational infrastructure. Lifts, fans, coolers, airconditioning units, ventilation plants, water-pumps and numerous other electrical gadgets and artificial lighting systems are some of the devices with a direct dependence on energy inputs. These devices are no longer items of luxury; they are, rather, necessities of the modern era, and most of today's buildings are little better than dungeons without them.

Although it is virtually impossible to make buildings by totally doing away with such artificial devices of modern living, collective efforts should be made to minimise this reliance. Low-height buildings have a greater potential for energy conservation as compared to high-rise ones, preference should be given to the former. Energy-efficient buildings can be achieved by the following means:

- properly locating the buildings to decrease consequential transportation needs;
- scientifically orienting the layouts so as to take full advantage of the sun and wind for natural lighting, heating and cooling and at the same time rejecting uncalled for glare;
- suitably harnessing solar energy;
- judiciously locating and designing fenestration;
- applying reflective finishes on external surfaces for rejecting unwanted solar-radiation;
- providing cavity walls and ensuring mutual shading for cool interiors;
- carefully selecting low energy building materials for construction; and
- decisively landscaping the surroundings to temper the severity of summer temperatures.

In addition to these design parameters, certain precautionary measures, if adhered to strictly, can prove to be of enormous help in

conserving plenty of energy. These constitute, for instance:

- keeping the general level of lighting low and using spot lighting;
- provision of automatic timer switches for putting off lights when not required;
- avoiding wastage of water used in the sanitary systems;
- using chilled water storage tanks which can be filled when the ambient temperature is low at night so as to be used during the day when the temperature is high; and
- forbidding the operation of lifts upto four floors in high-rise buildings.

Such measures could be given mandatory power by legislation. An energy-audit scheme must be introduced to check the wastage of energy.

During the past few years it has become a fashion to recapture the spirit of the past by imitating historical building vocabularies. In the absence of any research on their relevance to present-day needs, the symbolic imagery and superficial analogousness which they evoke are no justification for rejecting contemporary ideas. Nor does it sound logical to move backwards in the name of tradition and culture since these themselves are not static entities hanging in the past. In the modern context, the historical building styles with old vocabularies have become absolutely unrealistic, impractical and superfluous and hence should not be adhered to. Instead, a contemporary building style which is true to the present times, materials, technologies and aspirations of the people should be followed. About the historical building style, a noted Indian architect, Balkrishna Doshi advised that we should "capture the spirit, the essence and not the style."[5] Commenting on the path to be chosen, he added: "we have to capture what we are ourselves.... what we have to understand is the Indian attitude to life itself.... In Indian society we have a structure in which there are nodes, joints which are flexible. If one could understand that and then work with climate, local resources, etc., then one is really locally right and appropriate for the time. But if one just took an idea like an impression, a photographic impression and imitated it, it would be incorrect... so we should neither follow this method nor should we follow the international style. We have to follow our own path and discover it ourselves."[6] And only when we discover our own path will we be able to contribute our share to the enrichment of our cultural and architectural resources which future generations will have a legitimate claim to feel proud of.

With the expanding avenues of employment in India as well as in foreign countries, technically skilled labour is becoming scarce day by day. This scarcity is more likely to be of an alarming magnitude in the future due to increasing industrialisation and general progress on the economic front. On the other hand, to tide over the embarrassing situation of an acute housing shortage in the country, the pace of development needs to be accelerated. To meet this challenge, we have to immediately pay adequate attention to two streams of construction activity. The first one is to industrialise building activity and adopt more and more standardisation, prefabrication and automation in construction. This will help in achieving economy, accuracy, system, continuity and speed. The second one is to revive vernacular architecture through the use of traditional building materials in the context of contemporary needs and modern technology. As traditional construction skills are no longer passed on to new generations with the same ease as before, it is imperative to impart systematic training to the unskilled masses so as to introduce and encourage the "self-help" element within communities. The "site and services" programme, which has much potential for mass adoption is gathering only snail-paced momentum, if at all, and requires greater impetus.

When we talk about traditional building materials, the first ones which come to mind are mud and biomass. Mud has been the basic building material for centuries the world over and, considering the substantial component of the population living in mud houses, it would be unjustified to treat it as outmoded and reject it outright. Due to its easy availability in varying climes, comparatively low cost, favourable thermal responses, capacity for being used in low-energy production, versatility, plasticity and adaptability, besides the ease with which it can be prepared for building activity, mud is still as relevant a building material as ever before, more so in a country like India with limited resources. What is required is to patronise it and wipe off the stigma that associates mud construction with the rural and the poor. "People say to use mud-bricks for housing is to take a step backwards but in reality it is a step forward,"[7] said Hassan Fathi, a noted philosopher-architect very rightly. We have a stupendous task ahead to restate and redefine the relevance of mud as construction material, to ensure its optimum and efficient use and to integrate it fully in the planning and development process. To highlight the concept of mud architecture and its relevance to rural and urban conditions, full commitment and support from the political and administrative leadership would be required. Considering the acute shortage of housing in the country, limited resources and energy constraints, government and semi-government housing agencies should recognise mud construction as a definite housing solution and make it a part of the development process.

To overcome such disadvantages of mud as its short span of life due to erosion, the extensive maintenance it requires, its low tensile strength and limited structural integrity, considerable research work has already been done, recommending a number of compaction and stabilisation techniques, the use of covering plasters and numerous other architectural and structural formulas. However, in the absence of its proper extension and dissemination among local artisans and home builders, such research has had little impact in the field. Architects and the engineers can, in fact should, contribute a lot in this regard by acting as extension agents and interpreters,

forming a link between the researchers and the users.

Although the lure of modernism has beckoned all in every nook and corner of the country because of the positive qualities it enshrines, its baneful influence on the total environment is undeniable. Its uniformity, coupled with the insensitive design approach of some architects, has led to an architecture totally alien to the local imperatives. This is amply evident from the mushroom growth of the stereotyped, dull, drab and faceless buildings with preconceived skins and pre-eminently devoid of any aesthetic appeal and creativity. The nonconsideration of location and the surrounding environs reflected no regional variations. For instance, the hills are miserably teeming with buildings fit only for the plains. A majority of these buildings are constructed by engineers dominating the public works departments and housing boards or private colonisers with commercial interests. About such "eyesores" as one could call them, Indira Gandhi once remarked that whole ranges of the Himalayas were being ruined by PWDs putting up buildings totally alien to the environment. Following her observation, a high-powered committee was appointed by the Government of India in 1975 to go into the role of architecture in development. A similar committee had also been set up in 1965. Both these committees recommended that the architects should be given total responsibility for a project. But unfortunately no action has been taken on the findings of both these committees. In the absence of their implementation the PWDs are still dominated by civil engineers and the role of government architects has largely been reduced to drawing board architecture.

In most of the cases the architects have no direct contact with the clients and thus have to rely upon engineer intermediaries. Besides, lack of coordination between the structural, public health, electrical and mechanical engineering disciplines further deteriorates the end-result which is evident from most of the recent government buildings. But what is woeful and lamentable about the government is that, instead of patronising architecture as a profession, it encourages commercialism. And as a corollary to this, numerous government, semi-government and private organisations which do not have their own architectural cells still invite quotations from architects willing to undertake their projects and award commissions to the lowest bidders without taking any guarantee from them in terms of quality, creativity, performance and ultimate economy. At the most, what is checked is the quantum of work done previously by the bidders with little concern for quality. Commissioned architects, then, in a bid to make up their losses, indulge in malpractices or such methods as are in contravention of the guidelines established by the Council of Architecture. The victim of the whole state of affairs remains, undoubtedly, the end-product, that is the building itself. Lack of cohesiveness and the casual approach of the various quarters concerned have already done great damage to the environment, but it is never too late to start a nation-wide campaign to arrest further deterioration. Architects, environmentalists and intellectuals from allied fields should collaborate and act as torch-bearers to enlighten the masses about the serious threat to our environs. We should also use our personal influence to both persuade political leaders to check the downhill trend in architecture as well as try to win the government's patronage. Nothing short of a complete overhaul of the system will suffice at this juncture, it seems.

Although our modern built-environments are largely workable, viable and a healthy organisation of spaces, yet a majority of them display a callous disregard for certain basic human instincts. There is an instinctive urge in man to strive for beauty. And since in every person's heart there is a pulse that beats to the vibrations of beauty, the built-environments should gratify this instinctive urge. Uniform heights of buildings and continuous facades which are normally provided as part of planning exercises to discipline urban development, often create insipid and dull situations. The absence of interesting street pictures and skylines, the creative play of solids and voids, chiaroscuro, colour and texture and imaginatively thought of levels further add to the boredom of places. Collective efforts should thus be made to avoid the creation of monotonous forms in the name of continuity, conformity, symmetry and balance. Roofscapes, facades, walkways, water features and street furniture if creatively designed can help a lot not only to give a distinctive look and identity to the built-environment but also to add liveliness and cheerfulness to it.

The extravagant use of colours on the facades of old as well as new buildings often results in riotous street pictures. In our planned development, though we have numerous strict building controls, there seldom exist any colour restrictions in the absence of which cities, streets, and *mohallas*, lose their individuality, impact and the continuity of spaces. Lessons should be learnt from the old town of Jaipur, where the colour pink was mandatory for the facades of its buildings. Sincere efforts should be made in devising appropriate and varying colour schemes and making them compulsory for different clusters of building blocks or segments of old and new towns.

Visual arts like sculptures, murals and frescoes have always been an integral part of our ancient architecture. But in the today's India these are losing their appeal and in the absence of their influence in our contemporary architecture our urban spaces and modern box-like structures not only lend a monotonous and deserted look to our cities but will also ultimately prove disastrous in maintaining our historical continuity. Architects, planners and others associated with urban planning can play a significant role in providing spaces for sculptures, murals and paintings in buildings, piazzas, playgrounds, parks, and gardens to give them the prospects of beauty. Only then will the sculptors and painters of the country be able to contribute their share to the development of a form of art which will not only be expressive of their inner vision but will also reflect the spirit of modern India.

# Notes

Chapter **2**

## FROM IMPERIALISM TO INDIANISM OR REGIONALISM

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2. *Ibid*, p. 91 from *The Times*, October 3, 1912.
3. Quoted in Chriostopher Hussey, *The Life of Sir Edwin Lutyens* (Country Life Ltd., London, and Charles Scribner's Sons, New York, 1950), pp. 280, 277; and Norma Evenson, *The Indian Metropolis: A View Toward the West*, Oxford University Press, Delhi, 1989, p. 105.
4. *Ibid* (Hussey), p. 280, and (Evenson), p. 105.
5. Quoted in Colin Amery, "The Contribution of Lutyens to Planning and Architecture," *The Future of New Delhi*, Eds: E.F.N. Ribeiro and A.K. Jain, Delhi Development Authority, (New Delhi, 1984) p. 10 and Evenson, *The Indian Metropolis*, p. 105.
6. Peter Serenyi, "From Lutyens to Young Indian Architecture: Sixty Years of Housing in New Delhi," *Techniques and Architecture*, August- September 1985, p. 56.
7. *Ibid.*
8. *Ibid.* p. 57.
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10. R.S. Despande, *Modern Ideal Homes for India*. (United Book Corporation, Poona, 1939), pp. 78, 80; and Evenson, *Ibid* p. 169.
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13. *Ibid.*
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15. Evenson, *Ibid*, pp. 236, 237.
16. Nehru's address to the Seminar on Architecture organised by the Lalit Kala Academy Delhi, March 17-21, 1959 and quoted in Malay Chatterjee, "The Evolution of Contemporary Indian Architecture," *Architecture in India*, Electa Moniteur Publication, 1985, p. 126.
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Chapter **3**

## PROJECTS

1. Quoted in S. Bahga, "Chandigarh—The city Beautiful," *Indian & Foreign Review*, 15 June 1987, p. 20.
2. Quoted in Norma Evenson, *Chandigarh*, University of California Press, Berkeley and Los Angeles: 1966, pp. 7, 8.
3. *Ibid p. 8.*
4. *Ibid*, pp. 41, 43.
5. *Ibid*, p. 30.
6. Quoted in Sumand Prasad, "Le Corbusier in India," *Architecture + Design*, September-October 1987, p. 20.
7. M.S. Randhawa, *Flowering Tress in India*, Indian Council of Agricultural Research, New Delhi.
8. Evenson, *Chandigarh*, p. 48.
9. *Ibid.*
10. Evenson, *Chandigarh*, p. 56.
11. *Ibid*, p. 71.
12. Quoted in S.S. Bahga, "The Symbols of Corbusier's Architecture," *Design*, July- September, 1985, p. 21.
13. Quoted in Peter Serenyi, "Timeless but of Its Time: Le-Corbusier's Architecture in India", *Perspecta*: The Yale Architectural Journal, Vol. 20, 1983.
14. Quoted in Jaya Thadani, "Nek Chand in USA," *The Tribune*, July, 19, 1985, p. 4.
15. Quoted in S.S. Bahga, "Inspired by a Dream: Chandigarh's Rock Garden," *Indian & Foreign Review*, 30 April, 1986, p. 28.
16. Quoted in Sarayu Ahuja & Soli Ghaswala, "Tall Order: Le Meridien, New Delhi," *Indian Architect & Builder*, December 1989, p. 12.

Chapter **4**

## FUTURISTIC APPROACH

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3. Quoted in S.S. Bhatti, "Civilised City—A wild Dream?" *The Tribune, March 13, 1986.*
4. *Oscar Newman, "Defensible Space," Design*, April-June 1985, p. 36.
5. Excerpt from Doshi's interview by K.N. Hari Kumar and Nikhil Arni, "Dosi in Bangalore," *Sunday Herald*, Septmber 25, 1983, p. 3.
6. *Ibid.*
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# Project Details

**SECTION I**

• Bhubaneswar
*Client:* Government of Orissa.
*Architect:* Julius Vasz.
• Chandigarh
*Client:* Government of Punjab.
• Capitol Complex, Chandigarh.
*Client:* Government of Punjab.
*Contractors:* The Hindustan Construction Company Limited
• Sanskar Kendra, Ahmedabad.
*Client:* Ahmedabad Municipal Corporation.
• Headquarters of the Mill Owners Association Ahmedabad.
*Client:* Mill Owners Association.
• Panjab University, Chandigarh.
*Client:* Panjab University.
*Consultants:* Agya Ram (Structure).
*Contractors:* Department of Engineering and Construction, Panjab University.
• L.D. Institute of Indology, Ahmedabad.
*Client:* L.D. Bhartiya Sanskriti Vidyamandir.
*Design Team:* U.N. Desai and D.C. Panchal.
*Consultants:* Beacons Private Limited and Gannon Consultants (Structure), R.M. Shah and S.L. Shah (Project Engineers).
*Contractors:* Gannon Dunkerley and Company Limited.
• Talwara Township, Punjab.
*Client:* Punjab Irrigation Department
*Design Team:* Subir Mazumdar, Amar Rajinder Singh, Jagdish Singh and S.G. Nangia
*Consultants:* B.S. Shishodia and Jain (Structure)
• Indian Institute of Technology, Kanpur.
*Client:* Indian Institute of Technology.
*Consultants:* Mahendra Raj and P.R. Phatak (Structure); Russell Wood (Programme architect).
*Contractors:* Amarnath Charanji Lal (Civil).

**SECTION II**

• Indian Institute of Management, Ahmedabad.
*Client:* Indian Institute of Management.
*Consultants:* Mahendra Raj and Sharad R. Shah (Structure); SMPS Consultants (Electrical); Voltas Limited (Mechanical).
*Contractors:* Gannon Dunkerley and Company Limited.
• Administrative Building, Hindustan Machine Tools Limited, Hyderabad.
*Client:* Hindustan Machine Tools Limited.
*Design Team:* P.M.Thacker, P.K. Chowdhury, C.R. Shiva Kumar and R.Sudharashan.
*Consultants:* R.L. Nene (Structure) Hindustan Machine Tools Engineering wing (Electrical Services).
Contractors: V. Parthasarthy and Company.
• Thirty-Eighth International Eucharistic Congress, Bombay.
*Client:* International Eucharistic Congress.
*Consultants:* Suraj P.Subherwal (Structure)
Philips India Limited (Lighting and Sound).
*Contractors:* Chico D' Souza.
• Cultural Centre, Chandigarh.
*Client:* Chandigarh Administration.
• GSFC Township, Vadodara.
*Client:* Gujarat State Fertilisers Corporation Limited.
*Design Team:* M.C.Gajjar, U.N. Desai, D.C. Panchal, S.C. Bhavsar, E. Singleton and C.A. Ventin.
*Consultants:* Mahendra Raj (Structure); R.M.Shah (Project Engineer).
*Contractors:* Departmental.
• Shri Ram Centre, New Delhi.
*Client:* Indian National Theatre Trust.
Consultants: Dr.M. Pancholy (Acoustics); Sitansu Mukherjea (Theatre).
• Space Applications Centre, Ahmedabad.
*Client:* Department of Space, Government of India.
*Consultants:* Vakil, Mehta, Parikh, Sheth and Engineers of the Department of Space (Structure).
*Contractors:* Patel and Company.
• Jodhpur University Extension, Jodhpur.
*Client:* University of Jodhpur.
*Consultants:* Shaman Engineering Company, C.M. Jain (Structure); Technoconsultants (Services).
*Contractors:* Rajasthan State Bridge and Construction Limited, Gordhanji and Company.
• Central Library, Srinagar.
*Client:* Kashmir University.
• Guru Nanak Dev University, Amritsar.
*Client:* Guru Nanak Dev University.
*Consultants:* K.A.Patel and Semac Private Limited (Structure).
• Indian Statistical Institute, New Delhi.
*Client:* Indian Statistical Institute, Government of India.
*Consultants:* Vakil, Mehta and Sheth (Structure); Kanwar Krishen Associates (Electrical).
*Contractors:* Associated Builder (Civil); Janda Electrical Works (Electrical); Pal Engineering Company (Sanitary and Plumbing).
• Gandhinagar
*Client:* Government of Gujarat.
*Design team:* H.K. Mewada, P.M. Apte.

**SECTION III**

• Floating Restaurant, Sirhind.
*Client:* Punjab Tourism Department.
*Consultants:* S.C. Jain (Structure); Public Works Department, Punjab (Services)
*Contractors:* Departmental.
• Milk Processing Plant, Mehsana.
*Client:* Mehsana District Co-operative Milk Producers' Union Limited.
*Consultants:* Vithalbhai Patel (Structure); V.H. Shah (Dairy Engineering).
*Contractors:* Parishram Builders.
• University Auditorium, Tirupati.
*Client:* Sri Venkateswara University.
*Consultants:* SERC, Madras.
*Contractors:* N.T. Patel and Company.
• Matrimandir, Auroville.
*Design Team:* Piero Cicionesi and Paolo Tomassi.
Consultants: Structural Engineering Research Centre.
• Madura Club, Madurai.
*Client:* Madura Club.
• Press Enclave, New Delhi.
*Client:* Press Association Cooperative Group Housing Society Limited.
*Design Team:* J.K. Jain, Ram Paradkar and K. Kakar.
*Consultants:* Semac Private Limited (Structure and Services).
*Contractors:* Competent Construction Company.
• M.C. Zoological Park, Chhatbir District Patiala.
*Client:* Forest Department, Punjab.
*Consultants:* Public Works Department, Punjab.
• Dena Bank, Ahmedabad.
*Client:* Dena Bank.
*Design Team:* Jayant Gunjaria, Arvind Patel and Ramesh Desai.
*Consultants:* Vakil, Mehta and Sheth (Structure); S.K.Murthy (Services).
*Contractors:* Rajesh Builders and H.K. Builders (Civil); Crompton Greaves and Gujarat Electric Company (Electrical).
• Modern School, New Delhi.
*Client:* The Modern School.
*Consultants:* Semac Private Limited (Structure).
*Contractors:* Competent Construction Company.
• Rock Garden, Chandigarh.
*Client:* Chandigarh Administration.
*Consultants:* Engineering Department, Chandigarh.
• National Centre for Performing Arts, Bombay.
*Design Team:* Patell and Batliwala.
*Consultants:* Tata Consulting Engineers (Structure and Mechanical); Dale Keller Associates (Interior); Cyril M. Harris (Acoustics); Claude R. Engle (Lighting).
• Central Institute of Educational Technology, New Delhi.
*Client:* National Council of Educational Research and Training.
*Design Team:* Bulbul Biswas, Raka Chakravarty, Anita Dhar, B.S. Grover, Akshaya Jain, Ajay Miglani, Shantanu Roy and Ashok Sharma.
*Consultants:* Vijay Rewal Associates (Structure); Electrical Consulting Engineers (Electrical); Spectral Services Consultants Private Limited (HVAC); Suri and Suri (Acoustics).
*Contractors:* Ahluwalia Contracts India Private Limited.
• VST Housing, Hyderabad.
*Client:* Vazir Sultan Tobacco Company Limited.
*Contractors:* Surinder Construction Company.
• Nehru Science Centre, Bombay.
*Client:* National Council of Science Museums.
Design Team: P.B. Kalkar.
*Consultants:* Engineering Consultants India (Structure); Kanwar Krishen (Electrical); S.G.Deolalikar (Plumbing); N.C.Gupta(Air conditioning).
*Contractors:* Raunaq International (Civil)
• Indian Institute of Management, Bangalore.
*Client:* Indian Institute of Management.
*Design Team:* K.Varkey, R.S. Kadakia, H.V. Nagendra, B.J. Poonater and H.C. Parikh.
*Consultants:* Mahendra Raj (Structure); S.L. Shah (Project Engineer).
*Contractors:* South India Corporation Private Limited, Balaji Engineering and Construction Works, Gina Engineering Company.
• Sri Dasmesh Academy, Anandpur Sahib.
*Contractors:* V.K. Construction Company and Pawan Kumar Jain and Company.
• Low-Cost Housing, Rajkot.
*Client:* Rajkot Municipal Corporation.
*Consultants:* C.H. Shah (Structure).
• Sangath, Ahmedabad.
*Client:* Balkrishna Trust.
*Design Team:* J. Joshipura, S. Patankar and H.M. Siddhpura.
*Consultants:* G.A. Tambe (Structure); B.S. Jethwa and Y. Patel (Project Engineers).
• Administrative Complex, Madhya Pradesh Electricity Board, Jabalpur.
*Client:* Madhya Pradesh Electricity Board.
*Design Team:* S.C. Bhavsar, S. Patankar and A.P. Thakore.
*Consultants:* Stein, Doshi and Bhalla (Structure); S.L. Shah (Project Engineer).
*Contractors:* Tarapore and Company.
• Beach House, Bombay.
*Client:* Tata Electric Companies.
*Design Team:* Brinda Somaya and Ranjini Kalappa.
*Consultants:* Ghadiali and Raval (Structure).
*Contractors:* Ratanshi Tejshi Company (Civil).
• Asian Games Village, New Delhi.
*Client:* Delhi Development Authority.
*Design Team:* Akshaya Jain, N. Sheshadri, Arvind Mathur, Suresh Verma, V.K. Jain and Anita Dhar.
*Consultants:* Patel and Associates (Structure); M. Shaheer (Landscape); Kanwar Krishen Associates (Electrical).
*Contractors:* Anant Raj Agencies, Jeevan Builders and Bindra Builders.
• Asiad Auditorium, New Delhi.
*Client:* Delhi Development Authority.
*Consultants:* Semac Private Limited (Structure); Dr. M. Pancholy (Acoustics).
*Contractors:* Suresh Jain.
• Gandhi Labour Institute, Ahmedabad.
*Client:* Gandhi Labour Institute.
*Design Team:* U.N. Desai and A. Khale.
*Consultants:* C.H.Shah (Structure); S.L. Shah (Project Engineer).
*Contractors:* H.K. Construction and Company.
• Baha'i House of Worship, New Delhi.
*Client:* National Spiritual Assembly of the Baha'is of India.
*Consultants:* S.G. Deolalikar, S.N. Mathur (Plumbing and Electrical); Fariburz Sahba (Landscape); Flint and Neill Partnership (Structure).
*Contractors:* Larsen and Toubro ECC Construction Group.
• Majorda Beach Hotel, Goa.
*Client:* Eastern International Hotels Limited.
*Consultants:* Semac Private Limited (Structure).
*Contractors:* B.L. Kashyap and Sons.
• SCOPE Office Complex, New Delhi.
*Client:* Standing Conference of Public Enterprises.
*Design Team:* Anita Dhar, V.K. Jain, Divya Kush, Anshu Mahajan, Rana Ram and, Suresh Verma.
*Consultants:* Engineering Consultants India (Structure); Kanwar Krishen Associates (Electrical); S.G. Deolalikar (Sanitary); M. Shaheer (Landscape); Suri and Suri (Acoustics); Gupta Consultants (Air-conditioning).
*Contractors:* National Building Construction Corporation.

**SECTION IV**

• Low-cost Housing, Vysankere.
*Client:* Sandur Manganese and Iron Ores Limited.
*Consultants:* R.S. Mandrekar (Structure and Public Health); H.N.A.Narayan(Electrical).
• Hotel Le Meridien, New Delhi.
*Client:* C J International Hotels Limited.
*Architects:* (Part Work): Bhardwaj and Bhardwaj, New Delhi.

*Consultants:* Sterling Engineering Consultancy Services Private Limited (Structure); Spectral Services Consultants Private Limited (HVAC/Electrical); R.K. Gupta and Associates (Plumbing/Fire fighting).
*Contractors:* Tirath Ram Ahuja Private Limited (Civil); Voltas Limited (HVAC); S. Sony and Company (Plumbing); Ambassador Electrical Corporation (Electrical); Mather and Platt (Fire fighting).

• Aranya Township, Indore.
*Client:* Indore Development Authority.
*Design Team:* H.H. Parikh.
*Consultants:* Environmental Engineering Consultants (Engineers); Departmental Engineers (Project Supervision).
*Contractors:* Departmental.

• IIMC Students' Hostel, Calcutta.
*Client:* Indian Institute of Management.
*Design Team:* V.P. Sanon, P.M.Sen and P.B. Das.
*Consultants:* P.R. Kanjilal (Structure); Project Consultants (Electrical); A.C. Mitra (Sanitary and Plumbing).

• School of Architecture, Institute of Environmental Design, Vallabh Vidyanagar.
*Client:* Parisar Trust.
*Consultants:* A. Chirmade (Structure).
*Contractors:* Himmatbhai Patel and Company.

• Delhi Public School, NOIDA.
*Client:* Delhi Public School Society.
*Design Team:* S.R. Sikka, A.A. Ghare and Rita Girotra.
*Consultants:* Mehro Consultants (Structure); ESCON (Electrical); R.K. Gupta and Associates (Plumbing).
*Contractors:* Grover and Associates.

• Sri Dharamsthala Manjunatheshwara Institute of Engineering and Technology, Dharwad.
*Client:* Shri Dharmasthala Manjunatheshwar Educational Society.
*Design Team:* K.S. Beri, R.K. Joshi, S.V. Kumthekar, Y.D. Kulkarni and P.Y. Karambalkar.
*Consultants:* Pramod Beri and R.S. Beri (Structure); G.K. Deuskar (Electrical).
*Contractors:* Surendra Construction Company (Civil).

• Babylon Apartments, Calcutta.
*Client:* Babylon Apartments Private Limited.
*Design Team:* Susmita Deb.
*Consultants:* M.K. Roy (Structure)

• Mahindra and Mahindra Head Office, Bombay.
*Client:* Mahindra and Mahindra.
*Consultants:* Sterling Engineering Consultancy Services Private Limited (Structure).

• Lakeside Holiday Home, Lonavala.
*Client:* Tata Electric Companies.
*Design Team:* Brinda Somaya, Ranjini Kalappa, Sandeep Gore and Vikas Haldankar.
*Consultants:* Ghadiali and Raval (Structure).
*Contractors:* Shiv Enterprises (Civil).

• Corporate Office Complex, Pune.
*Client:* Bajaj Auto Limited.
*Consultants:* S.M. Muzumda (Structure); I.C. Parikh (HAVC); and Burjor Mistry (Acoustics).
*Contractors:* S.Y.Samal and Company (Civil); N.R. Jasani and Company (Interior Furnishing).

• National Institute of Immunology, New Delhi.
*Client:* National Institute of Immunology.
*Design Team:* Saran Bhatia, Anita Dhar, B.S. Grover, Akshaya Jain, Jyoti Kohli, Anil Sharma, Ashok Sharma, Goving Sullibhavi and Reena Surana
*Consultants:* Vijay Rewal (Structure); M. Shaheer (Landscape).
*Contractors:* Ahluwalia Contractors India Private Limited and Chawla Techno Company.

• SAIIER Primary School Campus, Auroville.
*Client:* Sri Aurobindo International Institute of Educational Research.
*Consultants:* AVES (Electrical), Vaya (Colours).
*Contractors:* S.A.I.I.E.R., Construction Department, Pierre L., Uli.

• Engineering College, Kota.
*Client:* Rajasthan State Bridge and Construction Corporation Limited.
*Consultants:* Sharad R. Shah (Structure); Tech. Consultants (Services); Kishore D. Pradhan (Landscape)
*Contractors:* Rajasthan State Bridge and Construction Corporation Limited.

• Indian Institute of Foreign Trade, New Delhi.
*Client:* Indian Institute of Foreign Trade, Ministry of Commerce, Government of India.
*Consultants:* P.R. Phatak (Structure); Kanwar Krishen (Electrical); Nirmal Gupta (Air-conditioning); Radhey Shyam (Landscape).

• Garware House, Nasik.
*Client:* Garware Plastics and Polyester Limited.
Design Team: Brinda Somaya, Ranjini Kalappa and Sandeep Gore.
*Consultants:* Naik Consultants Private Limited (Structure).
*Contractors:* Manhar Dahisaria (Civil).

• Entrepreneurship Development Institute, Ahmedabad.
*Client:* Entrepreneurship Development Institute of India.
*Design Team:* Jayant Gunjaria and Arvind Patel.
*Consultants:* Vakil, Mehta and Sheth (Structure); S.K. Murthy (Services); P.B. Bhagvat (Landscape).
*Contractors:* Gannon Dunkerly and Company.

• Indira Gandhi Institute of Development Research, Bombay.
Consultants: Sharad R. Shah (Structure); Tech. Consultants (Services); Kishore D. Pradhan (Landscape); R.L. Parmar (Approvals); Suri and Suri (Acoustics); Prof. Salve (Muralist); Unik Engineering Services (Electrical).

• Planetarium Complex, Bangalore.
*Client:* Bangalore City Corporation.
*Consultants:* Dr. C.S. Viswanath, Torsteel Research Foundation India (Structure).
*Contractors:* N. Vasudeva Raju.

• Food Crafts Institute, Bhopal.
*Client:* The Food Craft Institute.
*Consultants:* P.T. Gala (Structure)
*Contractors:* Ravi Construction Company.

• Taj Bengal Hotel, Calcutta.
*Client:* Indian Hotel Company Limited.
*Design Team:* Atul Roy, Sagari Jamalabad and Seema Mittal.
*Consultants:* SPA Consultants Private Limited (Structure); S.K. Murthy Consulting Engineers (Services); Mrs. E. Kerkar (Interiors). Mohammed Shaheer (Landscape);
*Contractors:* G.S. Luthra and Sons (Civil).

• Triveni Tirath Campus, Kalsar.
*Client:* Triveni Tirth Education Trust.
*Consultants:* Harshad Parmar and Sudhir Badami (Structure); Kishore Pradhan (Landscape).
*Contractors:* Nagjibhai and Jagubhai.

• Punjab Arts Council Building, Chandigarh.
*Client:* Punjab Arts Council.
*Consultants:* K.A. Patel (Structure); R.L. Bagga (Electrical); Harpal Singh (Public Health).
*Contractors:* P.L. Dua and Sons.

• Swimming Pool, Panchgani.
*Client:* Sanjeevan Vidyalya Trust.
*Consultants:* Pramod Beri (Structure); Sumitra Awchat (Landscape); G.K. Deuskar (Electrical); Chloro Filter (Filtration Plant).

• Commercial Complex, Trichur.
*Consultants:* K. Ramakrishnan and Dr. R.P.R. Nair (Structure).
*Contractors:* Puthiyedeth Construction

• Kufri Resorts, Kufri.
*Client:* Kufri Resorts Private Limited.
*Design Team:* S.D. Sharma, Sangeet Sharma and Purnima Sharma.
*Consultants:* S.D. Sharma and Associates.

• Staff Housing, New Bombay.
*Consultants:* Parikh and Kulkarni (Structure); Geeta and Associates. (Electrical).
*Contractors:* Vaibhav Construction Company.

• Centre for Development Studies and Activities, Pune.
*Client:* The Centre for Development Studies and Activities.
*Design Team:* Rajiv Vishwas Rao, Manisha Boradkar, Gautam Balsekar, Madhav Joshi and Nikita Oak.
*Consultants:* C.E. Godse and Associates (Structure)
*Contractors:* Dinshaw and Dinshaw.

• SOS Children's Village, Bhopal.
*Client:* SOS Children's Villages of India.
*Design Team:* Naveen Kulshreshtha, Sharadbala Joshi and Rahul Vatsyayan.
*Consultants:* Engineering Consultants, India (Structure); Fluid Flow Consultants Private Limited (Plumbing); Spectral Services Consultants Private Limited (Electrical).
*Contractors:* H.S. Khan and Sons.

• Oakshott Place, Bangalore.
*Client:* Spencer Estates Limited.
*Design Team:* P.M. Thacker, S.B. Vasukiprakash and C. Gopinath Rao.
*Consultants:* Semac Private Limited (Engineering); Nina Chandavarkar. (Landscape).
*Contractors:* Tarapore and Company.

• Central Co-operative Bank Complex, Jalandhar.
*Client:* Co-operative Bank, Jalandhar.
*Consultants:* K.K. Aggarwal (Structure).

• Officers' Flats, Patiala.
*Client:* Punjab State Electricity Board.
*Consultants:* M.P. Sharma and Bhatia (Engineers).
*Contractors:* Department Engineers.

• NDDB Staff Housing, NOIDA.
*Client:* National Dairy Development Board.
*Design Team:* Vipin Gupta and Atul Roy;
*Consultants:* S.V. Damle (Structure); D.V. Mawkin (Plumbing); H. Anne (Electrical); Mohammed Shaheer (Landscape).
*Contractors:* Puran Singh, Sherjung Singh.

• New Market Redevelopment Project, Calcutta.
*Client:* Municipal Corporation, Calcutta.
*Consultants:* Development Consultants Limited.

• Rest House, Seoni.
*Client:* M.P. Rajan.
*Consultants:* EPCO Design (Engineers).
*Contractors:* Departmental.

• Bookwing Printing Press, Dantali.
*Client:* Bookwing Publications and Trading Private Limited.
*Consultants:* C.H. Shah (Structure).
*Contractors:* MEC Structural Systems Private Limited (Roof).

• Indian Institute of Forest Management, Bhopal.
*Client:* Indian Institute of Forest Management.
*Consultants:* Sharad R. Shah (Structure); Dr. P.C. Jain, Spectral Services
Consultants Private Limited (Mechanical).
*Contractors:* Bhopal Development Authority.

• New Howrah Station and Rail Yatri Niwas, Calcutta.
*Client:* Indian Eastern Railway.
*Consultants:* Development Consultants Limited.

• CIDCO Public Housing, New Bombay.
*Client:* City and Industrial Development Corporation of Maharashtra Limited.

• Youth Hostel, Ropar.
*Client:* Government of India, Ministry of Human Resource Development, Department of Youth Affairs and Sports.
*Design Team:* S.S. Bahga, Yashinder S. Bahga and Data Ram.
*Consultants:* Central Public Works Department (Structure).
*Contractors:* Sethi and Karam Singh.

• Bharatiyam Gram, New Delhi.
*Client:* Sports Authority of India.
*Design Team:* Anil Laul, Vijay Kapur, Ranbir Mudaliar, Amita Kansal, Bheemesh, Sumita Gupta, Sunil Kumar Gupta, Sanjay Sen Chaudhary, Meera Saluja, P. Singh and Dharampal.
*Consultants:* Subash International (Public Health)
*Contractors:* Nizamuddin Building Centre.

• Jawahar Bhavan, New Delhi.
*Client:* Jawahar Bhavan Trust.
*Consultants:* Sterling Engineering Consultancy Services Private Limited (Structure); Spectral Services Consultants Private Limited (Services).
*Contractors:* ECC Construction Group (Civil, Electrical and Plumbing); Blue Star (HVAC)

• Falcons Crest, Bombay.
*Client:* Tata Housing Development Company Limited.
*Consultants:* U.N. Kamath (Structure); R.G. Chawla and Company (Municipal Architects).

• Titan Watches Complex, Bangalore.
*Client:* Titan Watches Limited.
*Design Team:* P.M. Thacker, S.B. Vasuki Prakash, V. Srinivasalu, V. Suryanarayanan, A.G.K. Raviprakash, Navin Jolly, Xerxes Desai, Anil K. Manchanda, R.C. Harirao, I.K. Amitha, M.S. Shantha Ram, Dwarkanath Vasanth Nangia, M.K.P. Iyengar and Sheth.
*Contractors:* Tarapore and Company (Civil and Plumbing Works)

• Church of God (Full Gospel), Chandigarh.
*Client:* Church of God (Full Gospel), India.
*Design Team:* S.S. Bahga, Yashinder S. Bahga, and Data Ram.
*Consultants:* R. Tirath Singh (Structure); Sudhakar (Services).
*Contractors:* G.K. Narang and A.D. Builders.

• Housing for Gas Victims, Bhopal.
*Client:* Government of Madhya Pradesh.
*Design Team:* M.N. Joglekar and S.K. Goel.
*Consultants:* D.P. Singh (Structure); S. Gera (Services).
*Contractors:* Vaswani Brothers.

• Eureka Tower, Hubli.
*Client:* Shreya Associates.
*Consultants:* Pramod Beri, R.S. Beri (Structure); G.K. Deuskar (Electrical).

• Indian Institute of Health Management and Research, Jaipur.
*Client:* Society for IIHMR.
*Consultants:* Engineering Consultants, India (Structures); Spectral Services Consultants Private Limited (Electrical and HVAC); Deolalikar Consultants Private Limited (Public Health).
*Contractors:* Gurbakhsh Singh, B.A. Builders Private Limited (Civil & Plumbling); Anita Electricals (Electricals); Voltas Limited (Air-conditioning); Suvidha Engineers India Private Limited (Air-cooling).

• Headquarters of Bhopal Development Authority, Bhopal.
*Client:* Bhopal Development Authority.
*Consultants:* Sharad R. Shah (Structure); Dr. P.C. Jain, Spectral Services Consultants Private Limited, (Mechanical).

• Basant Avas, Agra.
*Client:* Parmar Builders Private Limited.
*Consultants:* Vinod Mutneja (Structure).

• Information-Reception Centre, Auroville.
*Client:* Auroville Foundation.
*Consultants:* Auroville Building Centre.
*Contractors:* Appropriate Building Technology, Centre for Scientific Research.

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