

RETHINKING NEW DELHI :
Design Studies on the Densification of a Colonial City

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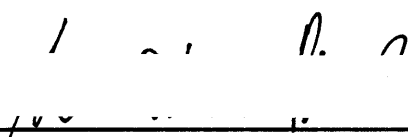
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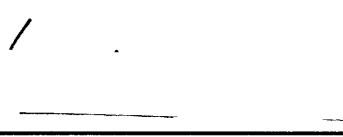
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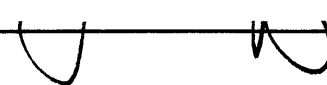
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Rethinking New Delhi :
Design Studies on the densification of a colonial city

Nandinee Phookan

Submitted to the Department of Architecture on May 8, 1987 in partial fulfillment of the requirements for the Degree of Master of Science in Architecture Studies.

Abstract

New Delhi, the capital of the British Raj in India, forms with the Mughal walled city of Shahjahanabad, the core of a city that has grown tenfold in the forty years since Independence, from 700,000 in 1947, to 7.5 million today. Tremendous disparities characterize this core comprising of what was the 'native city' and the 'colonial city'. The foremost of these is that of density, which is about 350 persons per acre in Shahjahanabad compared to 20 to 25 persons per acre in colonial Delhi.

This thesis questions the validity of this bipolarity and the continued existence of a suburban environment in the heart of the city through a series of design studies on the densification of the colonial city. It deals with urban form and its implications. While the stated goal of the Master Plan has been to achieve a more equitable distribution of densities in this core, the reasons for densification, who it is to benefit, and its formal expression as presented in urban design proposals for the area, are often contradictory.

The thesis demonstrates an alternative approach that attempts to address these issues within the scope of a purely formal study. It draws on precedents of urban form that already exist in the context of Delhi : that of Shahjahanabad and the colonial city which contains within its suburban environment, traces of another urban tradition.

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Contents

Intentions	5
Delhi	7
On densification	19
An Alternative Approach	29
Streets	35
Blocks	47
Building Types	56
Urban Spaces	71
Conclusions	77

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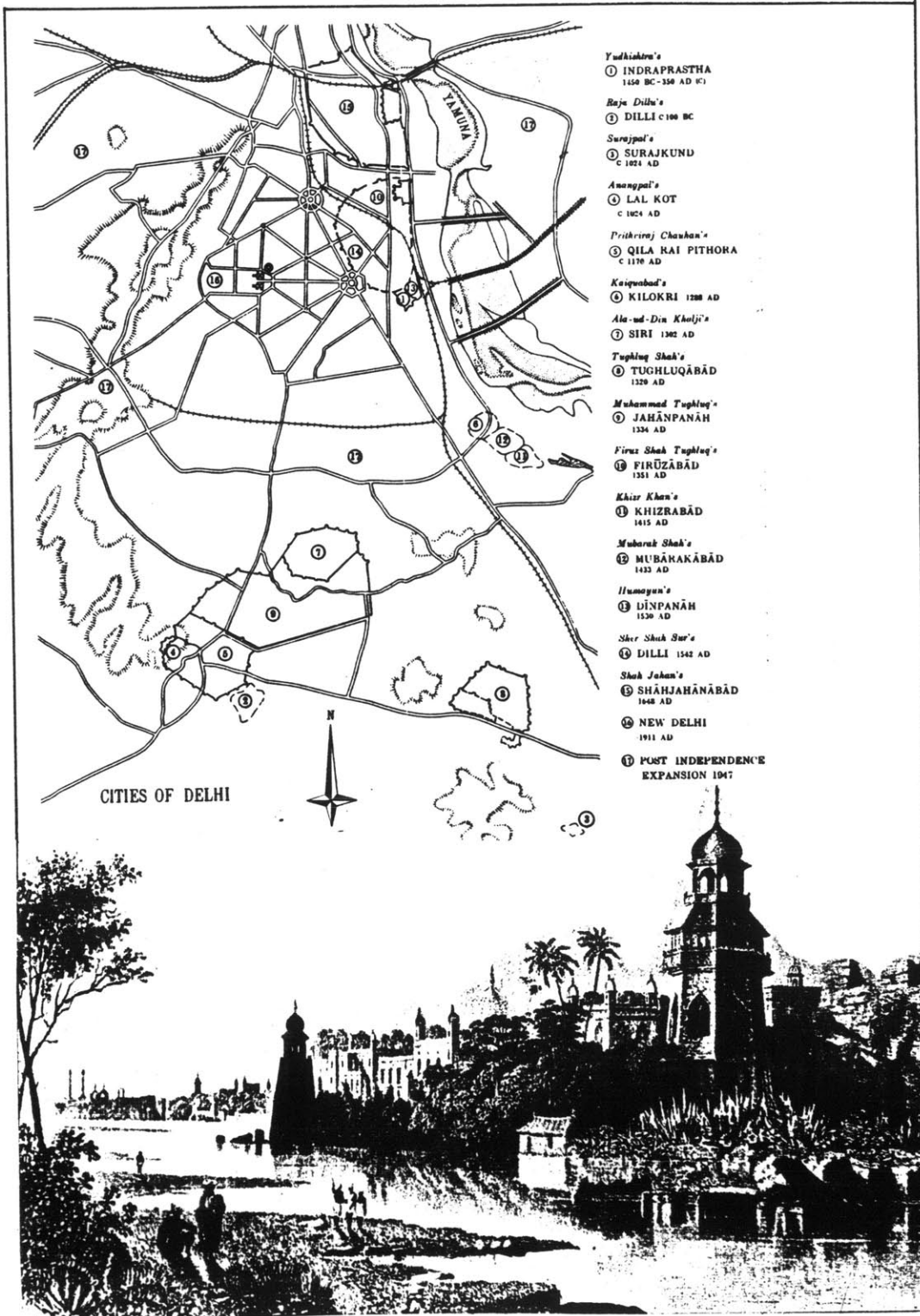
Intentions

This study started in Delhi with an interest in the contrasting nature of the old walled city and New Delhi, the colonial city. This contrast was not confined to the physical form which was totally introverted in one and totally extroverted in the other . It extended to the kind of people that lived there, the way they lived. The clue to understanding the contemporary city which is an uncomfortable mixture of the two, seemed to lie in the nature and relationship of these two cities.

This led to an interest in colonialism, its impact on existing indigenous settlements, the relationship between social, economic and political factors and built form in the colonial city and the extent to which its influence continues in contemporary Indian society.

The initial intention was to study to what extent, what Anthony King calls 'cultural colonialism' in his book 'Colonial Urban Development', still exists and secondly to what extent it is reflected in the built form of the contemporary city. This would have to be based on extended field studies and remains a project for the future.

This thesis deals exclusively with built form. It accepts that changes introduced during the colonial period as reflected in contemporary development, are irreversible to some degree. But the contemporary city is an expression of changes in lifestyle as well as policies codified in legislation and imposed from above. These design studies question the assumptions underlying such policy and the values implied in their attitude towards the walled city and New Delhi.



Delhi

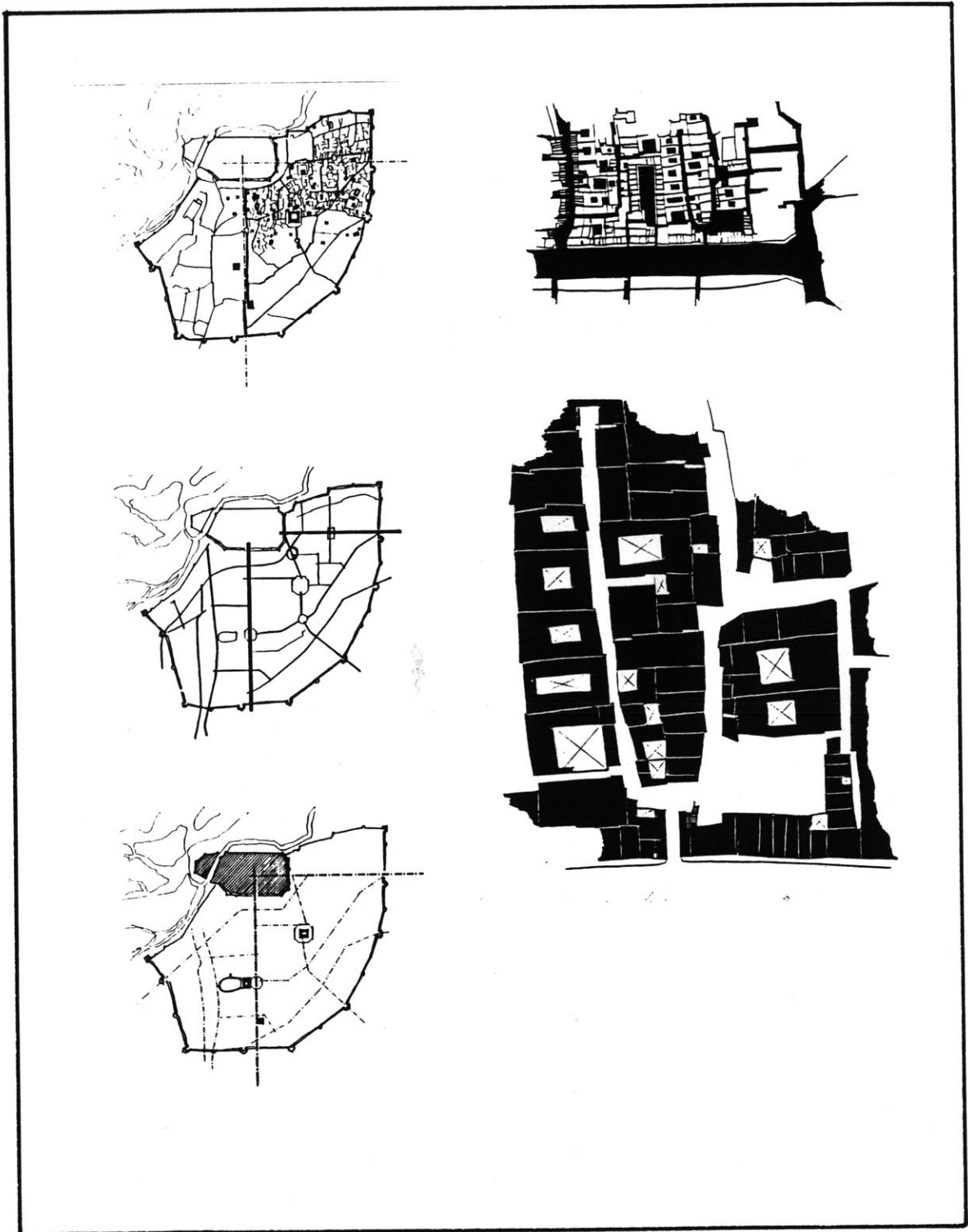
When the British left India in 1947, they left behind them the greatest showpiece of the Raj : New Delhi. Designed by Edwin Lutyens and Herbert Baker, it was the ultimate expression of the colonial city as it had evolved over the years. The decision to move the capital of colonial India from Calcutta to Delhi in 1911 was not surprising, given the history of India and Delhi's role in it. Every emperor wanted Delhi in the implicit belief that the key to the control of India was the control of Delhi.

The first city of Delhi , going back to 1500 B.C., is believed to be Indraprastha, capital of the Pandavas, on whose lives the epic *Mahabharata* is based. This was followed by a succession of cities founded by both Hindu and Islamic dynasties, each serving as a quarry for the next. There were at least seven, perhaps seventeen, Delhis of varying size and importance within an area of about six by twelve miles. Many of these cities disappeared without a trace. The ruins of many others lie scattered, a tomb or a fragment of a wall that punctuates the brick and concrete city of today.

Cities of Delhi

What existed in the form of a living city when the British first occupied Delhi in 1803 was the Mughal city of Shahjahanabad. Founded around 1638-48 by Shahjahan, it was the last stronghold of the Mughals and already in decline. The city had grown around the Jama Masjid or Friday Mosque, situated at its highest point on a rocky outcrop, forming with the fortified royal palace of red sandstone, the Lal Quila, one of the two foci of the city. The orientation of the Jama Masjid in the direction of Mecca, formed the basis for the orientation of the entire city, covering an area of about two and a half square miles north of

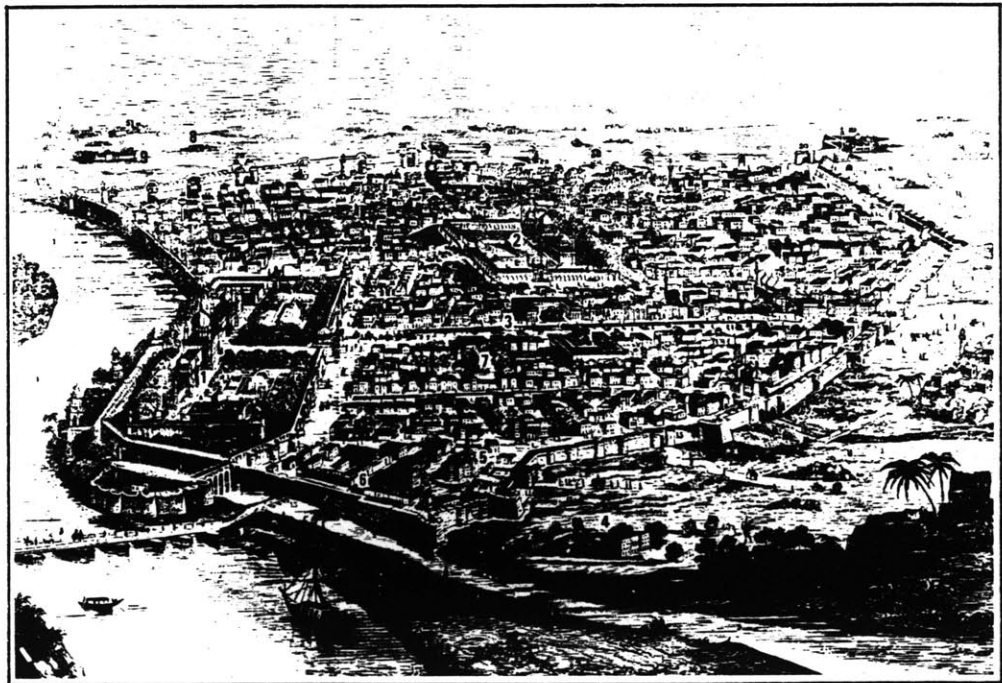
Shahjahanabad



Indraprastha, between the river Yamuna on the east and the ridge on the west. The Lal Quila was situated on the banks of the Yamuna, with the main commercial axis of the city, Chandni Chowk, running east-west between the palace and a smaller mosque, the Fatehpuri Masjid. A secondary commercial street, Faiz Bazaar, ran north-south. Hospitals, caravanserais and a public garden were located along the Chandni Chowk. The city wall was added around 1657, defining its limits. It was punctured by gates named after important places in each direction. On the west for example, beyond the Fatehpuri Masjid and off the main axis of the Chandni Chowk was the Lahori Gate, while on the south leading to the older cities of Delhi was the Dilli Gate.

The planned part of the city was confined to these principal organizing elements. The rest of the city grew organically within the structure defined by them, around the neighbourhood unit of the 'mohalla', a predominantly residential area with a population of about 1000 to 1500. These neighbourhood units developed around a common approach road or a group of 'havelis', which were palatial residences. As the city grew within the confines of its walls, land was sub-divided and the spaces between these large houses were gradually filled in by smaller houses, giving it its dense, built-up, urban fabric. The mohalla was thus defined by its core and not by its boundaries, which were often nebulous. A typical feature was the 'chowk' or small square formed where smaller lanes met the main street of the mohalla or at the end of a street, serving as common meeting grounds for the local community. The mohalla evolved into a highly complex and coherent entity with a hierarchy of spaces defining the gradual and subtle transition from public through semi-private to private, characterized by a lack of segregation in

- 1 'Palace and Gardens'
- 2 'The Jumma Masjid'
- 3 'Main Street of Delhi, Chandni Chauk'
- 4 'Custom House'
- 5 'English Church'
- 6 'Magazine and Store Houses'
- 7 'The Banking-house'
- 8 'Gaol'
- 9 'Lunatic Asylum'

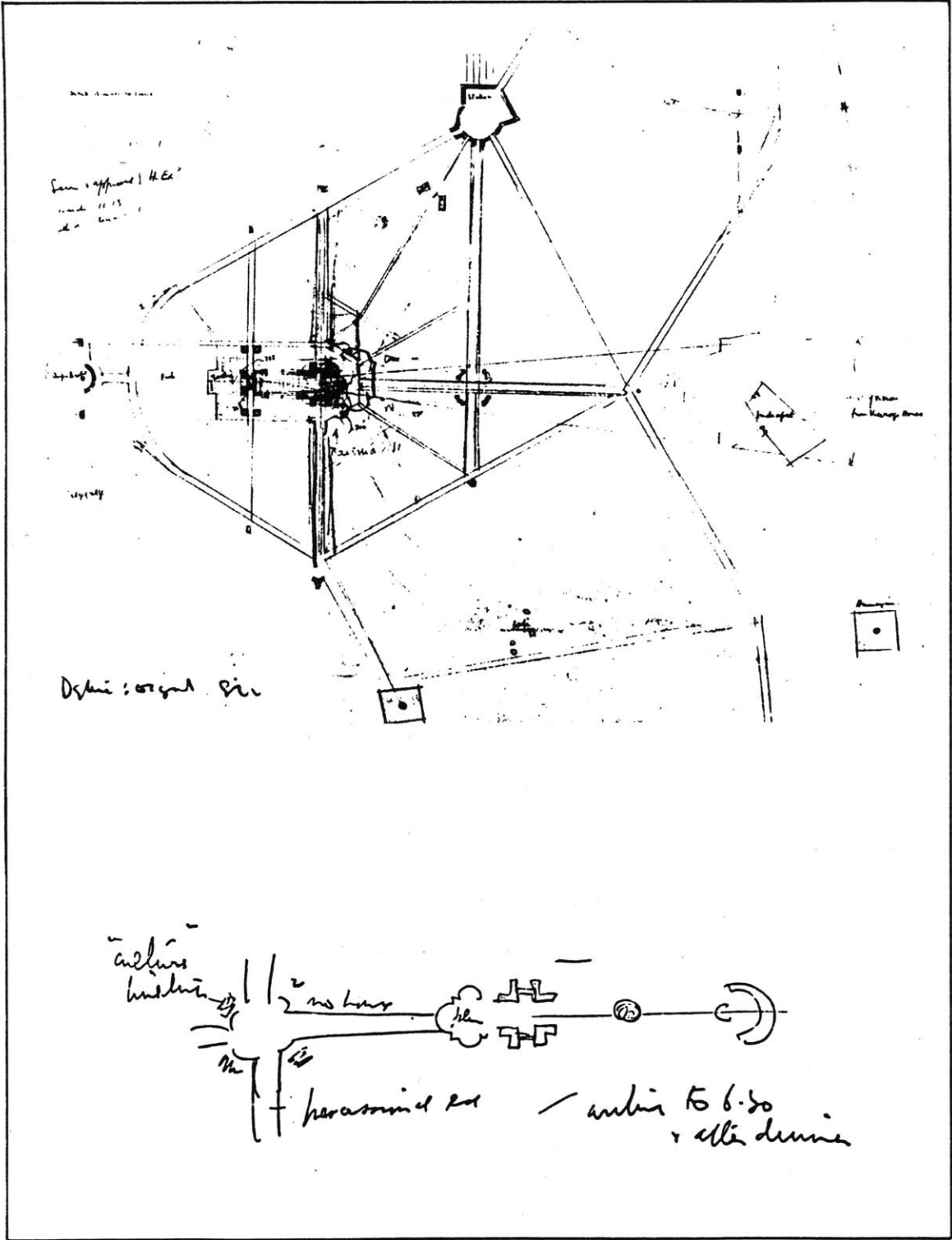


terms of use as well as economic class. The whole city was arranged around the typological feature of the courtyard which formed the central element in the Jama Masjid, the palace complex, as well as residences of both rich and poor. The commercial expression of the courtyard typology was the 'katra', which was a market around a large courtyard, specializing in the sale of a single commodity with residential spaces above.

By the time the British entered Delhi, Shahjahanabad, once the capital of the Mughal empire, was the total extent of Mughal rule in India. With the British occupation this was reduced to the Lal Quila and some two square miles in its immediate vicinity.

Between 1803 and 1857, British troops and civilians lived within the walled city, occupying areas immediately to the north and south of the palace along the Jamuna. Changes to the city were minimal and confined to the areas occupied by the British. 1857 was the year of the Sepoy Mutiny brought about when the British Army unwittingly introduced greased cartridges smeared with cows' and pigs' fat, sacrilegious to both Hindus and Muslims. The massacre of the British was followed by the massacre of Indians. Drastic modifications to the walled city followed. British troops occupied the palace and an area constituting about a third of the entire area of the city on the east. The built-up area between the Lal Quila and Jama Masjid was cleared. A security zone, 500yards wide, was demarcated all around the city walls where building was prohibited and agriculture restricted. Displaced Indian families moved into the western, Indian part of the city, resulting in over-crowding. The European population moved out to an area north of the walled city . A gradual move out of the confines of the walled city had started earlier, but after the Mutiny, for the

Colonial Interventions



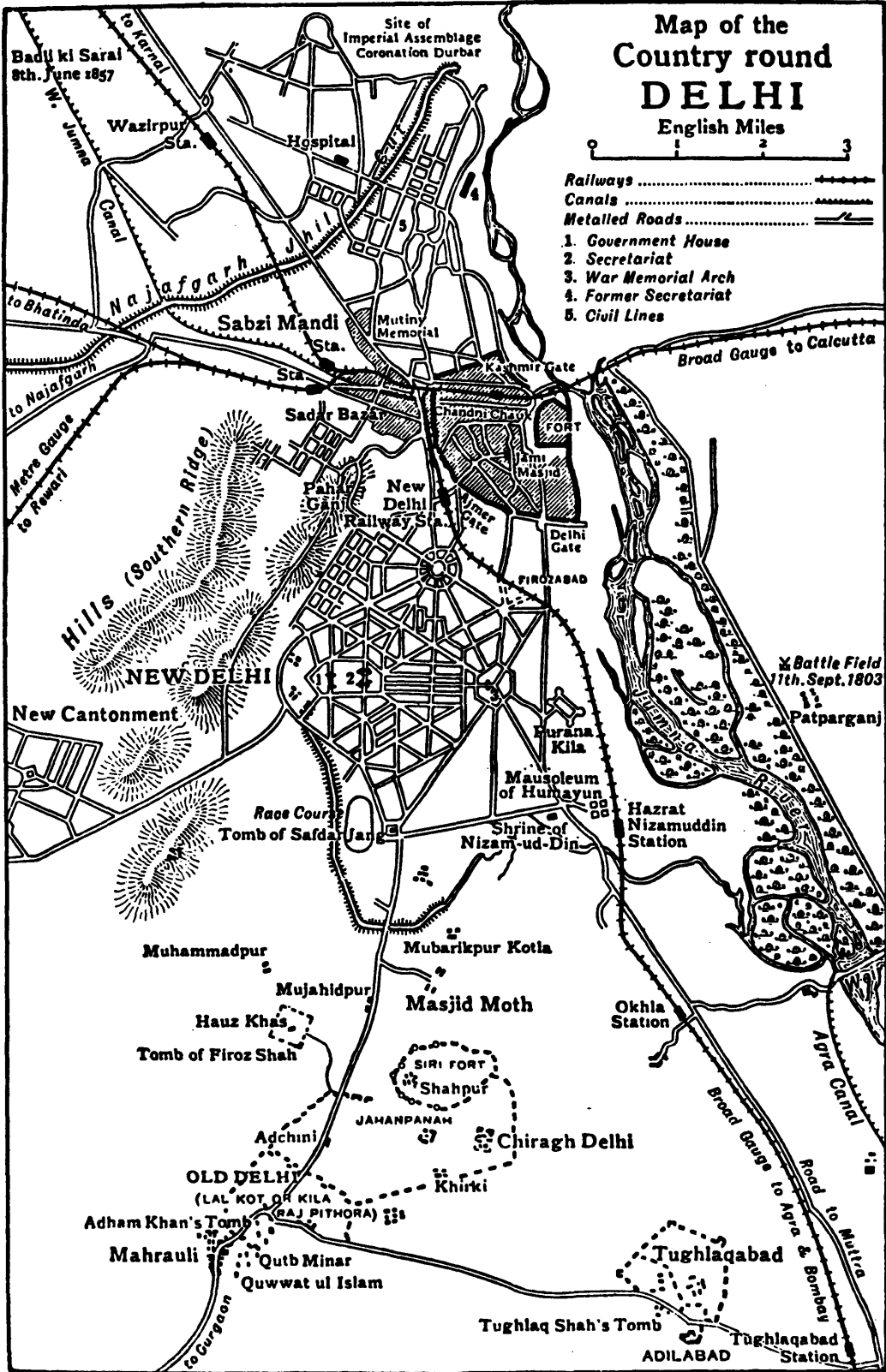
first time the twin colonial settlement areas of the Cantonment and Civil Station become consolidated as a separate culturally modified environment for the exclusive use of the colonial community.

By 1911, the security zone to the west of the walled city was given over to railway lines; on the east there was first the river, then the fort and finally a stretch occupied by the armed forces; to the north the railways, an European sector, the city wall, gardens, a police station and a cemetery separated the colonial and Indian population of Delhi. With the building of New Delhi, the last open side on the south was also to be blocked.

As in the existing colonial settlement to the north of the walled city, the two major components of New Delhi were a civil station and a cantonment. To quote Anthony King, "Conforming to earlier colonial urban models, the civilians lived outside and away from the 'native town', with the ultimate source of power, armed force, located slightly to their rear". The most prominent natural feature on the site, Raisina Hill, was selected for the location of Government House, the residence of the Viceroy. The principal axis of the city leading up to Government House was originally aligned towards the Jama Masjid in Shahjahanabad, but this would have meant cutting through the existing suburb of Paharganj which proved too uneconomical. Although there were no direct links between the two cities, a subsidiary street retained this alignment and the hexagonal layout of New Delhi was the result of the decision to align major roads leading to Government House towards existing monuments in the city.

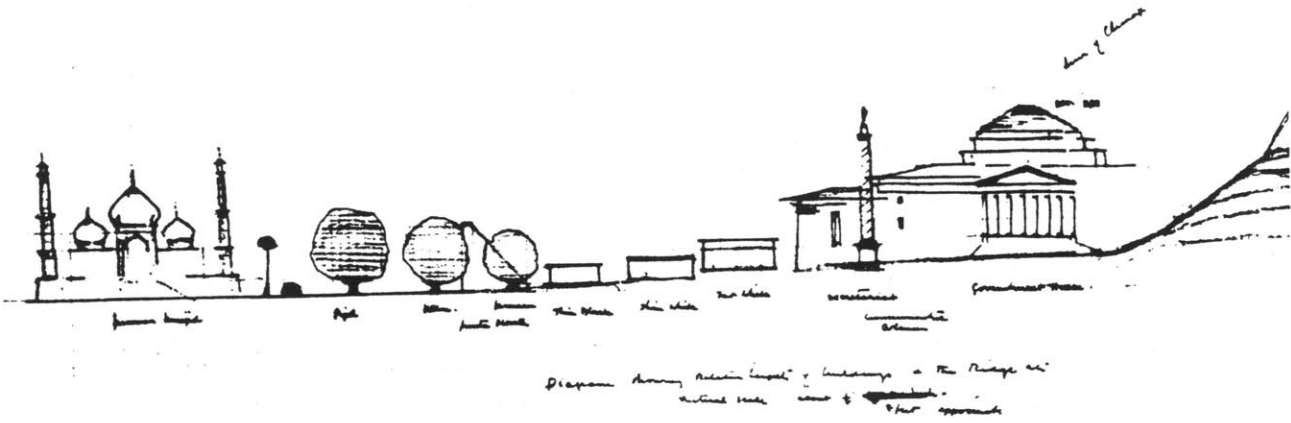
New Delhi

As it was finally built, Kingsway, the central parkway, was



aligned towards the Purana Quila , on the site of Indraprastha, the oldest city of Delhi. Its line of climax terminated at Government House on Raisina which was now preceded by a court with two Secretariat blocks on either side. The parkway itself terminated in a great forecourt before the ascension into Raisina from which six more roads radiated. At the east end, the Central Vista or Kingsway terminated in a hexagon called Princes Place around which were the residences of Indian Princes, on which another six roads converged. To the west of the hexagon, spanning Kingsway was the All India War Memorial Arch. Intersecting Kingsway at right angles was a secondary axis, Queensway, running north-south with a new railway station and a commercial center, Connaught Place, on the north. At the intersection of the two axes, were four large buildings : the Oriental Institute, National Museum, National Library and Imperial Record Office. At the eastern end of the Central Vista an irrigation reservoir was planned to act as an artificial lake reflecting the walls of the Purana Quila but finally a stadium was constructed in front of it blocking any view of the old fort.

Around the Central Vista were the residential areas housing the employees of the Colonial Government. According to King, "The status of any particular accommodation was communicated by one or more of ten indicators : elevation, distance from Government House, size of compound, size of dwelling, width of road, name of road, name of area, number and index of house type (e.g. 'Block 4, 1E'), type and quantity of vegetation and the presence or absence of various facilities". Senior officials were housed in large bungalows with servants' quarters on two to four acre lots south of the Central Vista. Junior officials got smaller bungalows to the north, followed by



European and Indian clerks in decreasing sizes of dwellings at increasing distance from Government House. A pencil sketch by Lutyens showing the 'line of climax' with 'thin blacks' or Indian clerks followed by 'thin whites' or European clerks and 'fat whites' or senior European officials in an increasing gradient culminating in Government House, illustrates clearly the degree of segregation in terms of race as well as class.

Although the Civil Station to the north of the old city anticipated the urban model adopted for New Delhi, it had grown over time in a more or less haphazard way, while New Delhi concretized into physical form its abstract underlying social structure in a highly conscious way. According to Anthony King, "It expressed total control over the environment, with the power to define boundaries and order the spaces within them; it represented total control over the social structure, the power to order precedence, create communities and control social relations between them. Third, it expressed total control over the process of allocation; once the places were created they would be filled according to plan".

The impact of New Delhi on the old walled city of Shahjahanabad was indirect rather than direct. By 1931, in an area of 33 square miles, the population of New Delhi was 65,000 while the old city had a population of 350,000 in an area of roughly 7 square miles. New Delhi was designed for a ruling elite with motorised transport and the level of infrastructure and its low density assumed a highly inequitable distribution of resources between the two cities. The high level of investment required to maintain the new capital meant a correspondingly lower level of investment in the old city.

The BI-polar Core

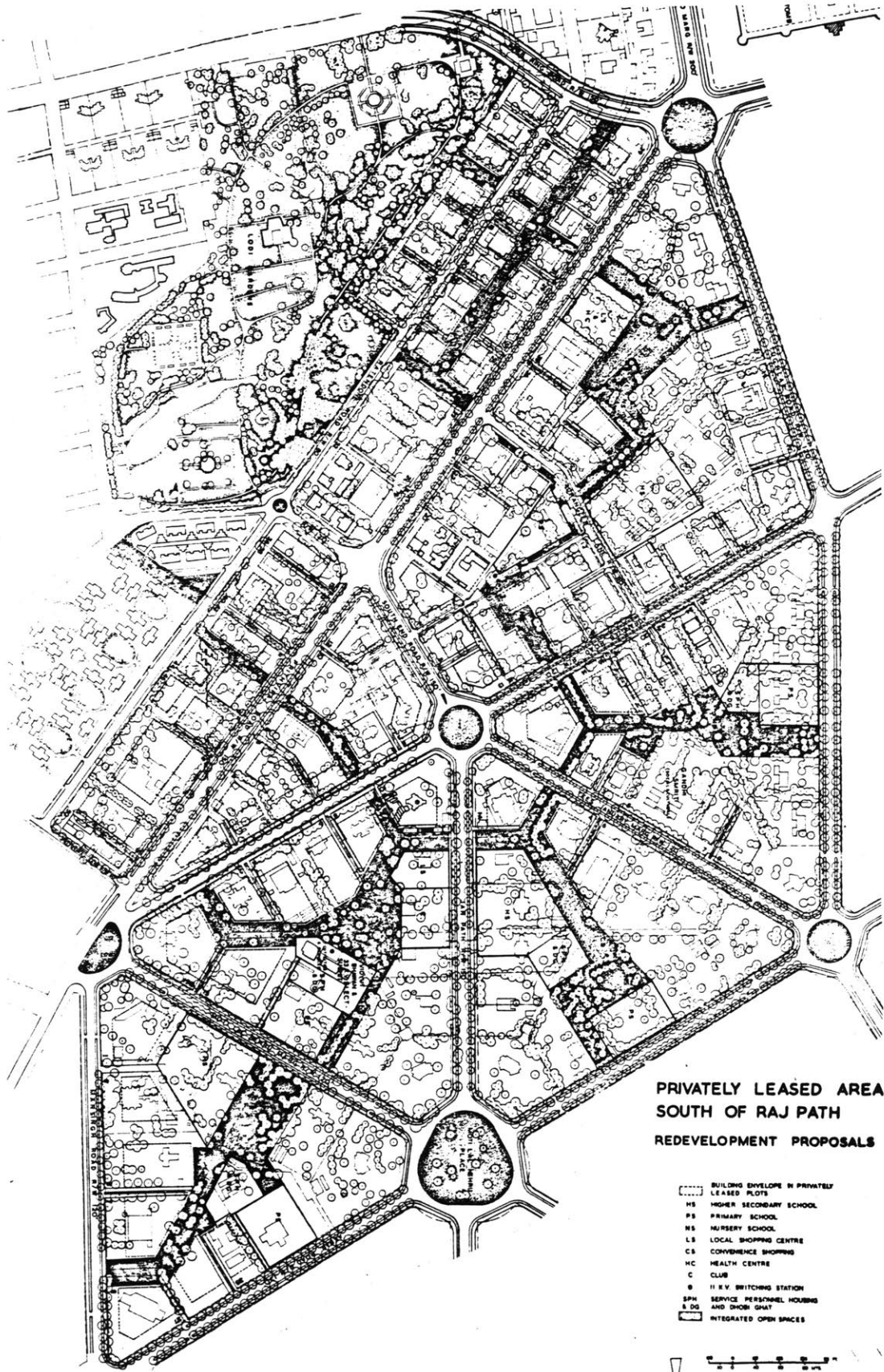
With independence and the partition of India and Pakistan, the population of Delhi increased from 700,000 to over 1.4 million between 1947 and 1952. Today it is about 7.5 million and according to the Master Plan, by the year 2000, Delhi will have a population of 12.2 million. Yet, at its core, the disparities between Lutyens' Delhi and Shahjahanabad continue to exist. This phenomenon of the bi-polar core comprising of what was known during colonial times as the 'native city' and the 'colonial city', the one seemingly irrational, overcrowded, dirty, while the other, with its wide tree-lined avenues and stately bungalows, rational, clean and orderly, is common to many ex-colonial cities. Around this core lies the endless sprawl of post-independence development with its violent juxtaposition of old and new, rich and poor, order and chaos, the built expression of a colonized culture in search of its own identity.

On Densification

The bipolar core of Delhi can be seen as the quintessential expression of the schizophrenia that pervades most contemporary development. Today the old city is bursting at the seams, industry and commerce vying with a large proportion of Delhi's migrant population for its limited space at a gross density of 350 persons per acre. The colonial city remains more or less in its pristine state, an enclave of the rich and powerful, the 'indigenous' elite that inherited and continues to perpetuate much of the policies and institutions of the colonial government. What was Viceroy's House is today known as Rashtrapati Bhavan, the residence of the President of India; Kingsway, the ceremonial route with its triumphal arch, designed to display the power of the colonial government over the colonized population, serves much the same purpose for the government of independent India, although the crowds that gather there on summer evenings, have, to a large extent, made the wide green expanses of the Central Vista their own, its canals occasionally being used for bathing. The northern part of the city around Connaught Place succumbed to market forces fairly early and high-rise blocks loom over the circus. For the rest, Kingsway has become Rajpath and Queensway is called Janpath but the bungalows on their 2 to 4 acre compounds continue to exist in the heart of the city at densities of 20 to 25 persons per acre.

The problems of this core, especially the difference in densities have not gone unrecognized. The first Master Plan for Delhi, 1962, states, "It is of the utmost importance that physical plans should avoid stratification on income or occupation basis.....a more rational distribution of densities has been proposed by a gradual thinning of the density in the Old

The Master Plan



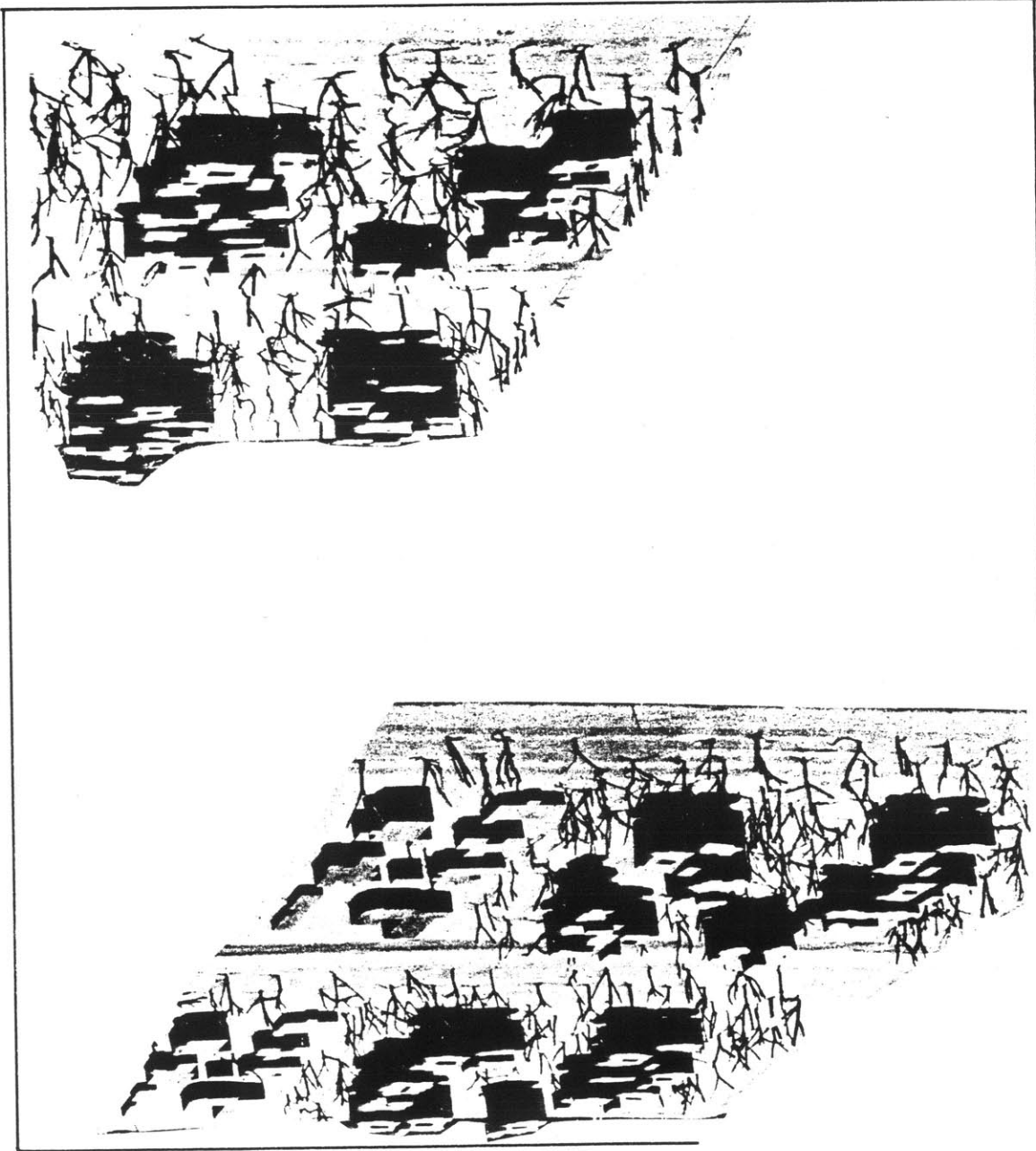
City and by increasing the density in New Delhi.....". While recommending a reduced density of 250 per acre for the Old City, it proposed to raise the density in the bungalow area south of Central Vista in New Delhi to 75 per acre "by the judicious planning of some high-rise apartment houses".

Implementation, however, has been a slow process. In 1971 the New Delhi Redevelopment Advisory Committee was formed to prepare detailed urban design proposals for various areas of New Delhi including the residential area south of Rajpath or the Central Vista, which consists of wide tree-lined avenues and large bungalows with six to seven servants' quarters, originally designed for senior officials of the British Raj. Part of this area is privately leased while the rest of it consists of bungalows occupied by senior officials of the Indian government.

Design Proposals

The recommendations of this committee center around the preservation of the suburban character of the area by preserving all trees along the avenues as well as within lots. This was sought to be achieved by means of 'building envelopes' determined by the position of trees in each lot instead of the standard setbacks of 50 feet in front, 20 feet on either side and 30 feet in the rear, recommended in earlier plans.

Secondly a system of 'integrated open spaces' was introduced by running a continuous green strip through the interior of each superblock. This was done by eliminating existing servants' quarters and service lanes and pooling together the open space at the rear of each lot. Around each superblock, in place of the compound walls that demarcate individual lots, a 3



feet high steel railing of standard design was seen as a further aid to integration.

Within the building envelopes, four storey walk-up apartments were to be developed in the form of co-operative group housing as recommended in the Master Plan for lots larger than an acre. In this form of development, land is owned collectively with individual ownership of apartments. While planning for a gross density of 75 persons per acre as recommended in the Master Plan, a maximum ground coverage of 25% with a floor area ratio of 60 was proposed. This was seen to provide flexibility in layout as well as variation in height with the possibility of a stilted ground floor for parking, which was seen to be advantageous.

Dwelling units found 'most suitable' for the area were three bedroom apartments with attached servants quarters of average sizes ranging from 1700 to 1800 sq. ft.. The maximum size of apartments was fixed at 2000 sq. ft. so as to discourage 'luxury housing'.

Clearly, the intention here is not to create an urban environment but to nominally densify suburbia. Nor is it meant to absorb the excess population of the Old City in order to achieve a more equitable distribution. Overcrowding in the Old City is **not** a result of the well to do clamouring to get a piece of it and, like it or not, 1700 to 1800 square feet in the middle of New Delhi is luxury housing.

Implications

There are various reasons, apart from the disparities that exist between the Old City and New Delhi, why densification is desirable. Within the existing pattern, established in the

colonial city and continued in post-independence development, the rich live in the center of the city while the poor, dependent on an inadequate public transport system, are forced to commute over large distances to the center of the city. This was the brunt of criticism even during the planning of New Delhi, at the time of the British Raj. To quote one reporter, "Would it not be kinder to put the senior and richer men who can afford plenteous petrol and tyres on the outskirts, while their subordinates walk to work?". As the use of public transport in the last 9 km to the work areas in the center of the city is minimal, there is an unnecessary waste of energy. Service networks for water supply, sewerage and drainage, inadequate in most other parts of the city, are grossly underutilized. With a rapidly increasing population, there is increasing pressure on land and the need to use this piece of prime real estate in the middle of the city, largely under government ownership, more effectively.

Obviously it is those belonging to lower income groups, without the benefit of personal transport, who would gain the most from this location. Even if it is considered unrealistic to develop this area exclusively for the poor given its high market value, to exclude them completely by developing it in the form of three bedroom apartments, 1700 to 1800 sq. ft. in area, where each family is expected to own one car, is to negate completely the objectives stated in the Master Plan. As pointed out by J.C.Gambhir, Director of Perspective Planning at the Delhi Development Authority, in a paper presented at a seminar on 'The Future of New Delhi', the net density in this area excluding servants' quarters is less than 1 dwelling unit per acre, while including them it is about 7 d.u.s per acre. To quote, "Obviously in the status city of New Delhi there is a higher

population of low income group and by the law of averages it would be a city of the poor". One could argue that at least the present mix of income groups should be maintained but to propose a 'servant's room' attached to each apartment, owned by the owner of the apartment, is just one way of giving away an extra room.

The Urban Land Ceiling Regulation Act of 1976 introduced some changes to the proposals of the NDRAC and higher densities were prescribed for surplus land above the ceiling limit, with dwelling sizes of 600 to 1000 sq. ft. of which 1/3 were to be of 600sq. ft. These were to be on ownership basis for low and middle income families and the government was to oversee the sale of apartments to ensure that the social objectives were met. However, even these smaller apartments would be unaffordable at market rates by the families they were meant for. Surprisingly, no form of cross-subsidy is made use of and prime government land along major avenues is thrown away on schools and health centers which are unlikely to bring the government any financial returns.

In terms of urban form, the question is, what is appropriate and can it be achieved simply by saving every tree in the area ? There is no dirt of precedent in the cities of India. One only has to look as far as Shahjahanabad, which for all its narrow, twisted streets and pedestrian scale, has a highly coherent urban structure within which the interplay of streets and squares, the neighbourhood unit of the mohalla and the transition from public through semi-public and private spaces form a clearly defined pattern. Even if this is considered irrelevant today, especially in the context of New Delhi, one only has to remember some of the criticism leveled at Lutyens'

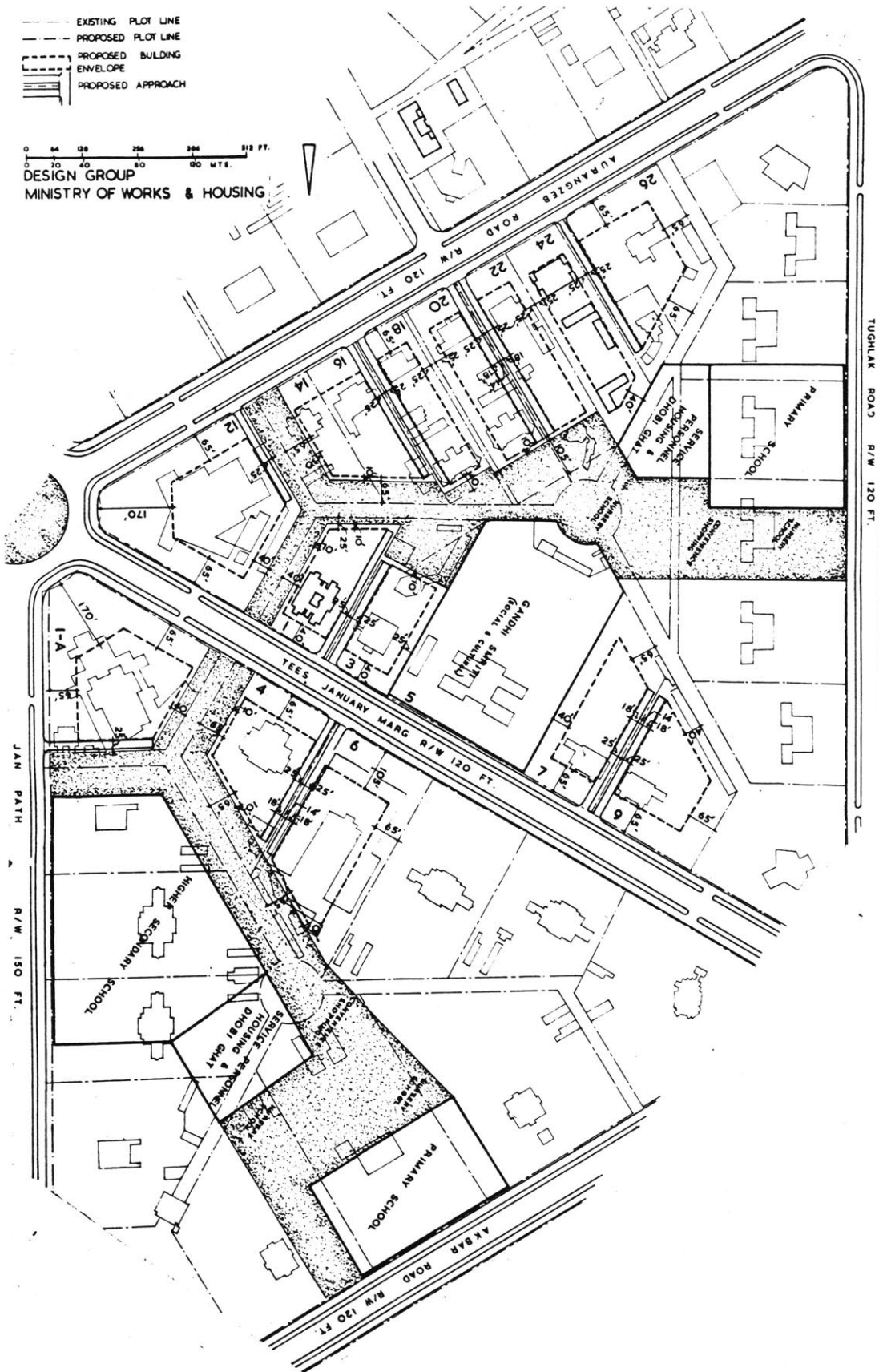
Urban form

Delhi at its inception. To quote the critic Thomas Sharp, "Little dwellings crouching separately under trees on either side of a great space - how can they look other than mean and contemptible ?" According to him, "We want something to reflect our achievement, our great over-topping of nature : something that is a worthy symbol of civilization, of society, of broad expanding sympathies, of science, art and culture. That we can only get through pure medium, the town. Town-country, garden-city will never give it. Only sheer, triumphant, unadulterated urbanity will". Even Hardinge, then Viceroy to India, felt that the wide tree-lined avenues would only be attractive with five-storied buildings on either side like those in the "Champs Elysees or Bombay".

Trees are a positive asset in this area and the large trees along the avenues are definitely worth preserving but does this have to extend to the preservation of every tree within individual lots, many of which can be replaced if other criteria that have traditionally determined urban form like the character of streets or the creation of urban space are admitted ? For example, in Shahjahanabad, society was ordered around the institution of religion and the court of the Mughal emperor, which formed the two focal elements in its built environment. These were tied together by the souk or bazar, characteristic of every Islamic city. Its physical form expressed clearly what was important to that society. Similarly, in New Delhi the role of the Viceroy and the machinery of government in colonial India are immediately legible, but more than that, New Delhi has endured because it acknowledges the presence of existing landmarks like the Purana Quila and the Jama Masjid, however superficial the gesture might have been. To the south of the Central Vista, within the area studied by the NDRAC, is the Gandhi Smriti, a

- EXISTING PLOT LINE
- - - PROPOSED PLOT LINE
- ▭ PROPOSED BUILDING ENVELOPE
- ▭ PROPOSED APPROACH

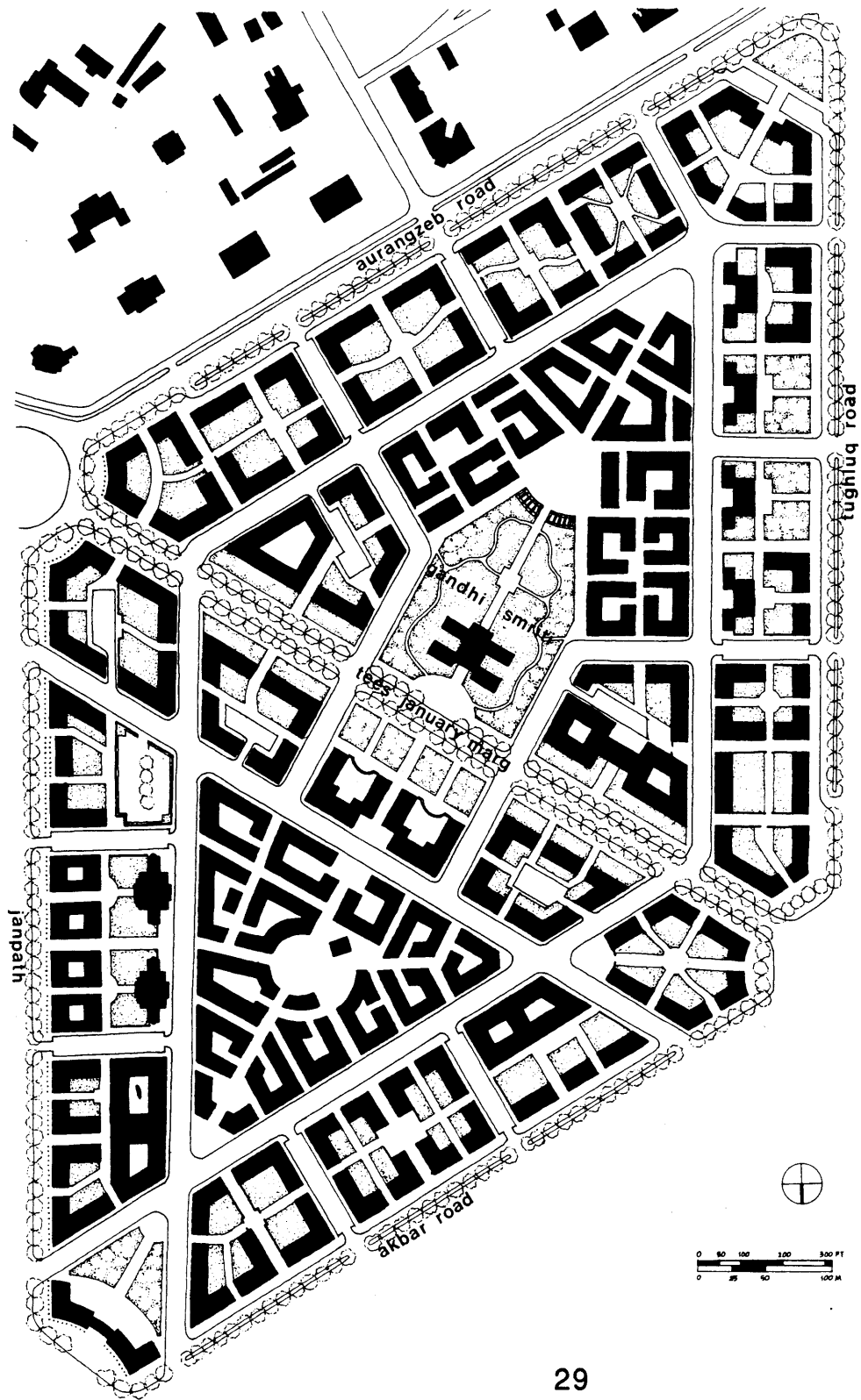
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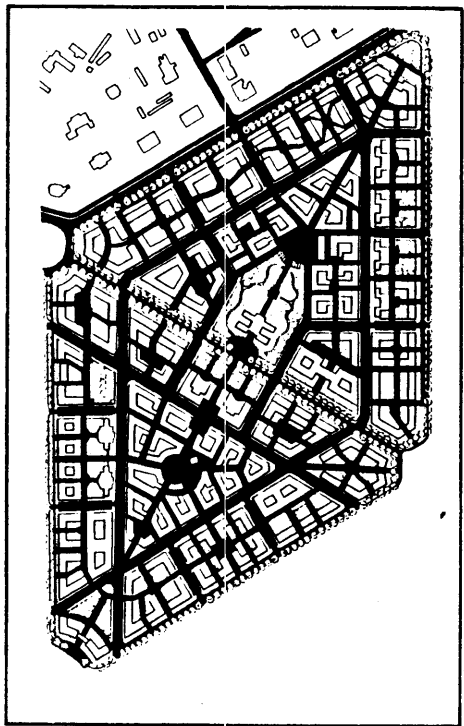
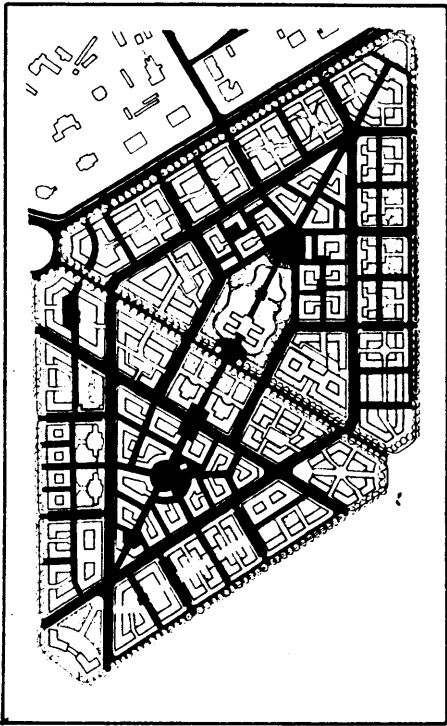
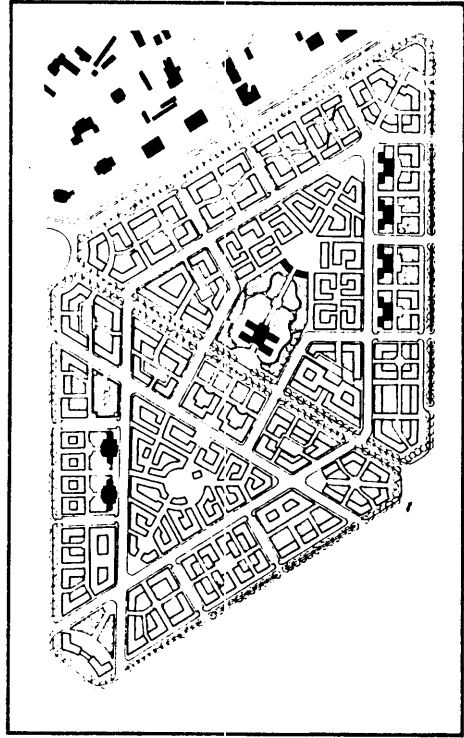
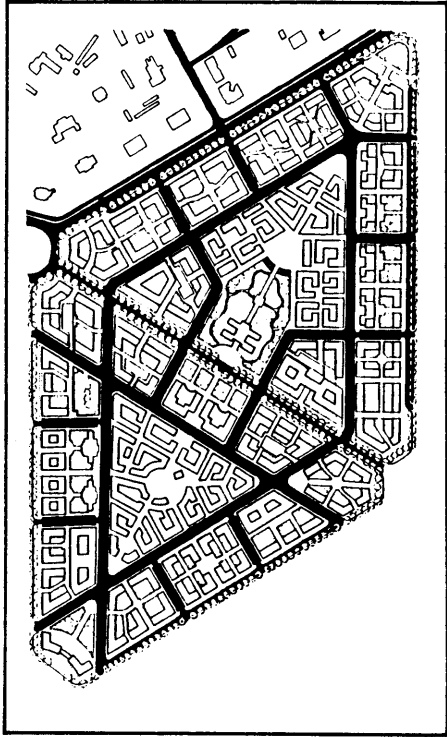


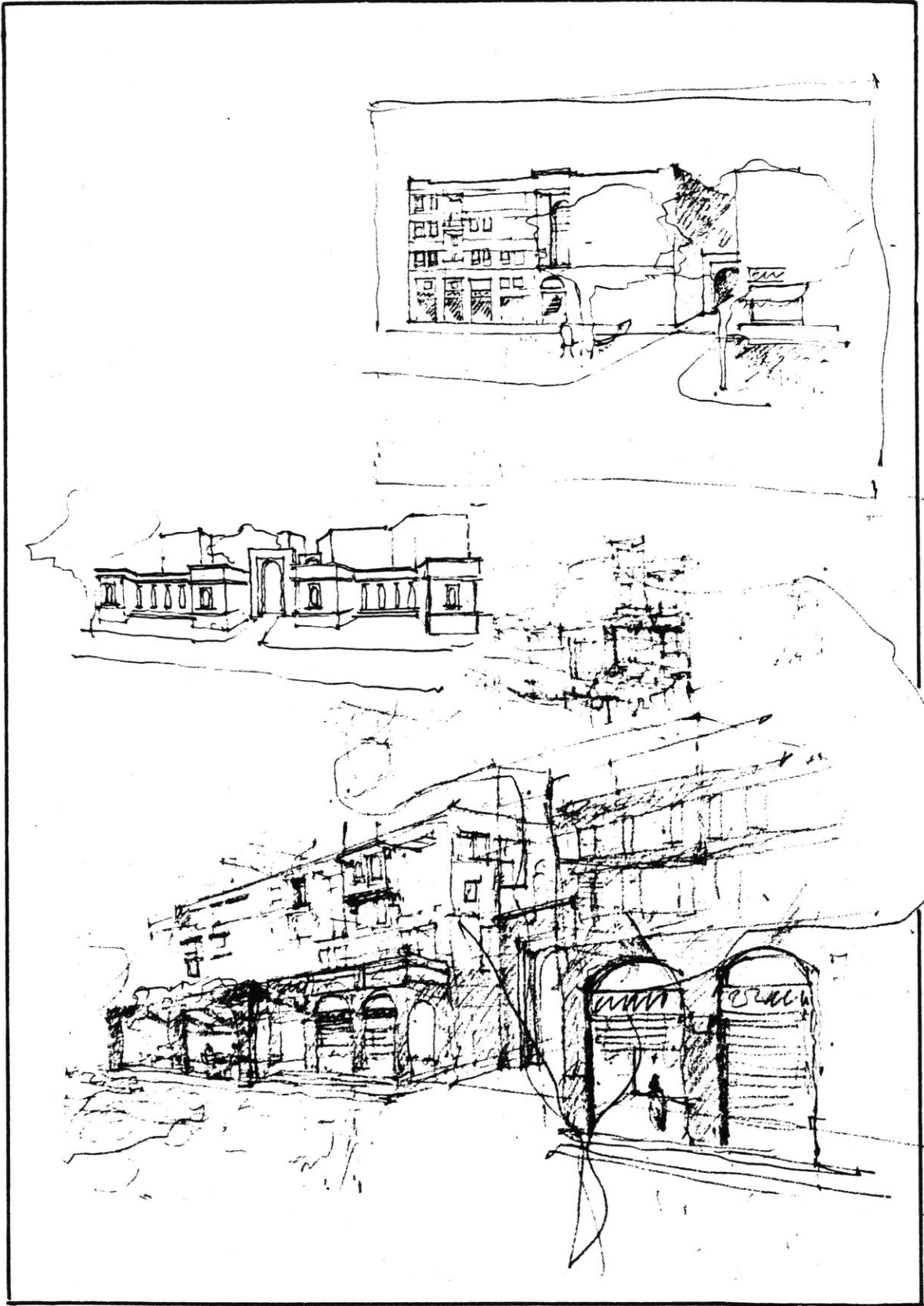
memorial to Mahatma Gandhi. This building was formerly known as Birla House, where, on his way to his morning prayers, Gandhi was shot. Does this not rank with the preservation of trees as a possible criterion in the evolution of urban form ?

The vision presented in the proposals is of large fenced in estates, 560 m to a side, within which building envelopes advance and recede with the trees. Within these building envelopes, covering 40-45% of the lot, in turn, buildings covering a maximum of 25% of the lot with a F.A.R. of 60 ,will strike out on their own, receding and advancing vertically as well as horizontally. What this vision begs is a definition of streets, of public places, of the edges between public and private, of building types, of facades and finishes. In the absence of any implicit type, can these decisions be left to individual developers of each lot without losing out on the coherence of the overall environment ? Past experience in Delhi points towards the contrary. The thought that what confronts the eye through the cover of trees may well be stilts and cars with three floors of building floating above, is enough to dissuade any tampering with the existing environment. It would be better to turn it into a large public park, punctuated, in the best English landscape tradition, with Delhi's unique brand of 'colonial follies'

An Alternative Approach







The central underlying assumption of these design studies is non-stratification in terms of income or class, which in the context of Delhi and specifically this area, implies some form of government intervention and the use of cross-subsidies. It is assumed that the intention is to achieve a more equitable distribution of densities in the core of the city which includes both Shahjahanabad and New Delhi, and that this does not mean densifying one exclusively for the higher income groups while dedensifying the other by relocating its excess population away from the core. In the past the government has provided subsidized housing for 'illegal' settlers in 'resettlement colonies' on the outskirts of the city along with a factory or workshop for the satisfaction of employment needs. Most of the houses in these resettlement colonies were sold by the intended beneficiaries who then returned to their illegal homes in the center of the city. The need is not for shelter per se, but for shelter close to centers of employment which offer a range of options.

Assumptions

Secondly, it is assumed that there will be no restrictive zoning in terms of use, and that residences, shops, offices and workshops will co-exist with cultural and educational uses within reasonable walking distances, as they have always done in traditional cities.

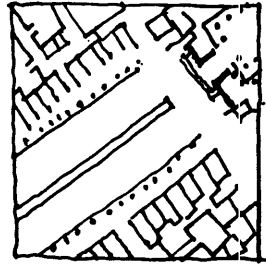
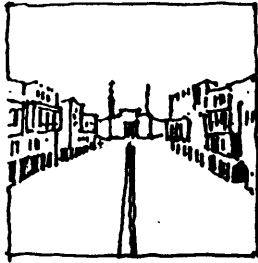
Central to the explorations of urban form is the concept of 'Type', which to quote the much used quotation from Quatremere de Quincy, ".....does not so much represent the image of something to be copied or perfectly imitated, but rather the IDEA of an element which itself serves as the rule to the MODEL : the Model in the arts is an object according to which one can conceive works which do not resemble one

Type

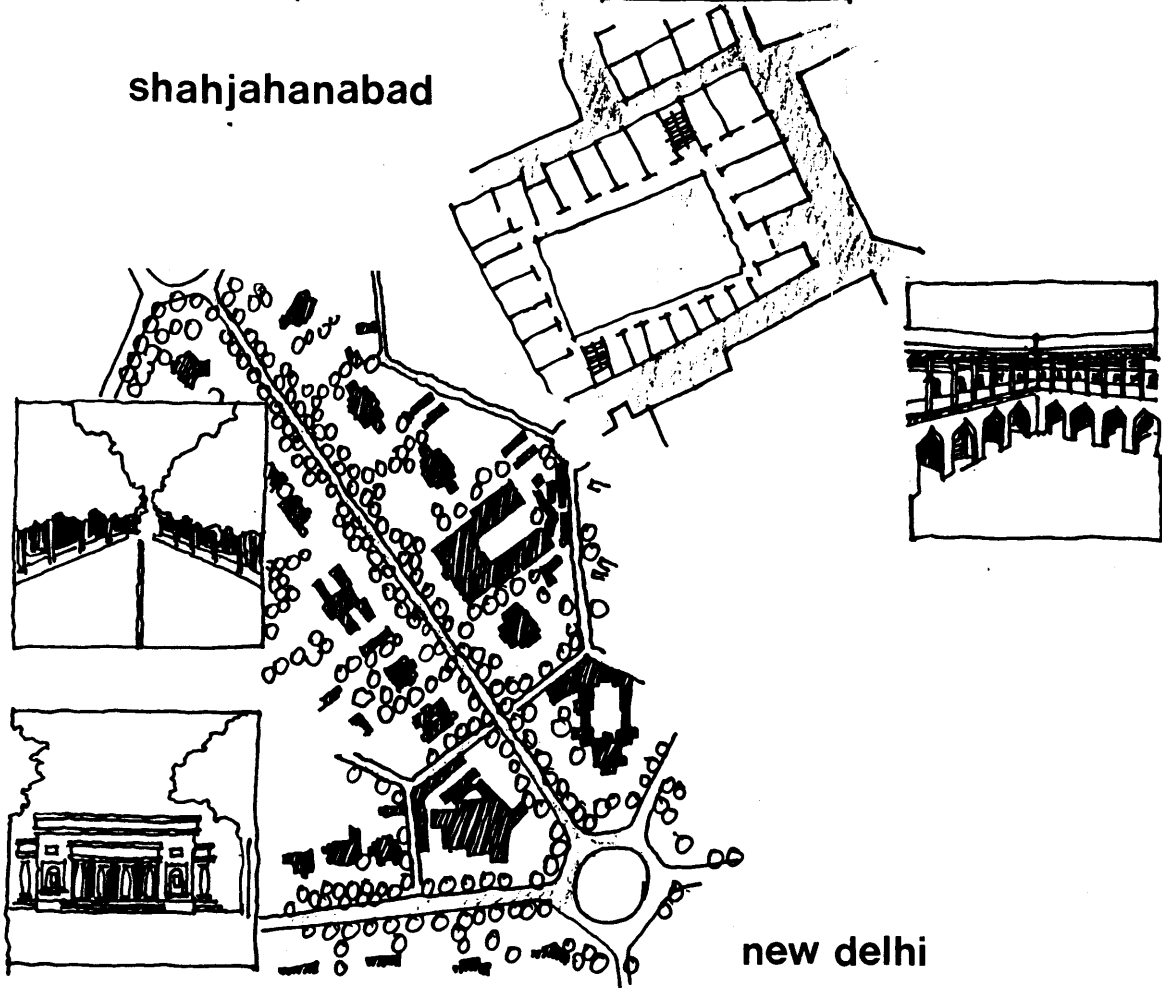
another at all. Everything is precise and given in the Model : everything is more or less vague in the Type.....". This is studied at two levels : at the level of the urban fabric in the search for a typological basis for the elements that constitute it, and at the level of the larger urban structure which acts on the fabric in response to site-specific conditions. It is based on the belief that continuity and change are the two essential and complementary aspects of the dynamic nature of the city and that all interventions must start from what is already there. In the context of Delhi this means the existing streets and blocks of New Delhi, the urban model provided by Shahjahanabad and the changes in life-style reflected in the contemporary city.

The context of these design studies is an area of about 36 hectares described by four existing avenues : Akbar Road, Aurangzeb Road, Tughluq Road and Janpath, formerly Queensway which was the secondary axis of Lutyens' Delhi running past the Central Vista to Connaught Place. A fifth avenue, Tees January Marg commemorating Mahatma Gandhi's death anniversary, cuts through the site, dividing it into two large triangular blocks, 1837 feet or 560 meters to a side. Along this avenue, almost in the center of the site is the Gandhi Smriti. The predominant image is that of wide tree-lined avenues and to a lesser degree, that of stately bungalows nestling amongst dense vegetation. The environment is distinctly suburban. What is needed to transform it into an environment that can be termed 'urban' ? More specifically, in the context of Delhi, what differentiates New Delhi from Shahjahanabad ? The images of Shahjahanabad are of people, of domes and minarets, of axes terminating on major buildings or gateways, of tortuous streets, of walls and ornate doorways. Shared elements like streets have completely different meanings in the two environments.

The Context



shahjahanabad



new delhi

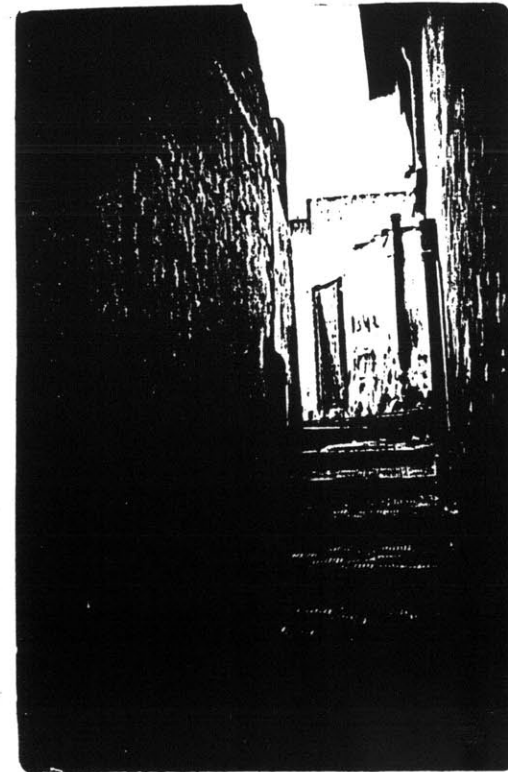
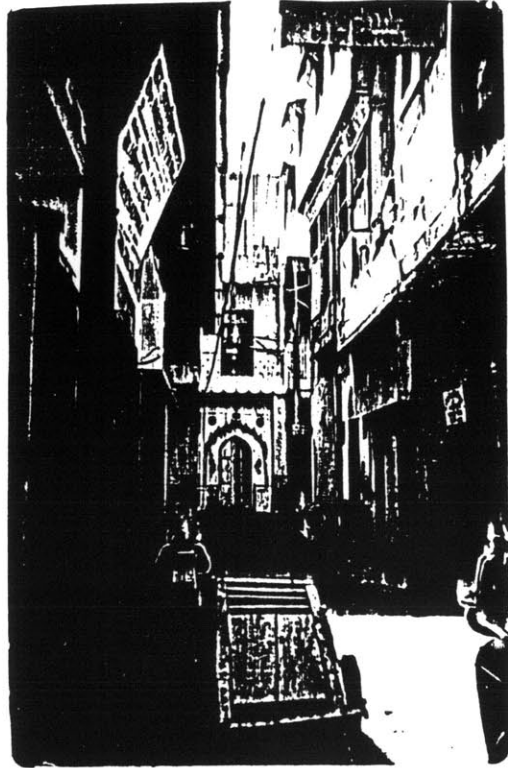
Streets

In New Delhi, the street is primarily a pleasant and efficient way of getting from one place to another and occasional strollers are assured of their solitude. One tree-lined avenue is like the other and it is impossible to locate oneself without a sign that tells one the name of the street.

In the streets of Shahjahanabad, people, cars, rikshaws and bicycles vie with one another, and movement is slow and laborious, but the street here is more than just a traffic conduit. It is a place where things happen : where people meet, street performers draw crowds and vendors flog their wares. Each street is different and their names are indicative of the specific character of a particular street. The primary axis, Chandni Chowk, means roughly, moonlit avenue. In its heyday there was a canal with fountains running through its center and trees lined its sides. 'Parathe wali gali' is a smaller street off Chandni Chowk selling a particular kind of bread. Its name means just that and the smells that greet one are all one needs to locate oneself. The mohalla street is again different. Here the street belongs to the people who use it as a playground or as a large outdoor room on special occasions like marriages.

What is operating here is an intricate hierarchy of streets. The main street is Chandni Chowk. Off this are specialized commercial streets. Gateways punctuate this higher level of streets, through which dead-end streets lead into individual neighbourhoods or mohallas. As we penetrates deeper, we encounters smaller gateways leading to narrower 'galis' or alleys, which become increasingly tortuous. These gateways mark increasing levels of privacy culminating in the intricately carved doorways of individual houses.

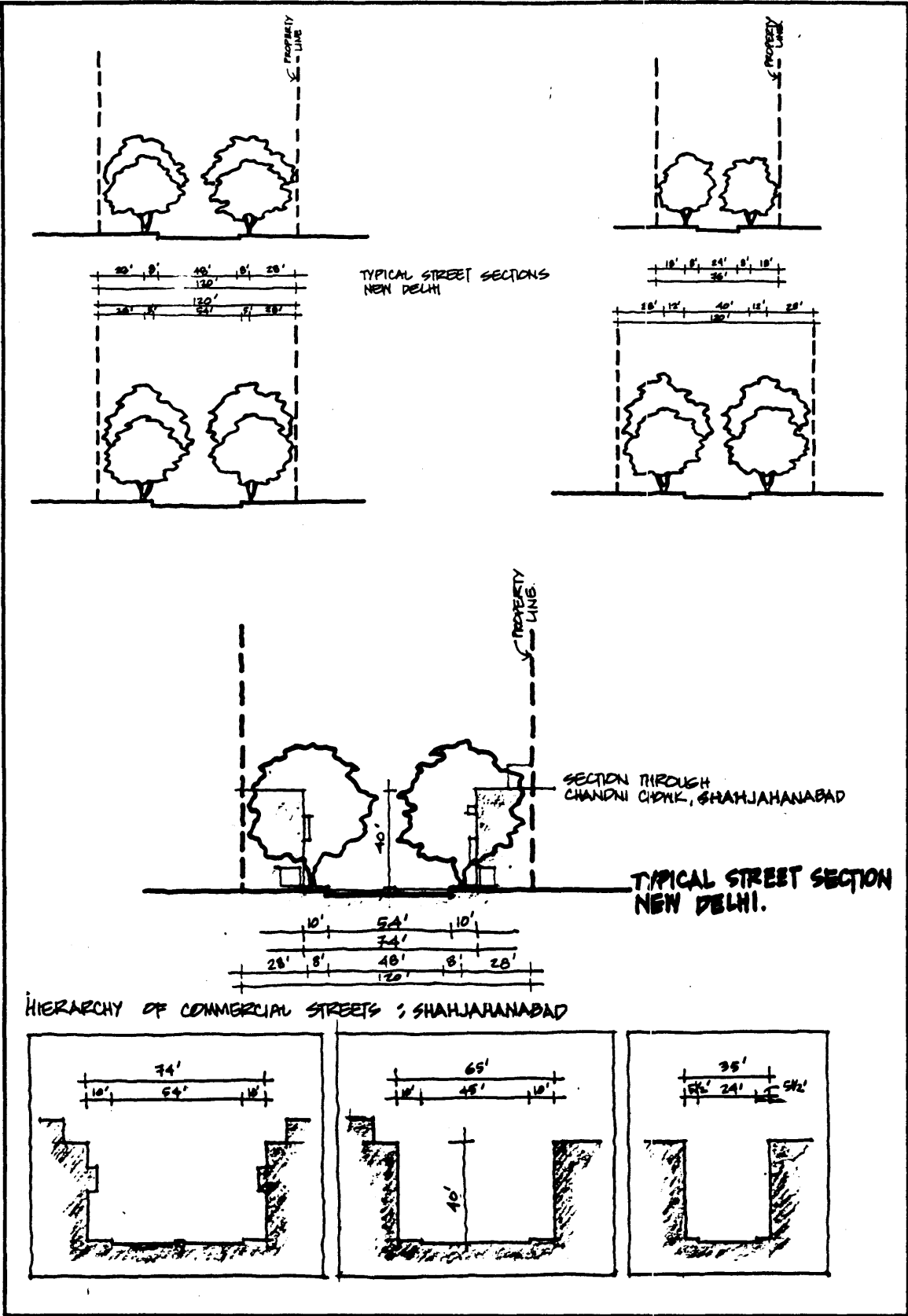
Hierarchy of Streets

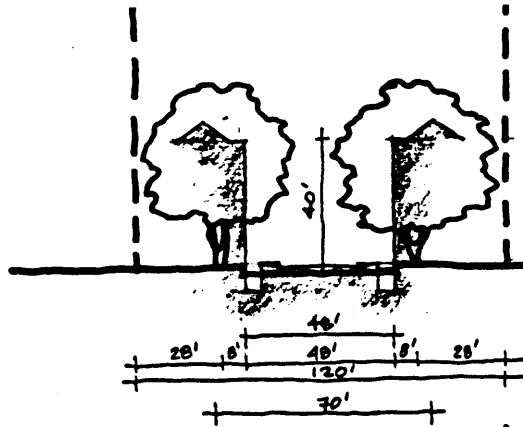


If we try to recreate this hierarchy of streets in New Delhi, the existing avenues would form the higher level of streets serving as peripheral streets for neighbourhoods of two or three existing blocks, or as central axes through neighbourhoods. Off these, secondary vehicular and pedestrian streets would define smaller blocks. It is not possible or desirable to transfer directly the tortuous dead-end streets of the mohalla. The concept of community reflected in the semi-private nature of such streets, based on kinship and occupational ties and the extended family, no longer holds true and the essentially pedestrian character of these streets have to be adapted to accommodate faster, mechanical modes of transport.

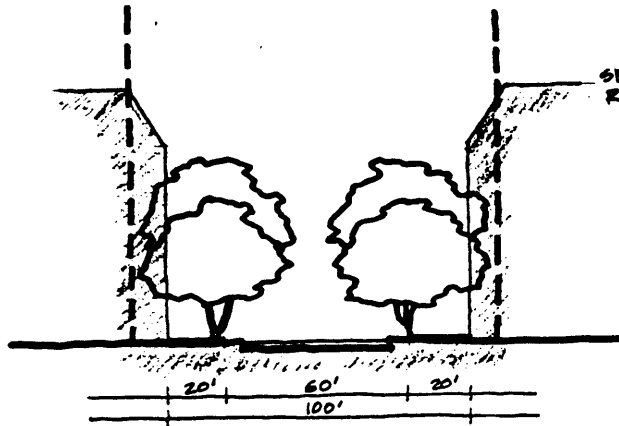
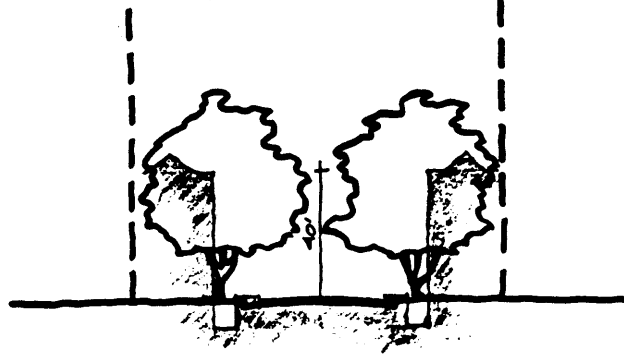
What would give these avenues the vitality of a street like Chandni Chowk ? This seems to be a function of the relationship of the street to buildings which frame it and the edges between them. What then should be the height of buildings on either side of these streets and the distance between them ? Chandni Chowk is too narrow compared to the existing avenues to tell us much in terms of actual dimensional relationships. For this we have to look elsewhere, to urban streets that belong to the same tradition as the streets of New Delhi, namely that of the West. Through a comparison of such streets it is possible to establish a range of minimum and maximum dimensional conditions for the relationship between street and building and the edges between them. This is not to say that there is something magical about such dimensions, but given that the streets and buildings we create today will be there long after we are gone, a study of existing environments helps to place us within time-tested traditions from which we can start to build something new. It is surprising how much innovation such traditions can accommodate.

Dimensional relationships

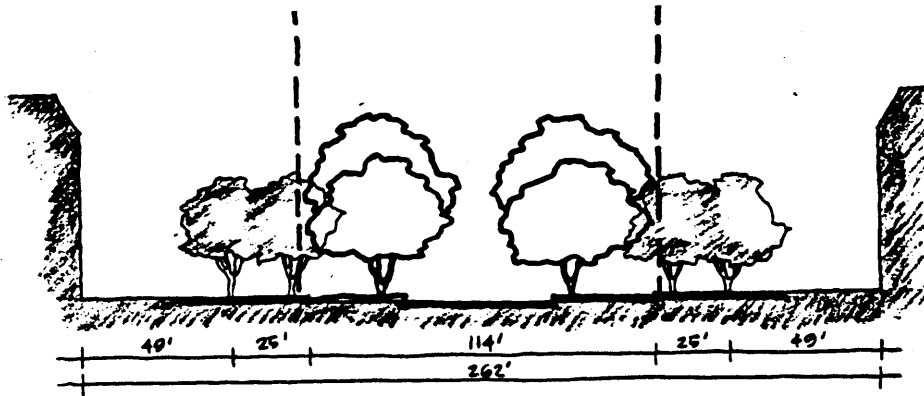




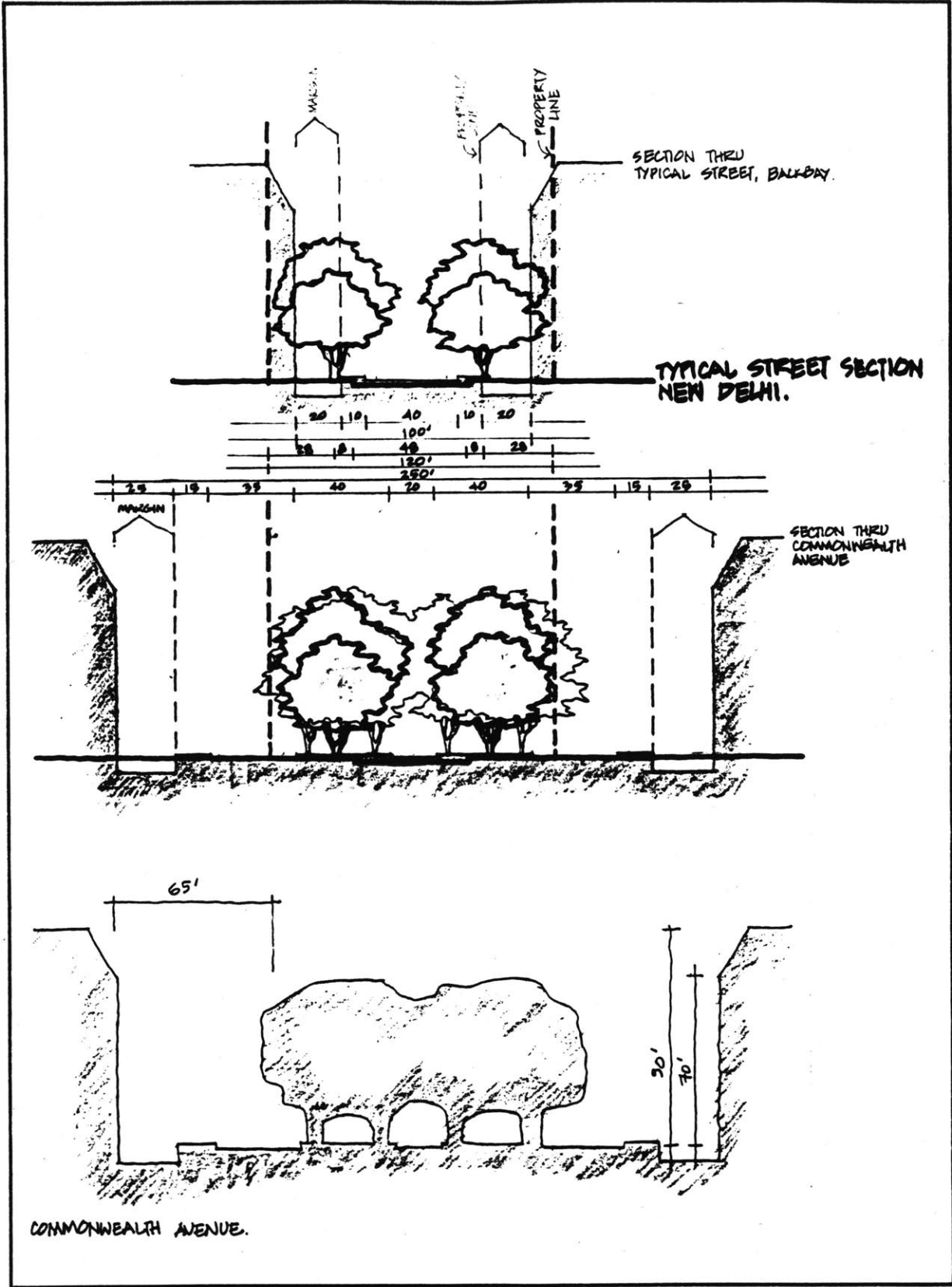
TYPICAL STREET SECTION
NEW DELHI.
TYPICAL STREET SECTIONS;
BATH.



SECTION THRU
REGENT STREET, LONDON.

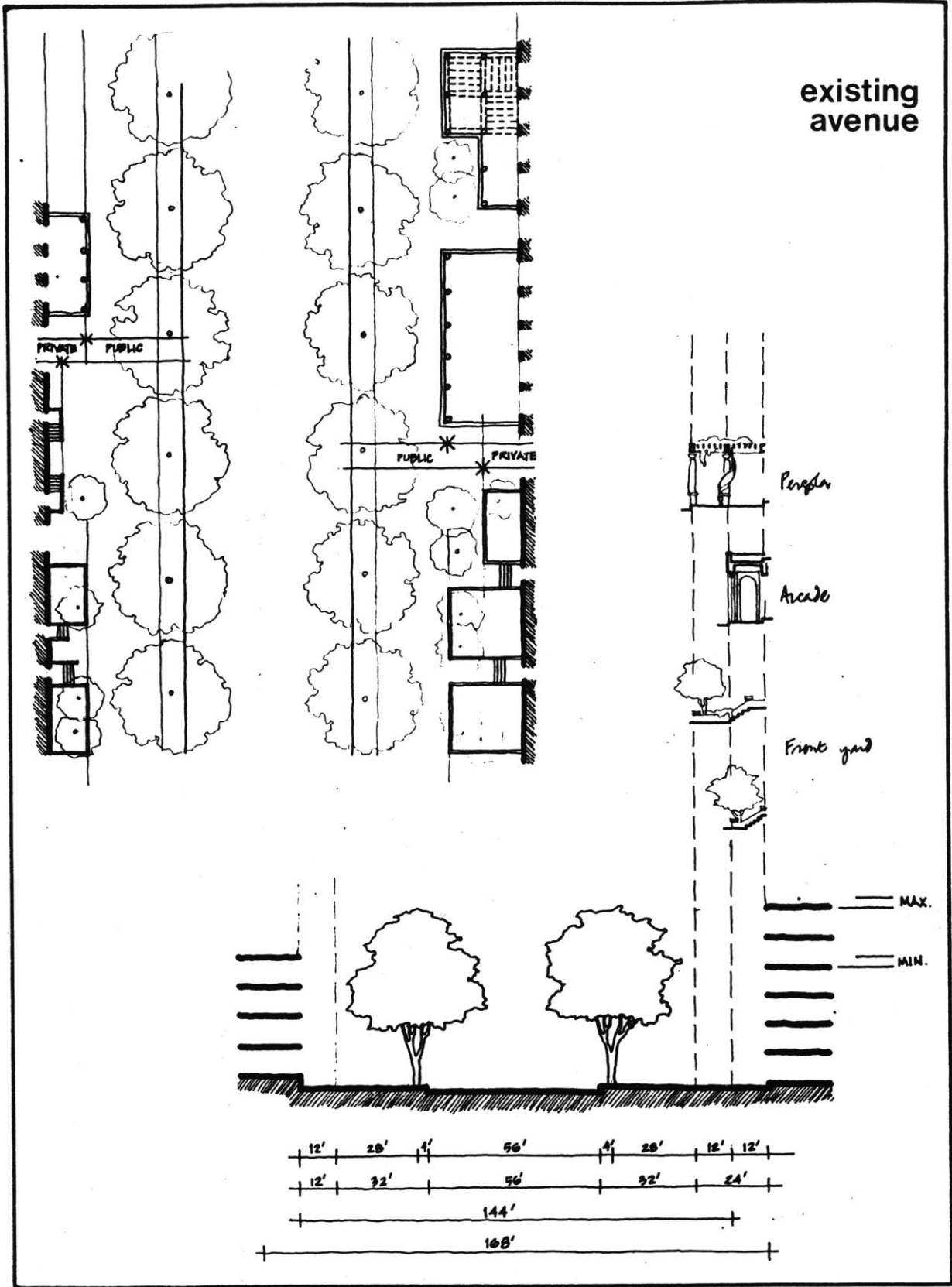


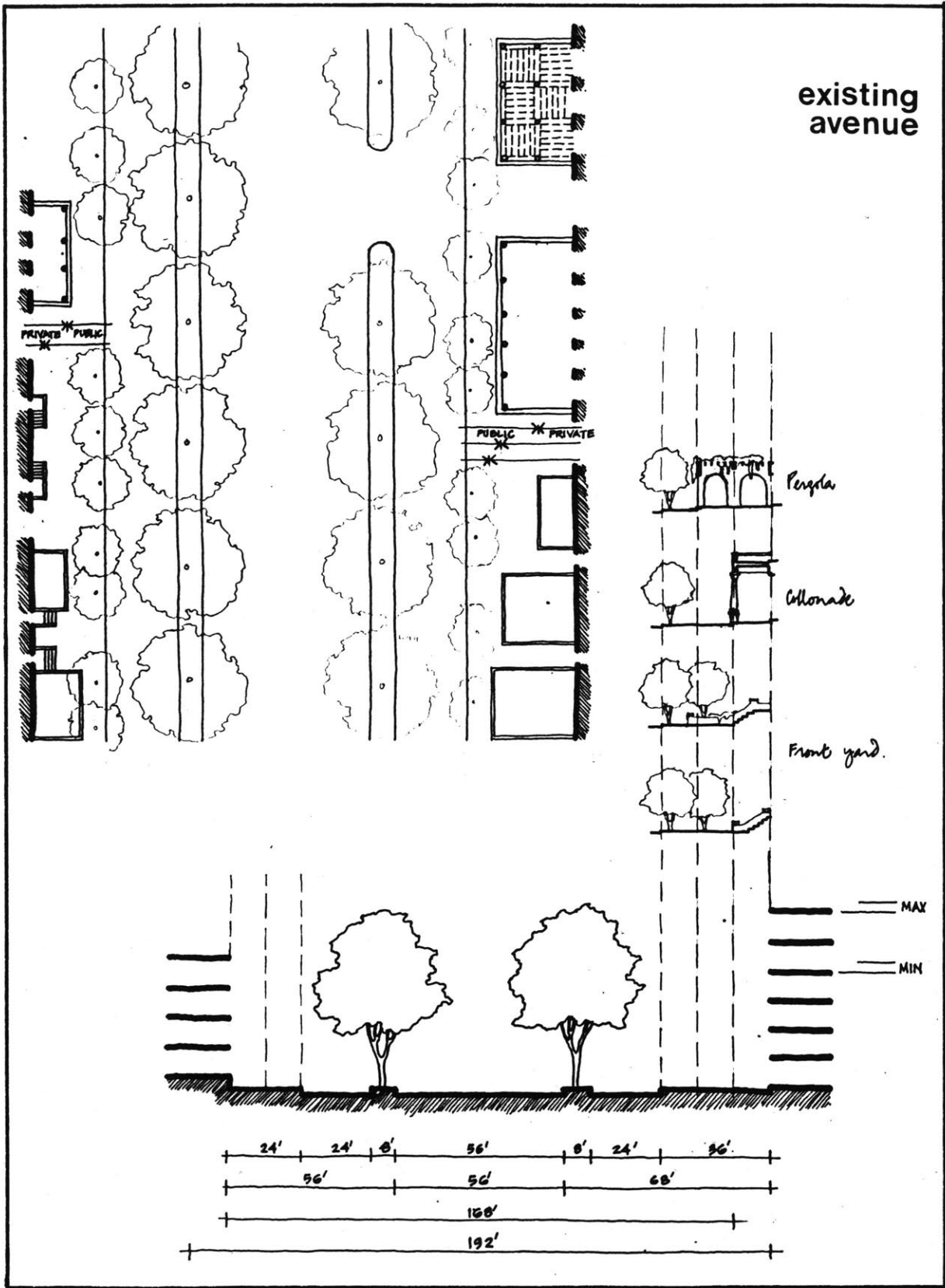
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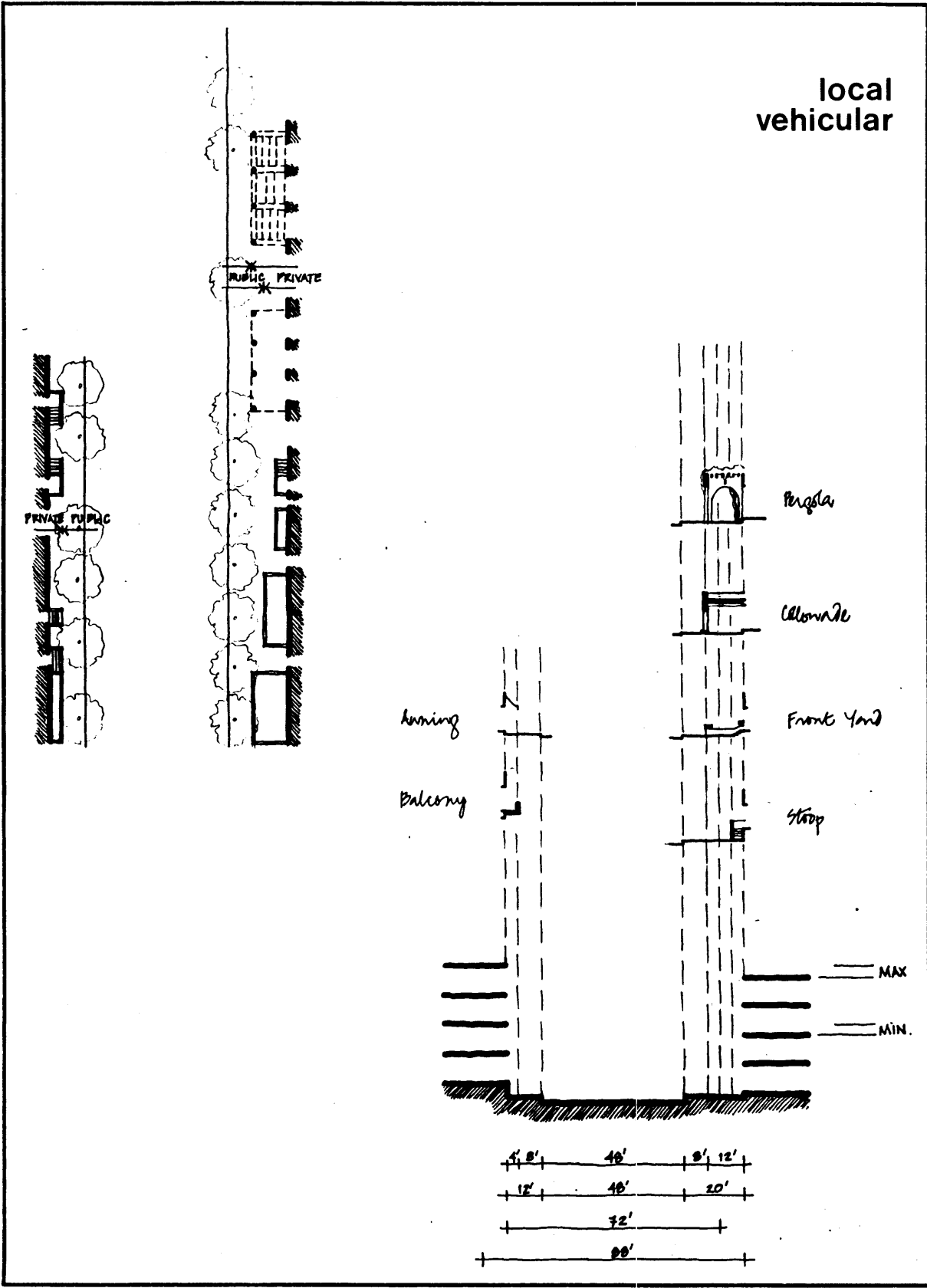
Possible solutions

Let us assume, for example, that the distances between buildings along the existing avenues could range from 144' to 192' as shown in the drawings, determined by two basic conditions : one where the avenue is a through street, peripheral to an area and the buildings relate to a smaller local street, and two, where the street is a unifier, tying together two parts of a whole and the buildings relate directly to it. Within these, the edges accomodating the transition from public to private could be margins of 24', 12' or 4', each of which contain a range of possibilities from arcades and pergolas to front yards and stoops. This range defines the typology of the street. Individual expressions of this type could be based on a selection of conditions from this range. This selection in turn will allow for small variations in the elements that constitute it. For instance, Janpath could have buildings relating directly to it with a wide public pedestrian zone followed by a margin where only arcades or only arcades and pergolas can be located. The definition of arcades and pergolas with minimum and maximum conditions, would produce individual variations within a common theme. Here the edge condition, a uniquely urban phenomenon, privately owned and maintained for public use, gives further definition to the street. Another street, say Akbar Road, could have a local street along it with a 12' margin of front yards. Tees January Marg with the Gandhi Smriti, could combine a wide green public, pedestrian zone with a 24' margin of private open space. Local streets could be either vehicular, 48 feet wide with parking on either side, or pedestrian, 30 or 20 feet wide, again with a definition of possible margins from say, 4' to 8 or 12' with stoops and front yards.

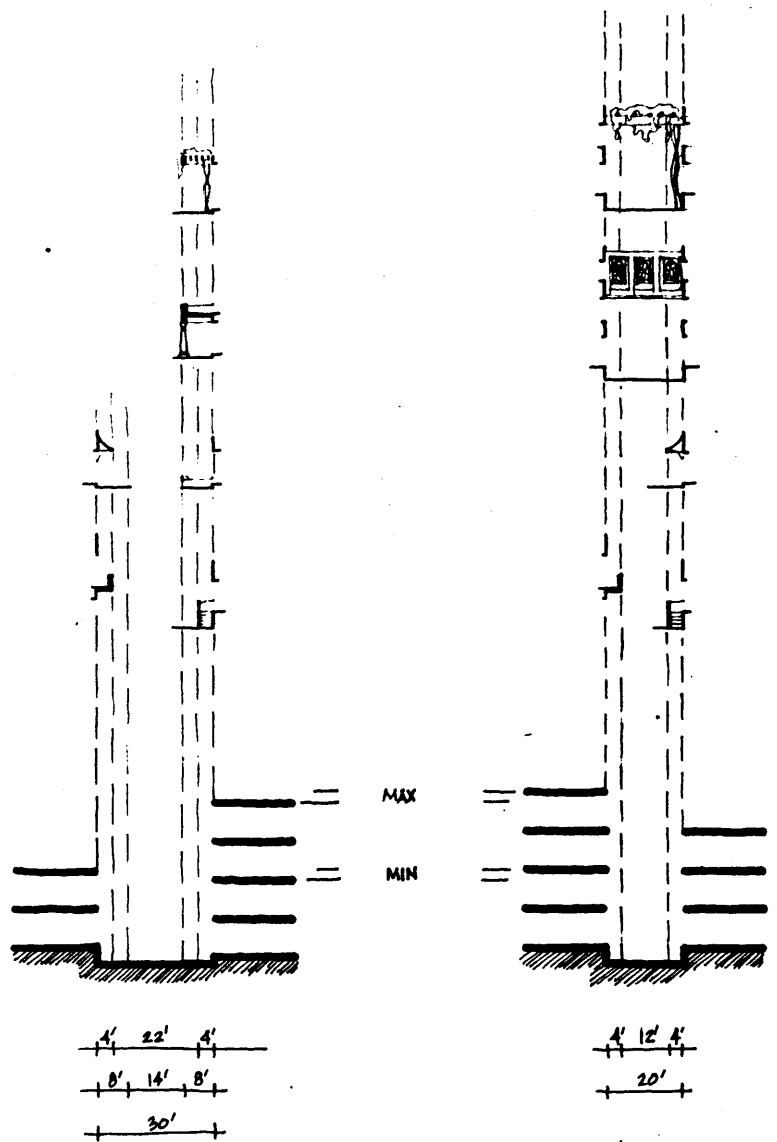
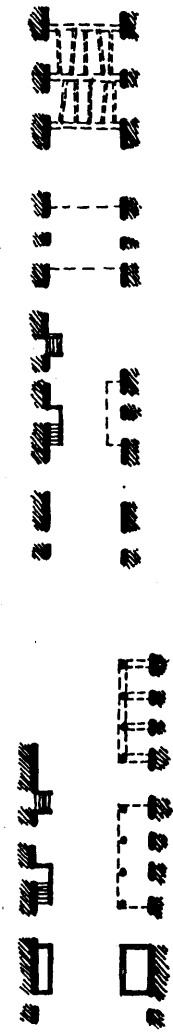


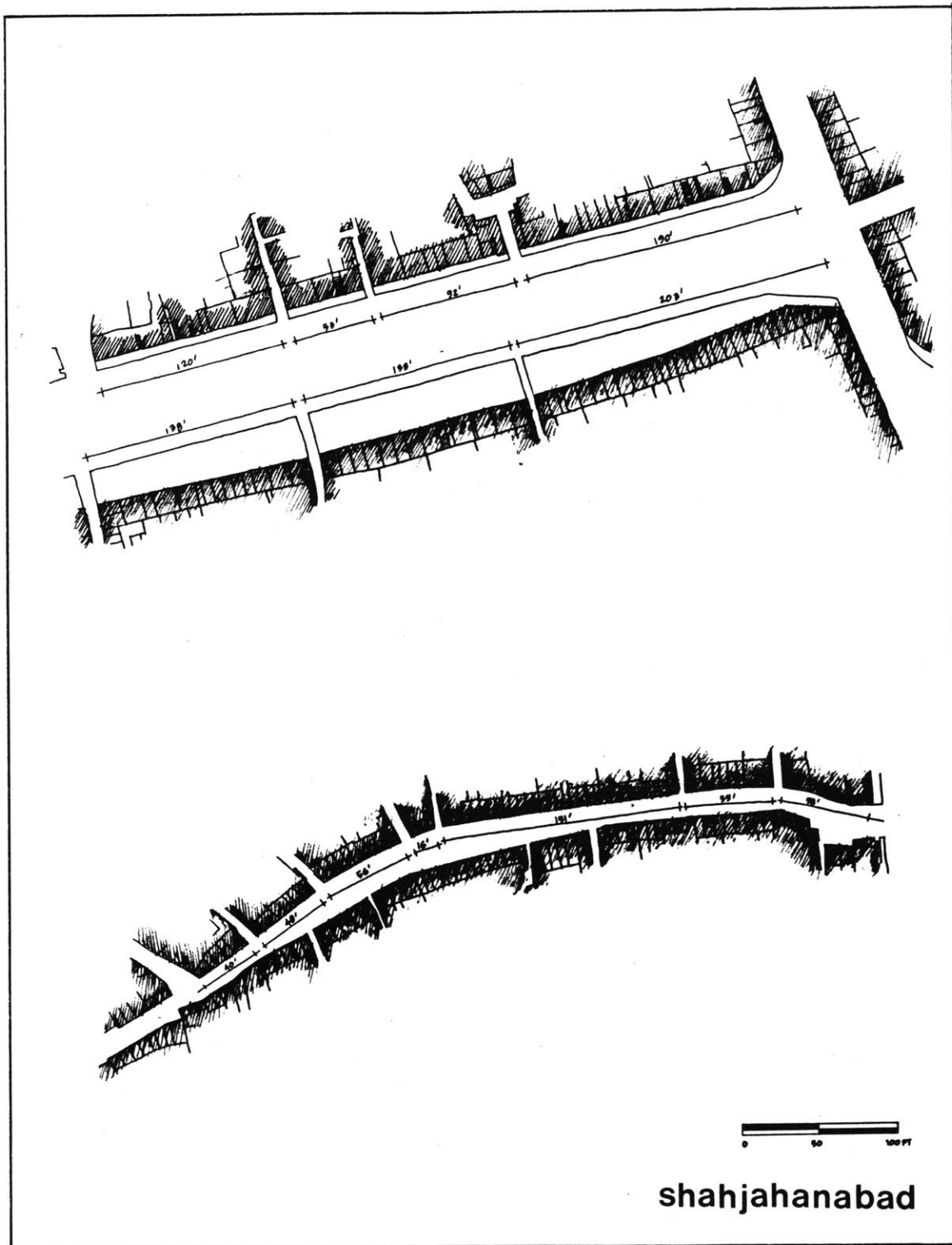


local
vehicular



local
pedestrian



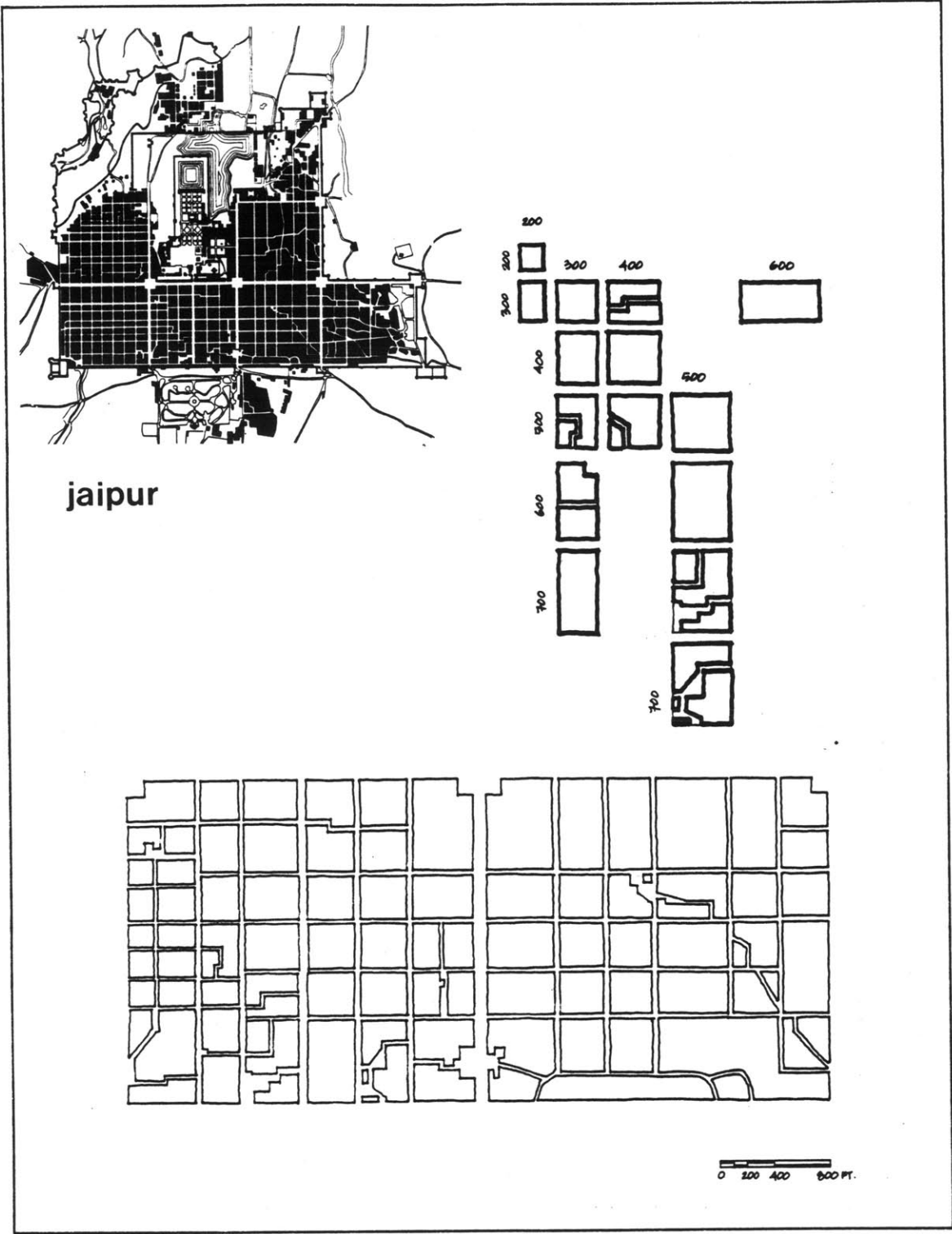


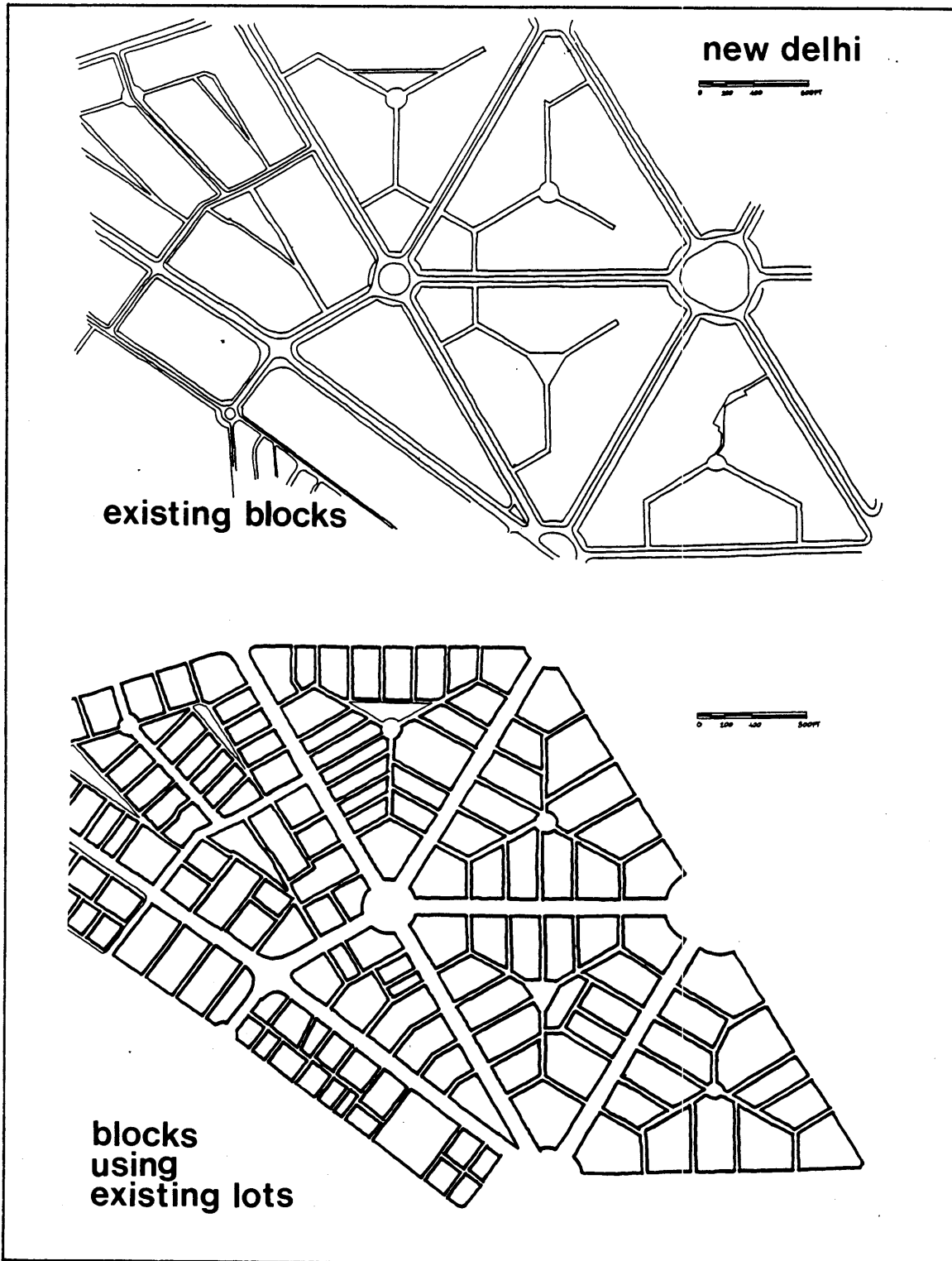
Blocks

This brings us to the question of intervals between streets leading off the main avenues, or the definition of blocks. There are no precedents to this phenomenon in Shahjahanabad where streets leading off the main streets terminate in cul-de-sacs. Here the center is what is important and the periphery is left undefined. This could possibly be adapted in a new context, but for the purpose of this study this option is not considered. The reason for this is that the dead-end mohalla street, upto 1200 feet in length and feeding areas in the range of 15,000 sq. m., with its subsidiary 'gali's implies a relationship between public, semi-public and private spaces based on conditions which, as mentioned earlier, no longer exist. Broadly speaking, the gradation of semi-public spaces, the shades of grey between public and private, have shrunk to a large extent and in the spatial structure determined by the transition from the extended to an increasingly nucleated family structure, there is a more direct relationship between public and private.

What we can look at, is the interval between streets leading off Chandni Chowk, although this cannot be used conclusively to decide on the size of blocks. The plan of the city of Jaipur, based on the Navagraha Mandala defined by nine large squares provides a more appropriate example. Here the Maharaja's palace occupies the most important central square or Brahma-sthana. Based on ancient Hindu texts on town planning and architecture, every caste was assigned a particular place within this organization of the city in a rigidly defined hierarchy. Whatever its origins, if we accept that there is no one to one correspondence between ideology and physical form which is reinterpreted through time, Jaipur provides a range of dimensions for urban blocks from 200 to 700 feet. Street

Comparable models

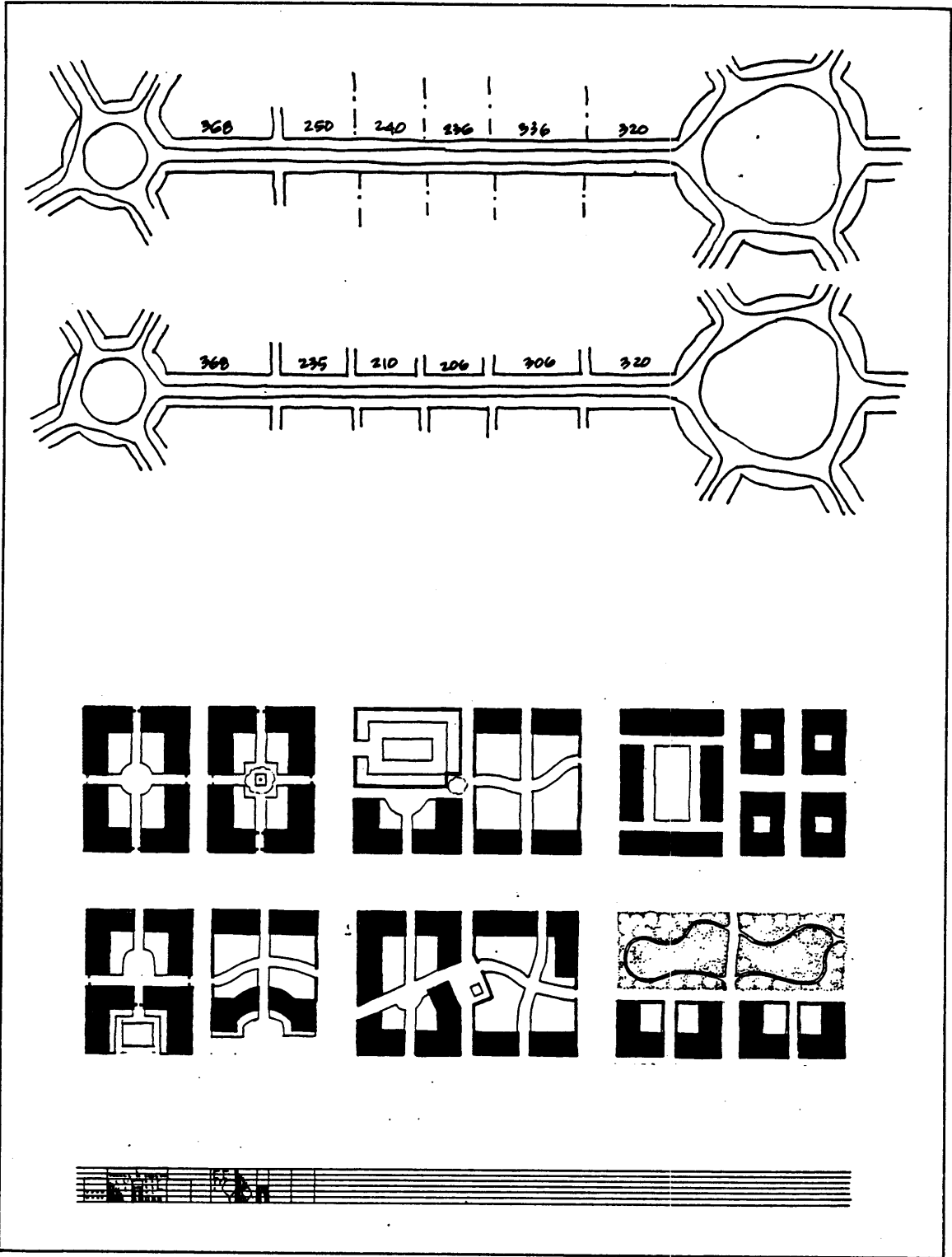


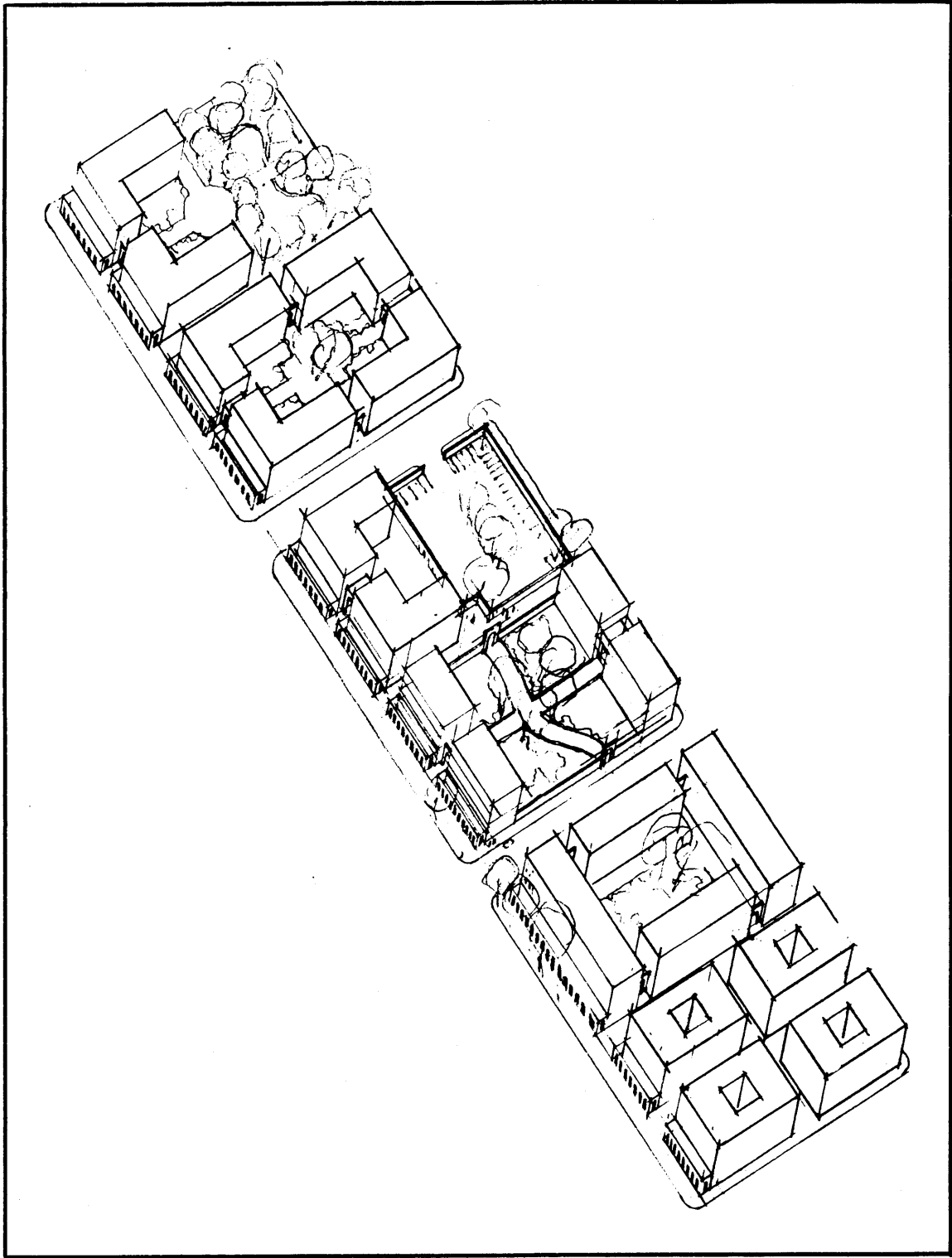


intervals along Chandni Chowk correspond to the lower end of this spectrum. If we look at Western models, this range corresponds almost exactly to blocks along Regent's Street in London. In Boston, urban blocks in Backbay are 250 X 400 to 600 feet. The implication is that the 1800 feet length of blocks in New Delhi could accommodate at least three smaller urban blocks to a side. As a rule smaller blocks are characteristic of dense urban centers, increasing in size towards the periphery. This has the virtue of having more street area in proportion to private or semi-public spaces, but it also means more public money. What is appropriate in New Delhi would be a trade-off between the two.

One solution is to use the existing lots which have frontages of 236 to 368 feet along Janpath as a basis. Vehicular streets could be located at intervals of every two lots with the option of a pedestrian street in between. This would give the possibility of having blocks measuring 200 to 500 feet along the avenues. In the other direction there is more leeway. But assuming that the interior of each block will have smaller subsidized dwellings, in order to have a reasonable sized area within the triangular blocks for this, the rear of existing bungalows furthest from the street can be taken as a reference at a distance of about 350 feet. Because of the triangular shape of the superblocks, only some streets leading off the main avenues will continue into the interior which will necessarily have smaller blocks to facilitate access to a large number of small dwellings. The building type adopted here, based on the 'katra' type found in Shahjahanabad, makes use of shared courtyards. Minimum and maximum dimensions of these would give blocks ranging in size from about 100 X 100 feet to about 170 X 170 feet.

Possible solutions





The basic peripheral block of 200 X 360 feet is built up on all sides. With a building depth of about 40 feet, the central open space can be shared by residents of the block or given over to private backyards or a combination of the two. Access could be from the street or through the central court which could be entered through gateways defining the semi-private nature of the court. On occasion paths through these blocks could become public.

Several variations of this basic block with a corresponding variation in densities are possible as illustrated. It could be built up on only two sides, keeping the built-up area fronting the main avenue a constant or the basic L-shaped building block could be turned around with a central open space fronting the street. Again the choice has to be limited to one or two conditions over a large area to give coherence to the fabric and the street. It is not necessary to have a wide variation in blocks. The same block can accommodate different building types. Where the block is not built up on all sides, 8 feet high walls punctured by gateways could be used to define the street and the entry into a semi-private space. In Delhi, almost everywhere one looks there is a wall, whether they are the monumental ramparts of the Lal Quila or the Purana Quila, the city wall of Shahjahanabad, the blank walls of introverted courtyard houses or the fragments from the past. Even minimal one-roomed dwellings, too small to have a courtyard, enclose a small front yard with a high wall defining the transition from public to private.

Variations

In terms of density, 200 X 350 feet blocks built up on two sides with an average height of four floors and average dwelling size of 1200 square feet is roughly equivalent to what the NDRAC

Density

and the Master Plan propose, about 75 persons per acre. If it is built up on all four sides it would be double that if it is exclusively residential.

In the interior, taking an average block of 144 X 144 feet with a building depth of 32 feet, an average height of three floors of which the first floor would be for workshops, and average dwelling size of 600 square feet, densities would be roughly in the range of 200 persons per acre. These figures are necessarily vague. Actual densities will depend the percentage of non-residential use. It seems reasonable to assume that the gross density, taking both interior blocks and fully built-up peripheral blocks, and admitting other uses, would be around 150 persons per acre.

Building Types

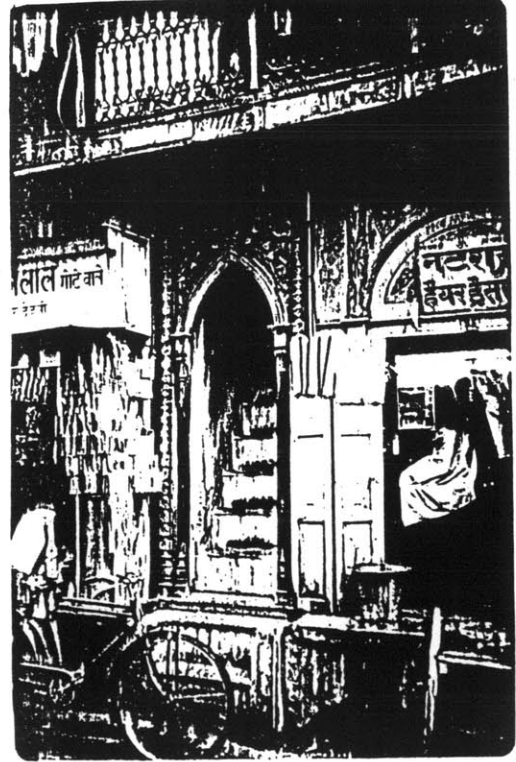
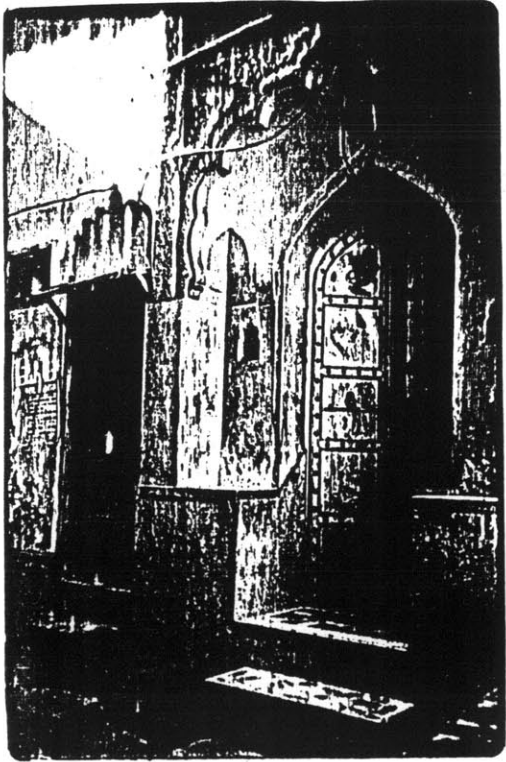
Having established a system of streets and blocks, we come to the building types. No linear sequence is implied here. On the contrary, it is a lateral shift between simultaneous processes: the study of blocks informs the study of streets and the study of building types informs the study of blocks which in turn inform the study of both streets and building types. In other words, it was neither the chicken nor the egg, or maybe it was both.

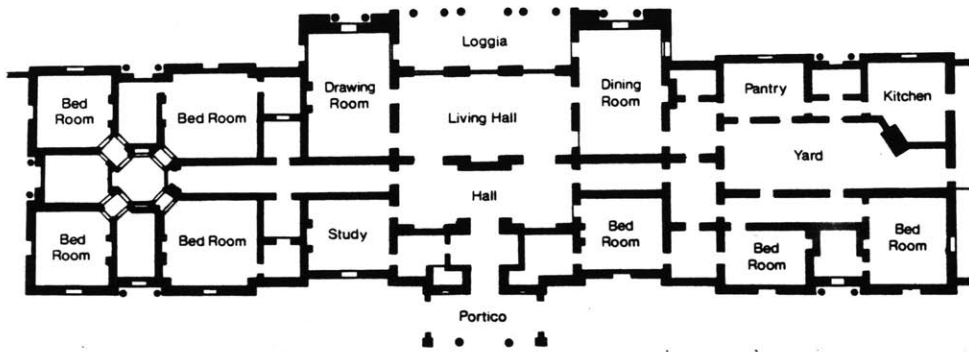
In Shahjahanabad, all buildings from the Jama Masjid, the palace, down to the smallest house, are organized around courtyards. Size and scale vary but the type remains the same. At the street level, its only expression is the ornately carved doorway, similar enough to give coherence to the street but at the same time each one is an individual interpretation of the type. Small openings and balconies enclosed by 'jali's or perforated screens start appearing above. Evolved over years, it was a type eminently suited to the hot, dry climate. During the day activities centered around the deep, shaded courtyard. At night the rooftop terraces were used to catch the cool evening breeze.

The courtyard type

With the British came the 'bungalow', the English country house adapted to Indian climatic conditions. Where the courtyard house looked in on itself, the bungalow looked out into expanses of green vegetation. Wide verandahs protected the walls from the sun and high ceilings with ventilators were used to keep the rooms cool. On the rear of these extensive compounds were barracks-like 'servants' quarters' accessed through 'service roads'.

The bungalow



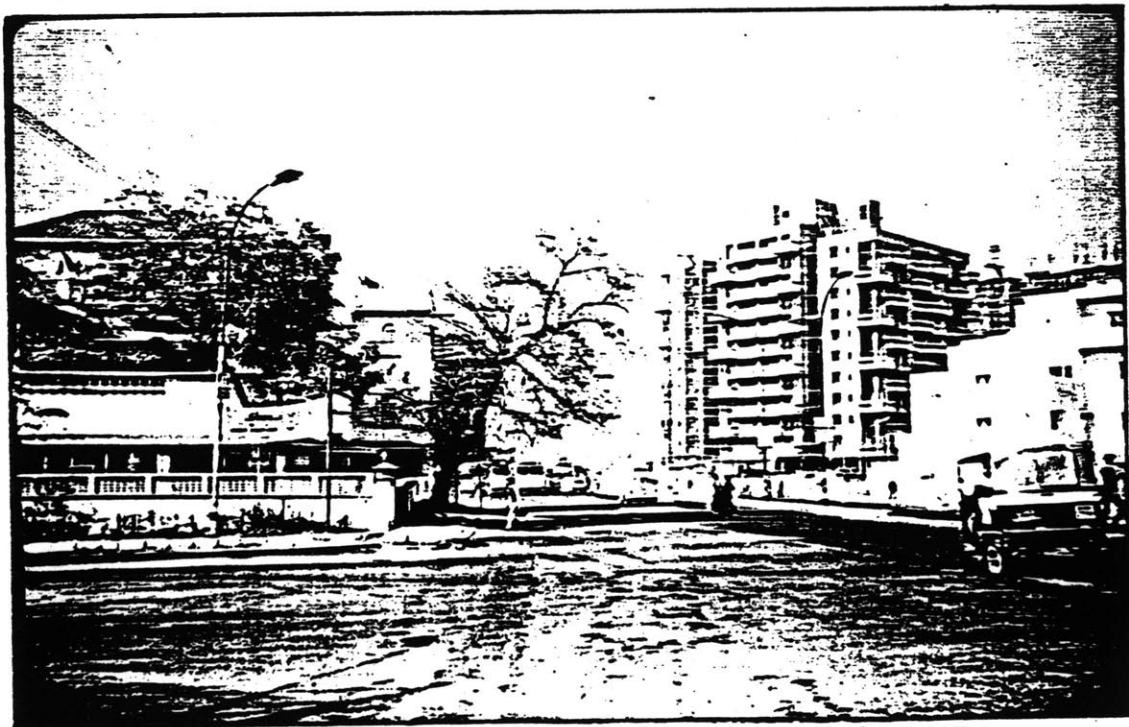
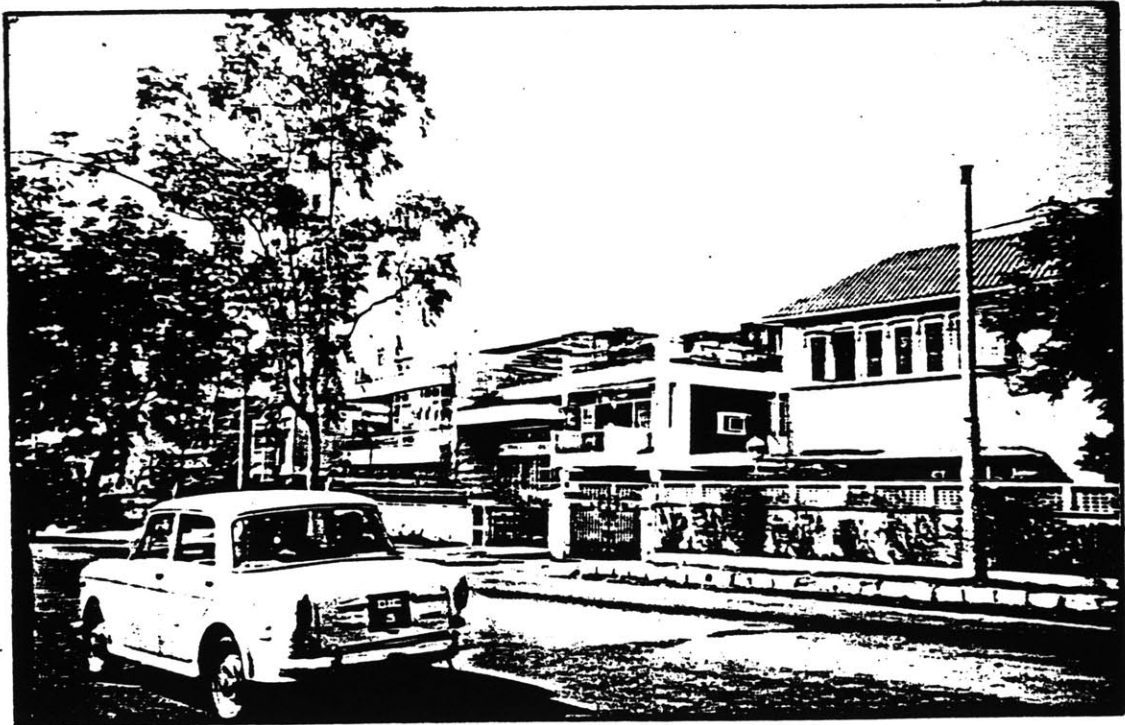


Ever since, this has been the model adopted in Delhi. The courtyard house has disappeared completely. Even if someone wanted to build one, existing bylaws on required front, back and side set-backs make it impossible. Under more impoverished circumstances, the open green space around the bungalow has been reduced to a caricature of itself. The one storeyed original has been replaced by two-storeyed structures with a 'barsati', a built-up area on the third floor covering 25% of the area of the floors below. Servants' quarters still exist, located on top of garages off service lanes on the rear of lots. Facades exhibit a great deal of variety, ranging from austere 'modern' exposed brick and concrete to a profusion of embellishment freely borrowed from all over the world that can only be termed kitsch. All this does not add up to a coherent whole.

The detached house

Recently, due to increasing pressure on land, detached and semi-detached houses on individual lots are fast being replaced by four-storeyed walk-ups as the dominant building type. This form of housing is usually developed by the government or by housing co-operatives. The reason for this is partly the fact that the Master Plan and the Urban Land Ceiling Act make it mandatory for lots larger than 1 acre to be developed as co-operative group housing where land is leased by the government to housing co-operatives formed usually by groups of people who share the same profession or workplace. This kind of organization is reminiscent of the mohallas of Shahjahanabad which were often formed by craftsmen practicing the same craft. It offers a great deal of potential. For example, as individual members own only their apartments, most decisions pertaining to the living environment are taken as a group, fostering a sense of community. In addition, shared

Co-operative group housing



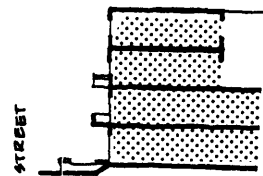
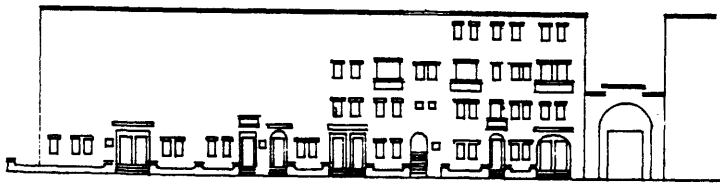
professions contain the potential of combining workplace with residence where appropriate, like in the case of the artists' co-operative that already exists.

However, its formal expression leaves a lot to be desired. The model of the house and garden won't go away, however far removed the four-storeyed walkup is from the colonial bungalow. Or maybe the buildings that zig-zag diagonally across large fenced-in estates are inspired by more recent models imported from the West. These superblocs exist alone, making no reference to what happens in the next block. One block could have exposed brick apartments with common access stairs, the next could have galleries and the next could be raised on stilts. No thought is given to how buildings relate to streets and the front door, so important in Shahjahanabad, loses all meaning. In Shahjahanabad even houses on upper floors have their front doors at the level of the street. Today, access to apartments on upper floors is through a common staircase shared by two to four apartments or a gallery shared by a larger number. The only feature of the courtyard house that has survived and is still actively used is the roof-top terrace. The intense summer heat in Delhi combined with frequent power cuts makes a private outdoor space necessary for apartments without direct access to the ground.

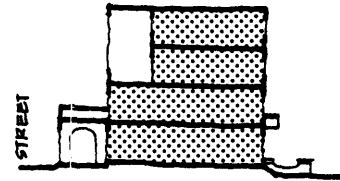
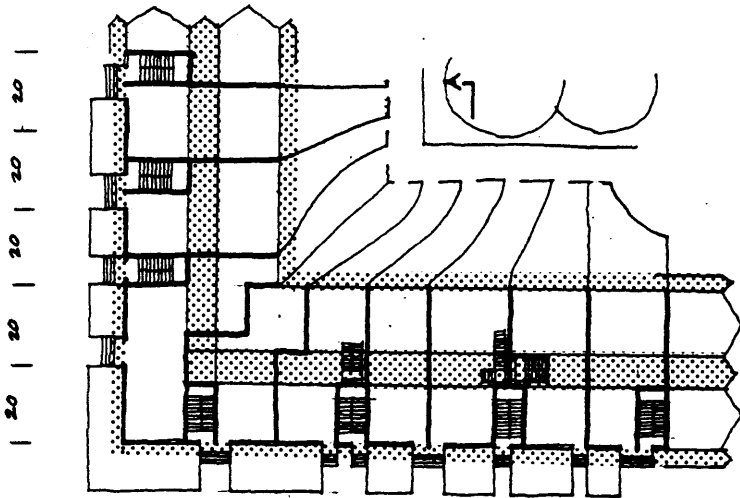
Walk-ups

The bungalow type of New Delhi is a suburban type that is not viable in a denser urban environment. At best the one-storeyed structures can be incorporated into the new fabric. The courtyard type no longer reflects how people like to live in Delhi. In the absence of a clearly defined existing building type that allows individual expression within a coherent whole as in the courtyard type of Shahjahanabad, a type that

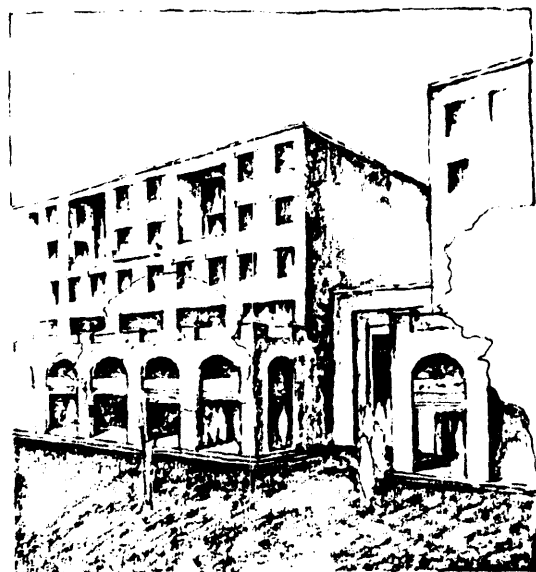
Defining a type



SECTION A



SECTION B



does all this based on changes in lifestyle reflected in the existing environment, incorporating features of the traditional courtyard type that can be adapted, has to be invented for New Delhi. This of course is not a simple task. All we can do is define a step in the right direction and hope that it will mature and evolve over time.

Since most of the lots in this area are of 1 acre or more, according to the Master Plan it would be developed in the form of co-operative group housing. Secondly, this would take the form of four- storeyed walk-up apartments. This does not necessarily preclude the courtyard type. We could think of apartments around individual courts stacked one on top of the other but this implies a reduction in built-up area as we go up which means there wont be a continuous street facade. Or individual apartments could be organized around communal courts. This has a precedent in the 'katra' found in Shahjahanabad.

Alternatively, as in the example illustrated, the existing four-storeyed model can be adopted and certain elements and relationships redefined. The basic type in these studies consists of two duplex apartments, one on top of the other. Unlike the existing model, apartments would relate to the street with a continuous facade. Access conditions found in Shahjahanabad could be adopted with entries to all apartments at street level. The lower apartment could have a small front yard with a low wall or a railing for definition and a backyard. The upper apartment could have a terrace opening onto the interior of the block to maintain a continuous street facade. Taking a nominal depth of 40 feet with two habitable zones and a service zone down the center, we can say that party walls can be

located at 12, 16 or 20 feet intervals giving apartments ranging from 1000 to 1600 square feet. Small margins of about 4 feet can be defined in front and back where balconies and stoops can project out. Other than that, buildings would follow the line of the street.

Several variations of this basic type are possible. If access conditions are reversed and entry is from the interior of the block, a communal open space can take the place of backyards. Here the courtyard type is used at the level of the block which takes the form of a large katra with a deeper built-up periphery. Terraces could take the form of double-height verandahs as in some existing examples, in which case they could also be admitted on the exterior of the block.

Variations

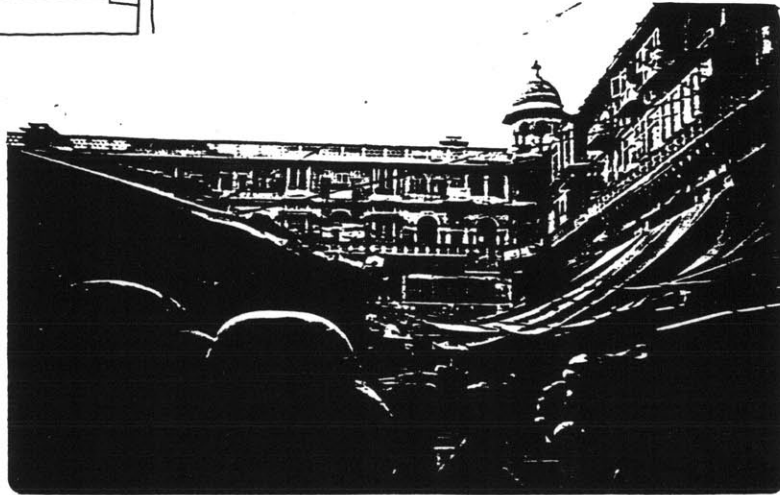
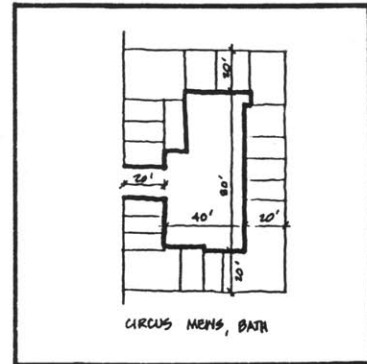
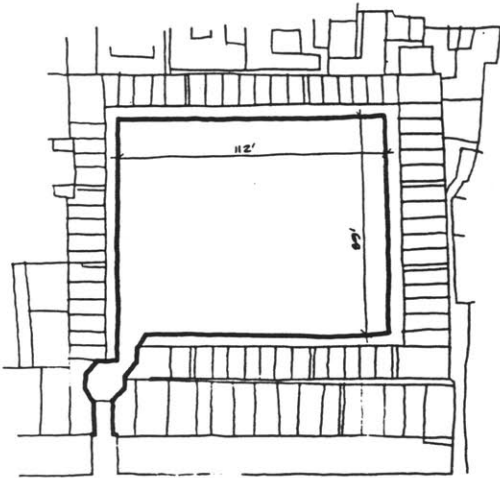
If more than two apartments are stacked one on top the other, individual street access would become a problem with a number of entries concentrated at one point. Here despite a personal bias towards individual street level access, it would be a better idea to have staircases shared by a small number of families as in the existing model. If we consider the maximum height of six floors along avenues, these could become larger elevator lobbies. In an extreme case, they could expand to form small internal courts serving about four apartments on each floor. This could be seen as the last semi-public threshold to private dwellings, and unlike the private staircase it has to be designed as a common meeting place for a small group of people and not just as a circulation space.

Building types in the interior blocks will differ from those on the periphery. The main reason for this is that only the bare minimum will be provided by the government at subsidized

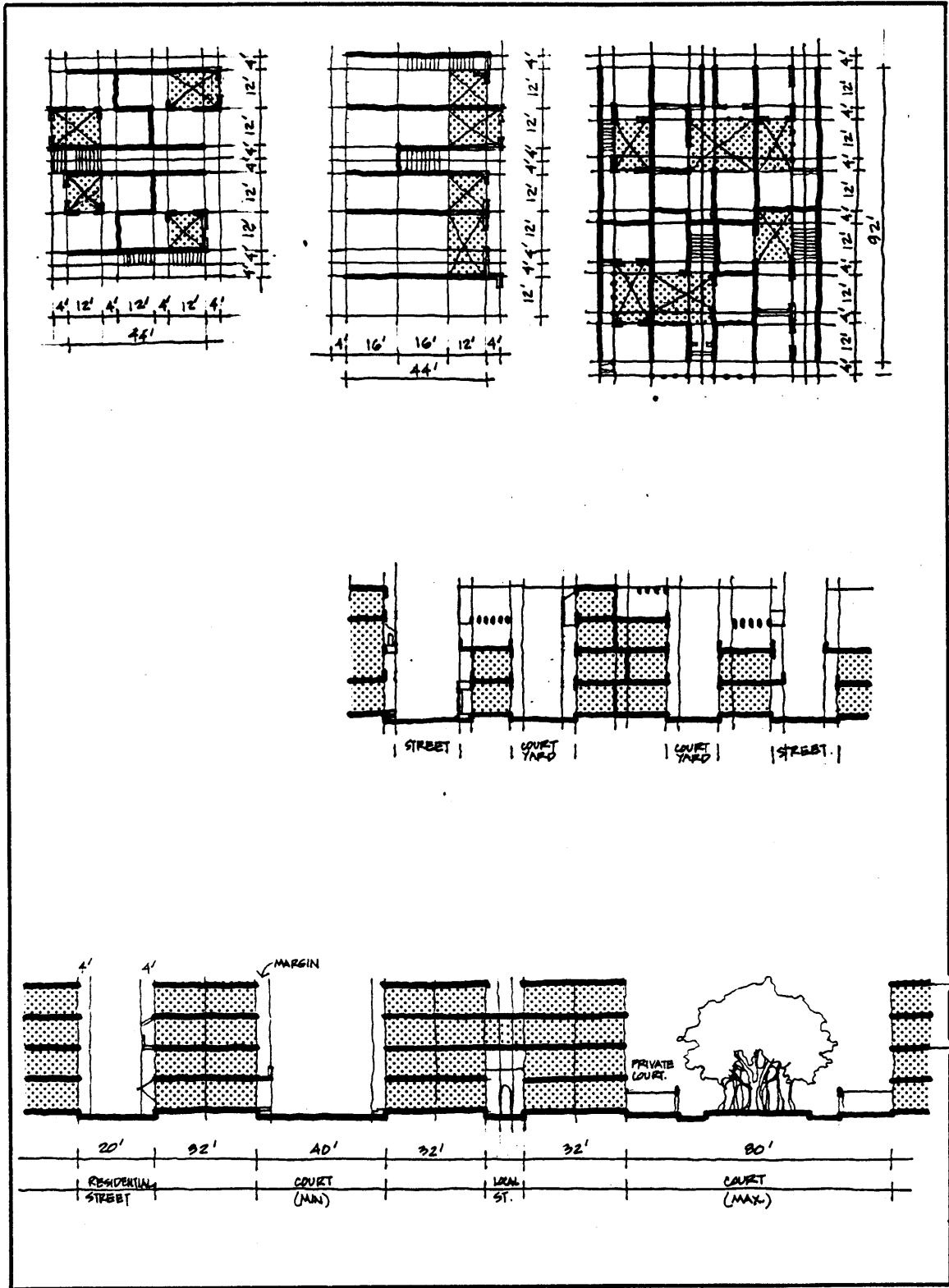
rates. These basic dwellings should be able to grow at the rate that the economic means of the residents permit. For this small lots owned individually are more suitable. At the same time, the concept of community becomes increasingly important at this level, where individual resources are limited. In the informal networks that already exist in the city, negotiation and co-operation and the exchange of 'favours' based on expertise or contacts in diverse areas, play an important role. Money rarely plays a part in such transactions. A community is also more effective in protecting the rights of its individual members than the individuals themselves acting on their own. In terms of space requirements, where accommodation is necessarily inadequate, lot of activities take place out of doors. Since it is not possible to provide large individual open spaces, these outdoor activities would take place in shared communal open spaces. Clearly the model of the housing co-operative is as valid here as in the peripheral development if not more so. The difference is that instead of apartments on different floors, individual members will have small narrow lots that can grow vertically over time. The limits of what can be done within these individual lots will still be determined by the community. Sale of individual lots could also be through the co-operative to ensure that the social objectives of subsidized housing are met.

In terms of physical form, the 'katra' type found in Shahjahanabad, where shops were arranged around a large courtyard with one or two floors of residential spaces above, can be easily adopted here. Dimensionally, the courtyards of these katra vary from 30 to 40 feet in width and 50 to 90 feet in depth. An extreme case of this type is the Serai Bangesh, originally a 'serai' or stopping place for travelers passing through. Today it is a wholesale market for spices with offices

The katra



KATRAS, SHAHJAHANABAD.



and residences above. The courtyard measuring about 90 X 150 feet, has been built over with one-storeyed structures in the center. In the West, the mews found in Bath for example, are similar to this type. Even dimensionally, courtyards in the range of 40 X 80 feet correspond closely to those found in Shahjahanabad.

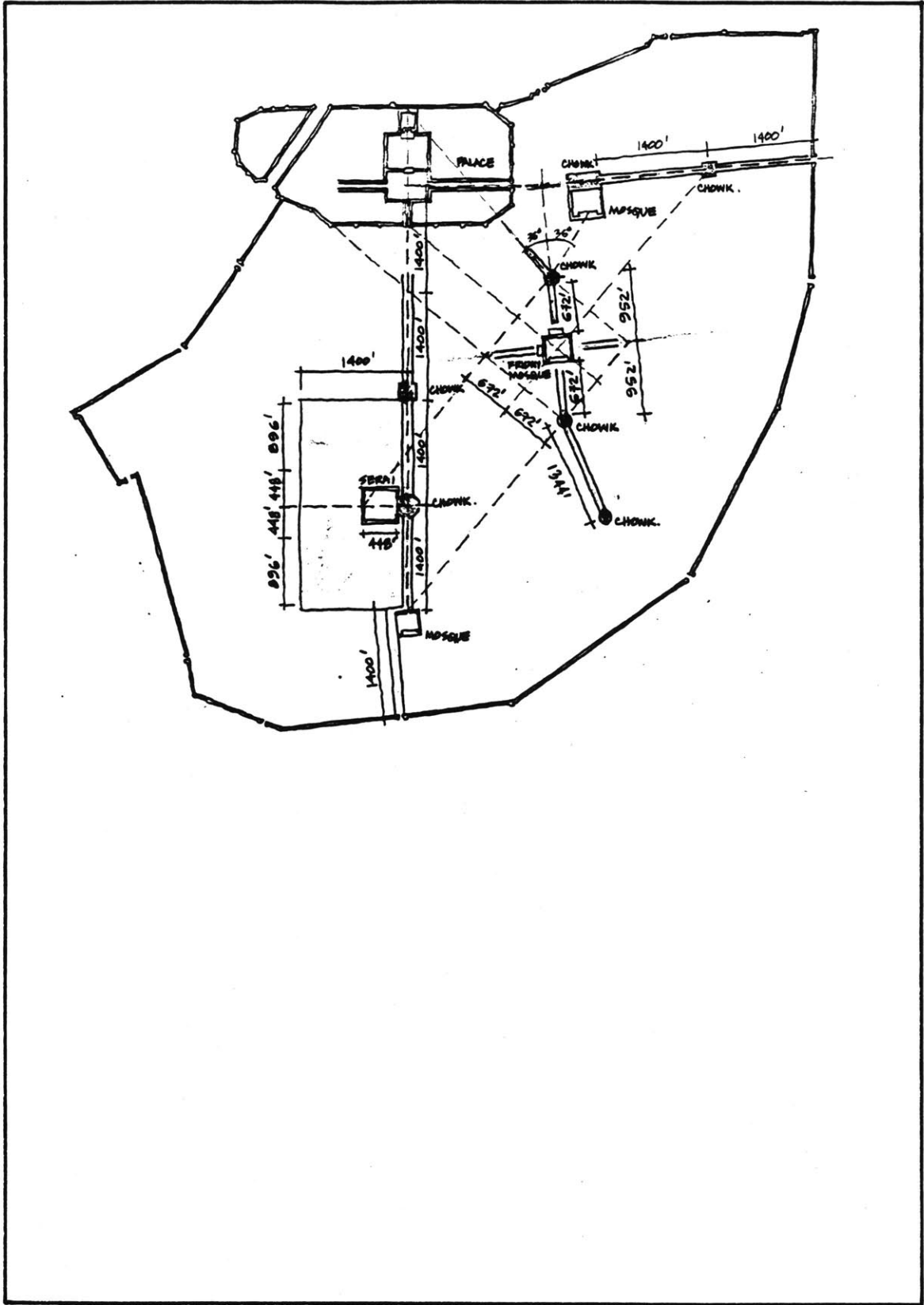
In the example illustrated, dimensions of the courtyard vary from 40 to 80 feet. The basic building depth is 32 feet with 4 feet margins at either end for balconies and stoops. Access to individual dwellings is through the central courtyard with the possibility of using the back room on the ground floor as a shop fronting the street. An increased depth of about 44 feet makes it possible to have a small private yard fronting the communal open space. A variation of this would be to have back to back units of lesser depth with access from the street and the courtyard. Another variant would be to have back to back units with individual, internal courtyards at an increased built-up depth of 92 feet. Access would be from communal courtyards or streets on both sides.

It would be reasonable to assume that a variety of household industries will function in this area given the example of comparable settlements in Delhi. Where an entire katra is inhabited by people practicing the same craft, the first floor could be given over to workshops.

In terms of facades, gateways could be used to give continuity to the streets and as a unifying element between the two types. They would also share elements like terraces and doorways and access conditions. The basic difference would be that of scale and rythm. As one moves inwards from the

Facades

periphery, it would be to an increasingly faster beat. Materials commonly used are brick and concrete. Usually buildings are plastered and painted, but some buildings including houses and apartments are clad in Dholpur or Red Sandstone. In the Rashtrapati Bhavan and the Secretariat buildings, Red Sandstone is used for the base with Dholpur above. This kind of cladding could be used selectively, depending on affordability. For instance, all gateways could use stone or, for a specific street, all buildings could be clad in Dholpur or Sandstone upto a height of one floor forming a base, or this could be confined to arcades and pergolas where these form a regular feature of the street.



Urban Spaces

Building types, streets and blocks together define the urban fabric which is continuous over a large area. In traditional urban environments the fabric is punctuated by a hierarchy of urban spaces that form nodes or focal points for a specific area. This can come out of the fabric itself or it can be generated by special conditions that are created or that already exist within a specific context, which act upon and are accommodated by the fabric.

In Shahjahanabad major urban spaces in the form of 'chowk's or squares are generated by the relationship between its monuments and major streets like the Chandni Chowk and Faiz Bazar. They often occur where two or more streets meet or where a street changes direction. On the east-west axis of the Jama Masjid, at a distance of about 672 feet, which is approximately twice the dimension of the mosque courtyard, there were two ten sided chowks, one in each direction. The eastern street was the route taken by the Emperor from the Lal Quila to his prayers at the Jama Masjid. At the chowk the street deflects to the north orienting itself on the center of one of the walls of the Lal Quila. Often these relationships are not physically evident. For example, one of the diagonals of the Jama Masjid terminates on the Lahori Gate of the Lal Quila. The other diagonal terminates in a chowk on Faiz Bazar, the secondary commercial axis running north-south between the Lal Quila and the Dilli Gate. The distance between this chowk and the Dilli Gate is about 1400 feet, a dimension that occurs often in Shahjahanabad. At 1400 feet in the other direction from this chowk is a mosque with another chowk. At the western end of the Chandni Chowk, the Fatehpuri Masjid is approximately 1400 feet from the city wall and the Lahori Gate.

Shahjahanabad

The total length of the Chandni Chowk is four times this dimension with chowks occurring at 1400 feet intervals. Most of this information is based on an article by Samuel V. Nee, 'Shahjahanabad : Geometrical Bases for the plan of Mughal Delhi', who traces the relationship of most major elements in the city to the Jama Masjid through the projections of its diagonals and the sides of a square generated with its east-west axis terminating in the two chowks, as the diagonal.

While these higher level of urban spaces are generated by invisible lines tying them to the Jama Masjid, smaller chowks occur more frequently and informally within the urban fabric, at the juncture of local mohalla streets, around a large tree or water point, or any place where people tend to converge.

Where would such spaces occur in New Delhi and what form would they take ? The Central Vista and the complex formed by the Rashtrapati Bhavan and the Secretariat buildings are the generator of similar relationships in New Delhi in the alignment of its major axis towards Purana Quila and the creation of 'places' at the confluence of its streets. New Delhi even has its own invisible tie with the Jama Masjid, in a street that is aligned towards the mosque although it does not physically link the two cities. The higher city level urban spaces already exist in the only 'urban' area in the city. Beyond this, 'places' are merely traffic islands and the equivalent of local chowks have no place in its suburban environment.

New Delhi

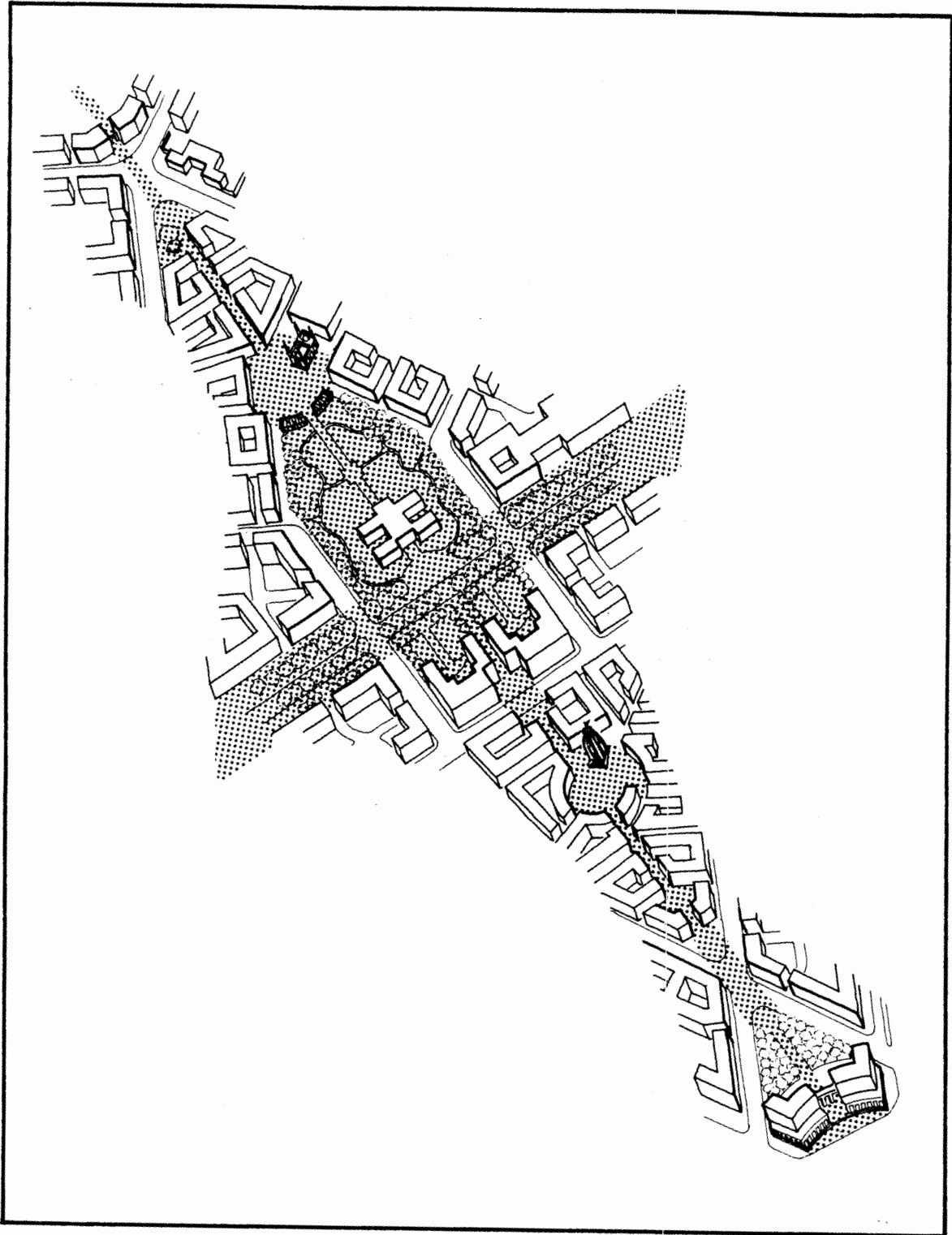
With higher densities, the need seems to be for the kind of urban fabric that can create opportunities for and foster smaller local urban spaces. These could be where two or more gateways into semi-private courtyards within blocks occur on

pedestrian streets or, where internal streets of blocks are public, at the intersection of these streets and local streets. One or two larger spaces could occur within each superblock in areas used by the whole community like a religious building or a theater.

As a rule this would be enough, but within the specific area we are dealing with there is a building, which although not designed as such, has through a chance encounter with history, become important enough to be a generator of urban form. This is the memorial to Mahatma Gandhi, the Gandhi Smriti. It is difficult to define and come up with any rules or even a controlling range on how to deal with such places. Clearly this is not a city level generator like the Jama Masjid in Shahjahanabad or Government House in New Delhi. Yet, throughout history there have been places and objects that have somehow become invested with meanings that demand acknowledgement.

The Gandhi Smriti

How important is this place ? That is a question open to interpretation. Perhaps it is enough to create a square in front of it. The illustrated example does more than that. Its place in the center of an existing avenue is reinforced by running a pedestrian axis through the two triangular areas defined by existing streets, that intersects the avenue at this point. Within the denser fabric this building stands alone in the middle of a park which extends along the avenue where buildings are set back more than they would be normally. One could think of non-thematic buildings like the schools of the NDRAC proposals being placed along this avenue, with its spaces being used for cultural events after school hours. Along the pedestrian axis in the middle of each triangular superblock is a



local urban space. In terms of location, these proposed urban spaces coincide almost exactly with existing circular intersections of service lanes. Coincidentally, the distance between them is approximately 1400 feet, which is the distance between major chowks in Shahjahanabad.

Conclusions

The intention behind the design studies in the preceding pages has been to explore an alternative approach to the densification of New Delhi.

It tries to give physical form to the objectives stated in the Master Plan of 'non-stratification in terms of income and occupation' and a 'more equitable distribution of densities' in the center of Delhi through the use of cross-subsidies and the location of subsidized, low-income housing on less valuable land in the interior of existing blocks.

Secondly, by using the old city of Shahjahanabad as a model, it attempts to reverse the values implied in the attitudes of existing regulations and proposals towards the two cities.

It demonstrates one instance of what is possible within the specific context of New Delhi given a specific set of assumptions, but neither the context nor the assumptions are central to the approach. It could be used to extend an existing settlement or in a new town. Similarly, in the studies, smaller houses and a denser fabric in the interior of existing blocks are linked to cross-subsidies. The pattern of occupation could well be reversed within the same physical form.

To a large extent the studies on type are inspired by discussions and courses taken with John Habraken. The illustrated example is necessarily limited by the fact that it is at best an individual interpretation of what is possible within an established type. Many individual interpretations are necessary for an understanding of the full range of possibilities contained in a type. Traditionally types evolved over long

periods of time and there was no need for explicit definition. In the absence of a clear implicit type, it becomes necessary to establish one explicitly. Ideally the establishment of a type should itself be an outcome of an interaction between people, so that it is as close to the 'shared image' Habraken talks about as possible.

Finally, the 'real world' and problems of implementation would inevitably intervene. However, this is beyond the scope of this study and not dealt with at all.

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