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Reimagining the Urban Grid : Synthesizing the Paradigms of Barcelona and Chandigarh to Envision a Timeless Capital for Amaravati

An exploration into urban evolution - drawing from the enduring legacies of iconic masterplans to articulate a minimalist yet visionary blueprint for India's next great capital.

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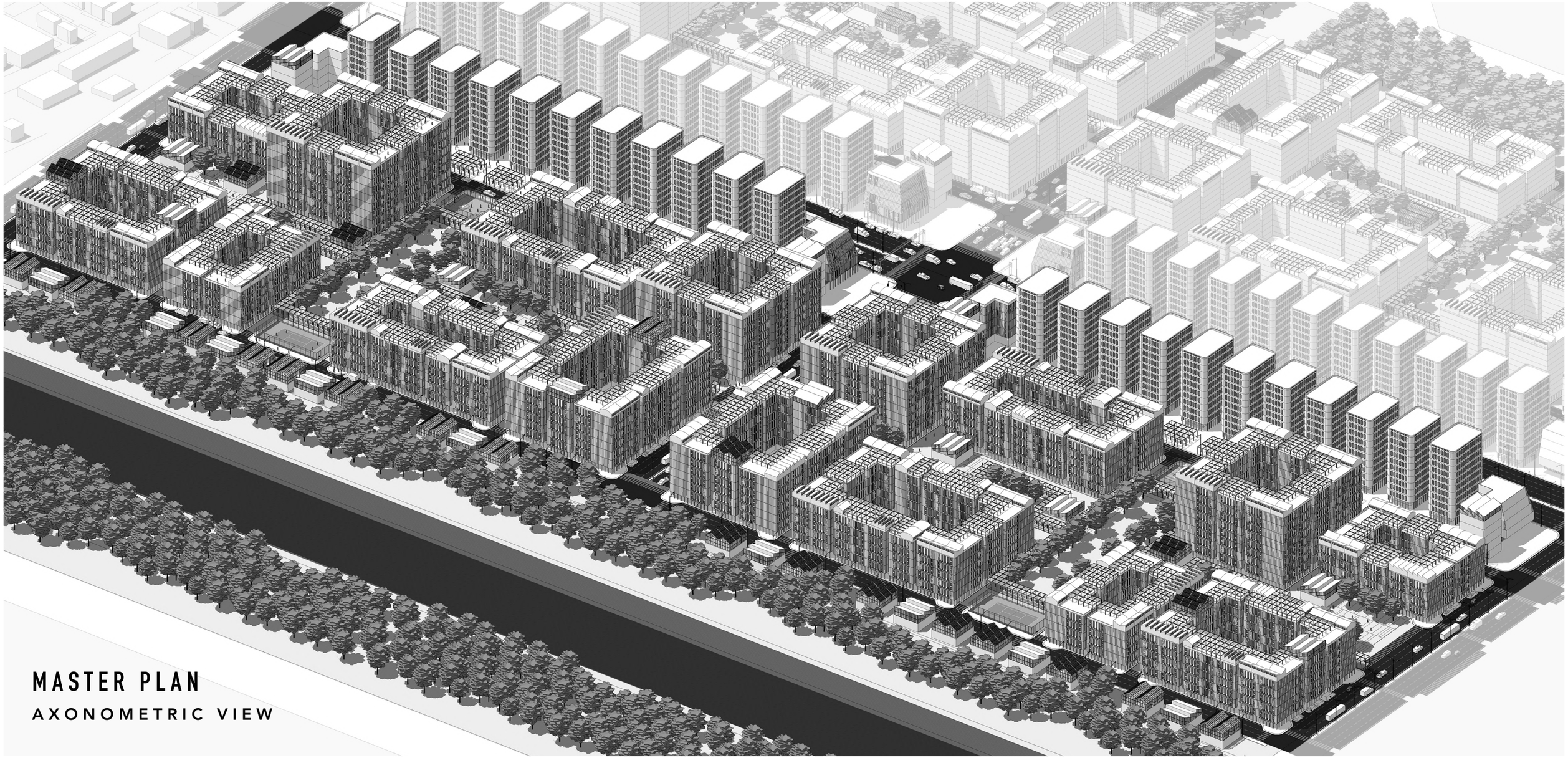

MASTER PLAN

AXONOMETRIC VIEW

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This thesis is dedicated to everyone who believes in the power of thoughtful urbanism and the potential of design to shape better futures.

PAPER OVERVIEW

This thesis explores the evolution and application of urban design principles by critically examining historical precedents, contemporary theories, and future-forward frameworks. Structured into six comprehensive chapters, the research begins with an analytical study of speculative and emerging urban grids that respond to futuristic needs—ranging from environmental resilience to technological integration. The second chapter presents an in-depth exploration of Ildefons Cerdà's groundbreaking plan for Barcelona, unpacking its methodological innovations, spatial organisation, block permutations, and the long-term impact of its partial implementations.

Chapter Three investigates the city of Chandigarh, India's first planned post-independence city, designed by Le Corbusier. This chapter analyses the city's sectoral grid, hierarchical street system, and modernist planning ideals, and evaluates its relevance and adaptability in today's urban context. Chapter Four then turns to minimalism in architecture, focusing on how reduced forms and materials can serve as tools for sustainable and human-centric urban environments.

Chapter Five grounds these theoretical insights in a comprehensive site study of Amaravati, the newly planned capital of Andhra Pradesh, India. The final chapter presents a design proposal for a selected site in Amaravati, integrating learnings from Cerdà's visionary urban expansion, Le Corbusier's modernist planning in Chandigarh, minimalist architectural logic, and adaptable urban grid typologies to propose a contextual, future-ready urban form. This research ultimately aims to bridge historical wisdom, minimalist ethics, and urban innovation, offering a framework for cities that are efficient, inclusive, and spatially coherent.

ABSTRACT

This thesis investigates the evolution of urban design through a multi-scalar and interdisciplinary lens, focusing on how past models, contemporary theories, and minimalist strategies can inform the design of future cities. It begins by examining speculative and emerging urban grids that challenge conventional spatial logics and respond to issues of sustainability, density, and adaptability. The study then revisits two significant precedents: Ildefons Cerdà's expansion plan for Barcelona and Le Corbusier's master plan for Chandigarh. Each case offers contrasting yet influential paradigms of urban organisation—Barcelona through its infrastructural foresight and grid adaptability, and Chandigarh through its modernist sectoral logic and zoning principles.

Further, the research explores minimalism in architecture as a lens through which to understand spatial clarity, efficiency, and human-centered design. These investigations culminate in a contextual design proposal for a site in Amaravati, the newly planned capital city of Andhra Pradesh, India. The proposal integrates lessons from historical precedent, minimalist design ethos, and futuristic urban frameworks to craft a spatially coherent, inclusive, and forward-thinking urban form. In doing so, the thesis proposes a model for cities that seek to balance functionality, identity, and resilience in the face of rapid urban transformation.

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INTRODUCTION

Urban design has always been a reflection of society's aspirations, challenges, and technological capabilities. As cities evolve, so do the planning principles that shape them—moving from rigid grids to organic patterns, from monumental forms to minimal expressions. This thesis explores the evolution and application of urban design principles by critically examining historical precedents, contemporary theories, and future-forward frameworks. It aims to draw connections between iconic examples of urban planning and emerging urban needs, weaving together threads of spatial logic, sustainability, and cultural expression.

The research is structured across six chapters. The first chapter provides an analytical study of various urban grids, particularly speculative and futuristic typologies, examining how grid systems can adapt to challenges such as environmental resilience, digital infrastructure, and population dynamics. The second chapter delves into the urban fabric of Barcelona, focusing on Ildefons Cerdà's expansion plan, a foundational piece in modern urban planning. His innovative methodology—especially the concept of the "intervía"—demonstrated a nuanced balance between built form and public space. The third chapter introduces the city of Chandigarh, India's first post-independence planned city, which showcases modernist urbanism influenced by Le Corbusier. Chandigarh's sectoral planning, traffic hierarchy, and symbolic spatial organisation are studied in detail for their relevance and long-term performance.

Minimalism, discussed in the fourth chapter, is evaluated not just as an architectural aesthetic but as a strategic urban principle. It investigates how minimalism fosters clarity, human-centric environments, and resource efficiency within dense urban contexts. Chapter five then shifts to the site-specific context of

Amaravati, the planned capital city of Andhra Pradesh. Here, a comprehensive site study explores Amaravati's design goals and spatial constraints, forming the groundwork for the final chapter.

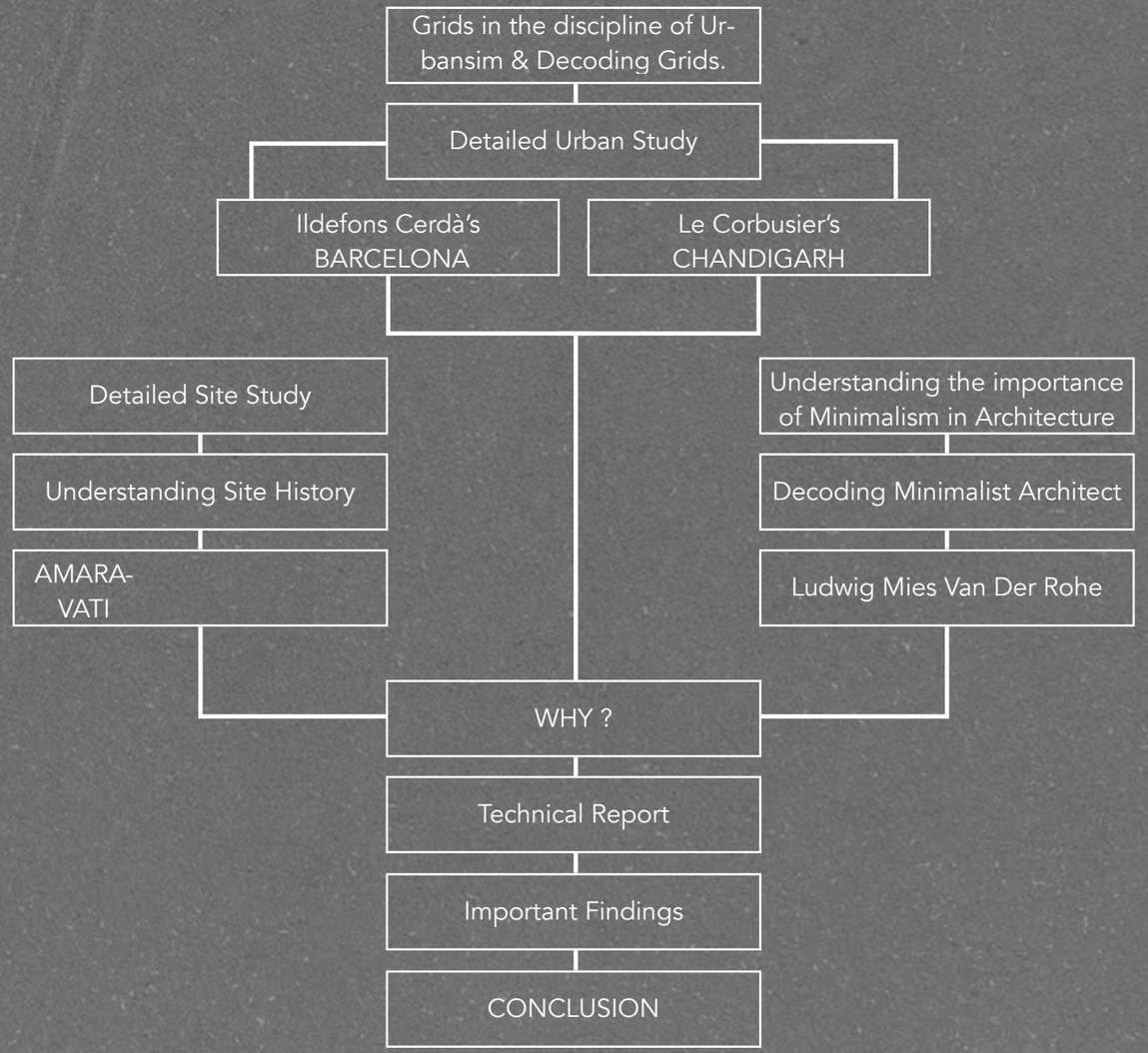
Le Corbusier's master plan for Chandigarh stands as a seminal example of modernist urban planning in post-independence India. Conceived as a symbol of the nation's progressive aspirations, the city was meticulously designed with a gridiron pattern, dividing it into self-contained sectors, each functioning as a neighborhood unit. The plan emphasized a hierarchy of roads, known as the '7Vs', to segregate different types of traffic and ensure efficient circulation. Central to the design were the Capitol Complex, City Centre, and extensive green spaces, representing the 'head', 'heart', and 'lungs' of the city, respectively. This human-body analogy underscored the holistic approach to urban design, integrating functionality with symbolism.

In contrast, the planned city of Amaravati represents a contemporary approach to urban development, aiming to blend technological advancement with cultural heritage. The master plan, developed by Foster + Partners, envisions a 217-square-kilometer city with a focus on sustainability, inclusivity, and connectivity. Key features include a central government complex, mixed-use developments, and an emphasis on pedestrian-friendly and transit-oriented planning. The design also seeks to integrate existing villages and celebrate the Krishna River as the city's lifeline, reflecting a commitment to preserving local identity while embracing modern urban principles.

Together, the case studies of Barcelona, Chandigarh, and Amaravati offer key insights into the evolution of urban form. The final chapter translates these lessons into a design proposal for a site in Amaravati, blending Cerdà's grid logic, Le Corbusier's sectoral planning, and minimalist principles. The result is a context-responsive urban model aimed at spatial coherence, equity, and future adaptability.

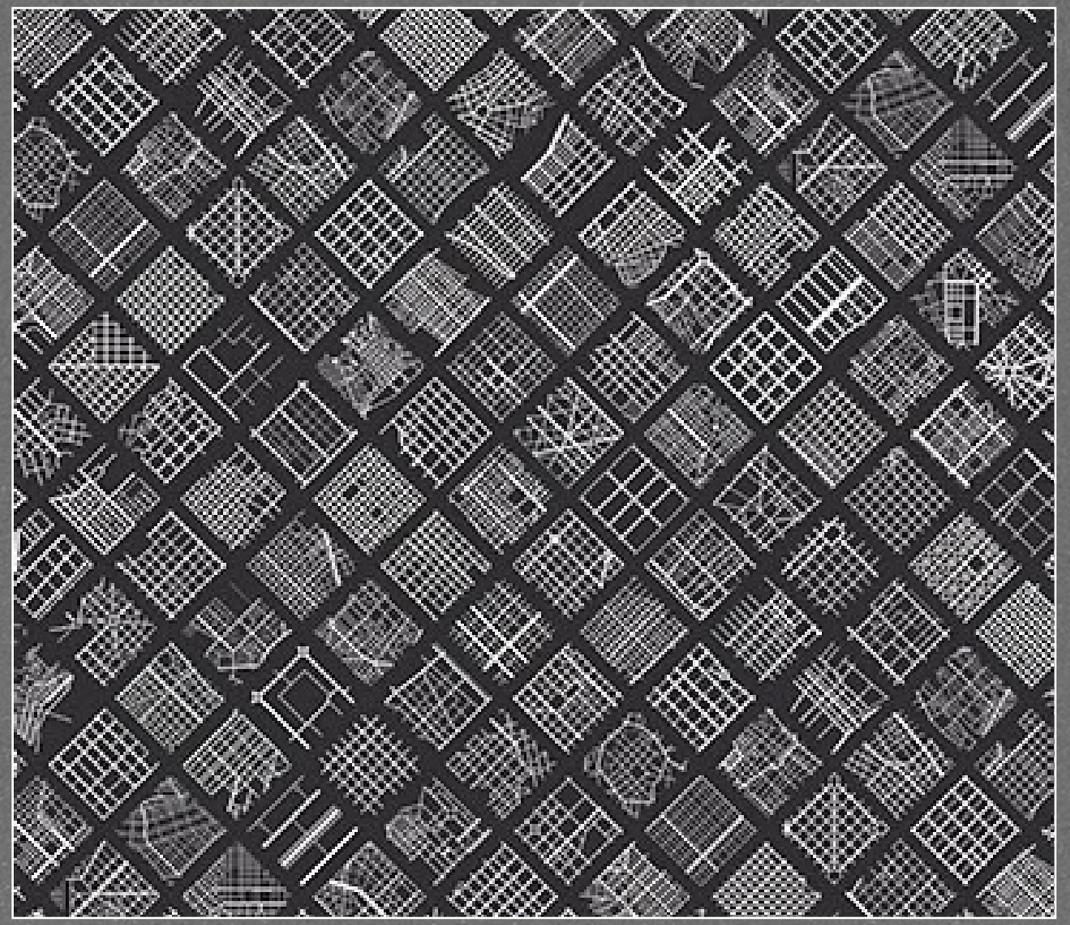
MEATHODOLOGY

This thesis follows a comparative and analytical methodology, beginning with a typological study of global urban grids to understand their spatial logic and adaptability. Based on this analysis, Barcelona and Chandigarh are selected as case studies to examine two distinct approaches to grid-based planning. The research then explores minimalist architectural principles—particularly open floor planning as demonstrated in the works of Ludwig Mies van der Rohe—to inform human-scaled design strategies. The site-specific study of Amaravati investigates contextual factors such as geography, history, and socio-political relevance. Synthesising insights from these chapters, the final design proposal applies learned principles to formulate a context-responsive and future-ready urban intervention.



1.1 INTRODUCTION

Urban grids represent one of the oldest and most enduring forms of city planning, symbolising humanity's desire to bring order to the natural world. They are not merely geometric patterns but expressions of civilisation itself—tools through which societies organise space, assert control, and envision the future. The act of planning a city in a grid is both technical and symbolic: it reflects rationality, clarity, and a belief in continuity across generations. From ancient settlements to modern metropolises, the grid has served as a visual and functional framework for urban life, shaping how people live, move, and relate to one another. As a recurring device across history and cultures, the urban grid continues to offer valuable insights into how we structure our environments and our collective aspirations.



The architect is first and foremost a constructor. He makes things, and his work is disciplined by the nature of recalcitrant Materials and physical laws. Moreover, he cannot give physical realisation to his work himself, and can only furnish symbols of his ideas for others to realise. As others will give physical form to his work, so others will inhabit it not only other individuals, but in all likelihood other generations, under the architect by the nature of his creation must come to terms with some conception of Universality.

A still more awesome responsibility, however, lies in the hands of the planner, for the creation of a city does not merely leave monuments for one's descendants to praise, curse, or ignore, but molds the very framework of their lives. “Main builds towns so that the town shall build his sons”. Never merely a creation of human life, the city symbolises the ordering of the life into a civilised pattern, and there is, in fact, no civilisation without the city. From its beginning city buildings has given visible proof of man's mastery over nature and his ability not only to govern his own environment, but to leave his descendants physical heritage embody a common ideal of life. However uneasy may lie the heart of its founders, the planned city is an act of faith in the future, implying a presupposition of security and the continuity of our way of life enabling one generation to plan for another. Planning is always optimistic, and as other acts may show what we are, the plan may show what we wish to be. The ideal city has always been a version of civilisation as we think it ought to be.

The successful realisation of any plan involves a collaborative partnership with posterity, and the plan itself must become a self explanatory guide to its fulfilment and perpetuation. For this reason, the planners must reach beyond the fashion of the moment and, avoiding the personal and idiosyncratic, imbue his scheme with clarity, harmony, and logic, perhaps the only element which he can feel certain the future will understand as he does.

The city plan embodies the gesture by which man takes position of space, impressing on that space the ordering of his mind and devising a comprehensible man-made world for himself and his creations. By what gesture does the man possess space? How does he make his mark in the natural world? On the surface of the planet Mars appears a network of straight lines which we used to call canals, and for this grew the attention that there might be life on Mars. (By “life,” of course, was meant an intelligent human sort of life with geometry, drawing boards, and surveying instruments.) And the whole spectacle of the universe the imagination could be most deeply stirred by the sight of a simple straight line on another planet. “Man walks in a straight line because he has a goal and knows where he is going.” Thus from a line communicated across the vastness of space was intuitively inferred the imprint of a recognisable intelligence of a comprehensibly logical mind.

Throughout history and human culture the town plan has become one of the universal signature of man. It is a signature consistently legible, as the language is perhaps the oldest human language—visual order. The physical ordering of the city we see a reflection of the order of human society in the conception of the larger ordering of the universe.

The social uses of the city have changed in part through time, yet have remained in many ways constant, and there is still validity in the much quoted statement of Aristotle, “A man is not a man unless he is a citizen. Men come together in cities in order to live; they remain together in order to live the ‘good life’—a common life for noble ends.”

Modern civilisation is urban civilisation. It is still the city which, as the Greeks phrased it, “teaches the man,” and what it teaches us about his life. It is now more than ever the city which shows us what we are and where our values lie, which presents us with both the best and worst of what we can be. It is often the worst on which we chose to do well, but one may remember also the statement of Louis Kahn about his native Philadelphia that, “A city is a place where a small boy, as he

walks through it, may see something that will tell him what he wants to do his whole life."

The city has usually been first of all place a clearly defined space visibly possessed and controlled by human beings and often scared to their gods, a statement of man imposed upon the chaotic and threatening vastness of nature. It has represented the desire of a man to master his own world, creating an environment reflecting his powers of reason, his desire for convenience and order, and his aesthetic predilection for beauty and meaningfulness in his surroundings.

Perhaps the oldest physical device of the urban planner is the well found enclosure providing both physical and symbolic protection and giving to the anonymous Earth a distinction and hierarchy allied to human purpose. As the city is a "place," so within the City there are "places" physically or visually and closed and defined the palace, the temple, the stronghold, the market, the form, the caste quarter.

Appealing also at an early date in the development of the access designed to control and direct moment and create visual focus. Particularly effective use of axis and inclusion may be seen in old peeping, where a monumental street was designed to lead directly from the main city gate through a series of world sectors and to culminate the most sacrosanct portions of the imperial compound. Does a dual purpose was accomplished, that of emphasising the protected and hierarchical nature of the forbidden city and that of maintaining a continual focus of attention on this area through the strong directional approaches. One is reminded also of the progression of enclosures in the Egypt Ian Temple complex or the Roman form and what was probably the culmination of axial composition in the expensive and all embracing ordering of the baroque. A frequently repeated use of the axis also appears throughout urban design in the cross access marking the town centre, observable in such diverse examples as the ritualistically laid out towns of ancient India, the military settlements of the Roman Empire, and the pre-Columbian capital of Mexico.

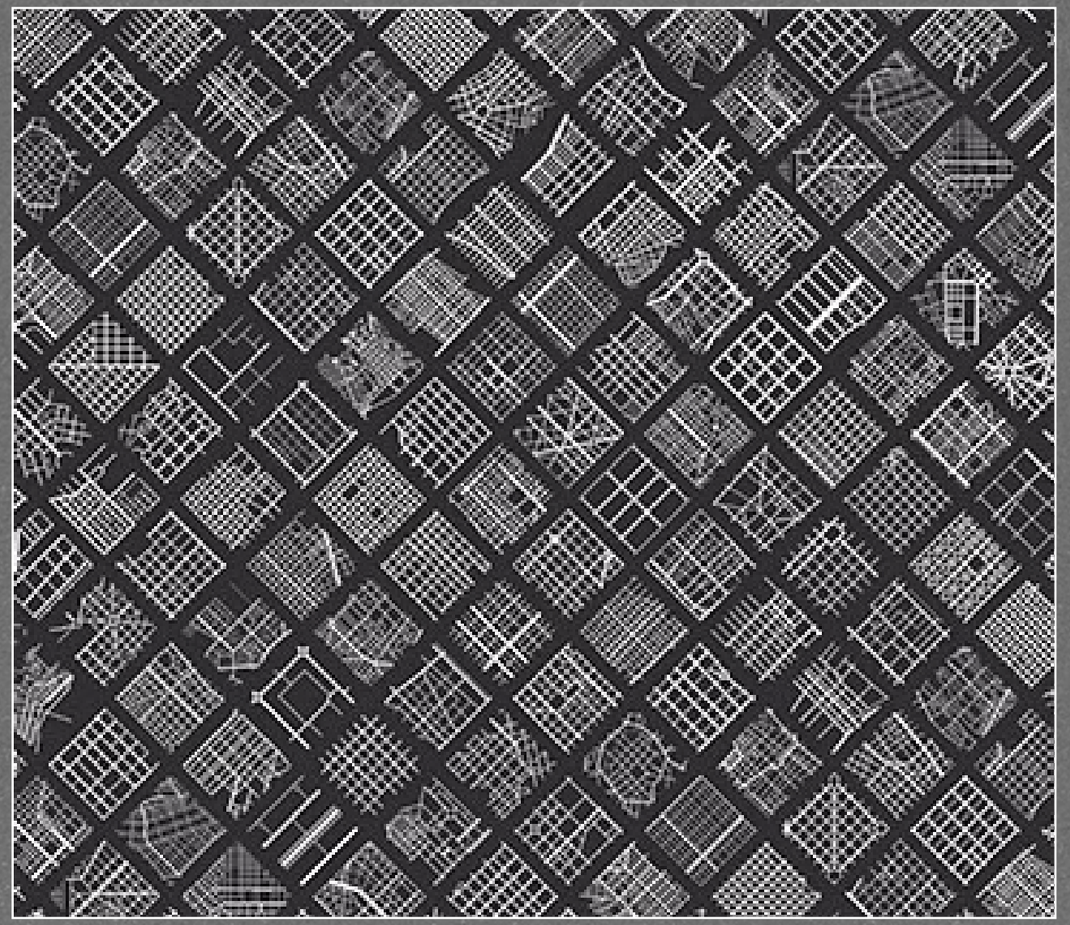
The physical design of a city is essentially a system by which complex, diverse, and often less of an entity can be ordered. It creates focus and meaning as well as convenience and ease of comprehension, and it is perhaps the letter necessities which have governed the persistence of the urban grid. This type of street layout, seen as early as the third millennium BC in ancient Egypt, recurring in hippo Damian Green planning, Roman imperial towns, the bas-tides of middle age, and persisting from the ideal plans of the Renaissance to 18th century classical planning to the industrial age, has become so much the hallmark of human settlement as a prompt one historian the questionable opinion that the chessboard principle points out the distinction between civilisation and barbarism.

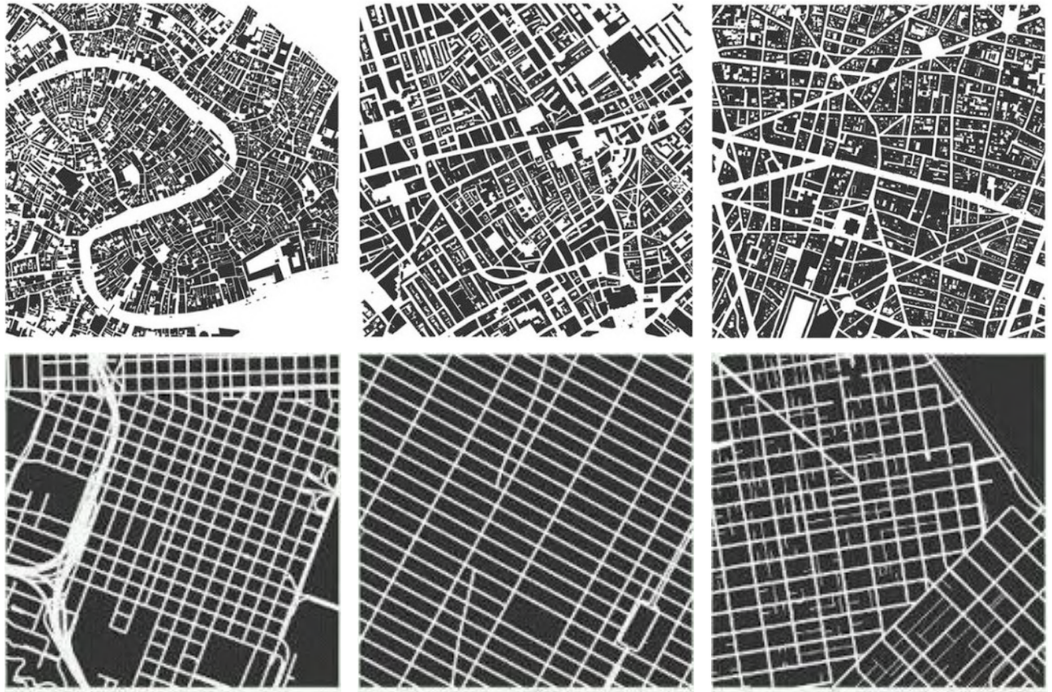
Although comprehensive planning has usually involved some sort of geometric ordering, a large part of urban growth has followed more irregular, organic patterns, sometimes specifically related to topography, sometimes simply the result of a process of gradual assertion. Often it is the major cities which have shown this pattern, while similar settlements have been more ordered, neither attendants nor Roman exhibited the overall geometric order scene in the professional towns of antiquity, nor did mediaeval Paris or London saw any of the rectilinearity of the bastide towns. More cities as they exist today represent a long and complex pattern of planning and growth overlaid with a series of recent adjustments, impositions, and alterations. The city is never static.

Since the 19th century the city has been viewed so many as essentially a "problem" to be "solved". Town planning is a crucial centre of all our problems. When modern town planning started to develop forty years ago one could never have imagined it would have such a future. The extent to which all human problems may be solved through town planning is, of course, questionable, yet it is perhaps inevitable that so much effort, idealism, and enthusiasm should centre around the planning of cities.

1.2 INTRODUCTION

The urban grid is one of the most enduring and versatile tools in the discipline of urbanism. Far beyond its apparent simplicity, the grid embodies a set of spatial rules that guide city development, shaping both physical form and social behaviour. This section explores the grid's foundational definition, its key characteristics, and the theoretical reflections surrounding it. It traces the evolution of the urban grid from a flexible open form to a structured model of city design, examining how its logic has allowed for long-term consolidation and adaptability. Additionally, the grid is studied not just as a planning device but as a symbolic language—reflecting the values, aspirations, and systems of the societies that produce it.





(Fig.1,2,3) Vector illustrations of cities **Venice, London and Paris** showcasing regular growth stems from a reflective urban vision, promoting organic growth shaped by topography and everyday needs often seen as 'Good City'

(Fig.4,5,6) Vector illustrations of cities **Portland, New York and San Francisco** showcasing regular grid system promoting a structured network shed by urban growth and requirements often seen as 'Planned City'

1.2.1 GRID IN THE DISCIPLINE OF URBANISM.

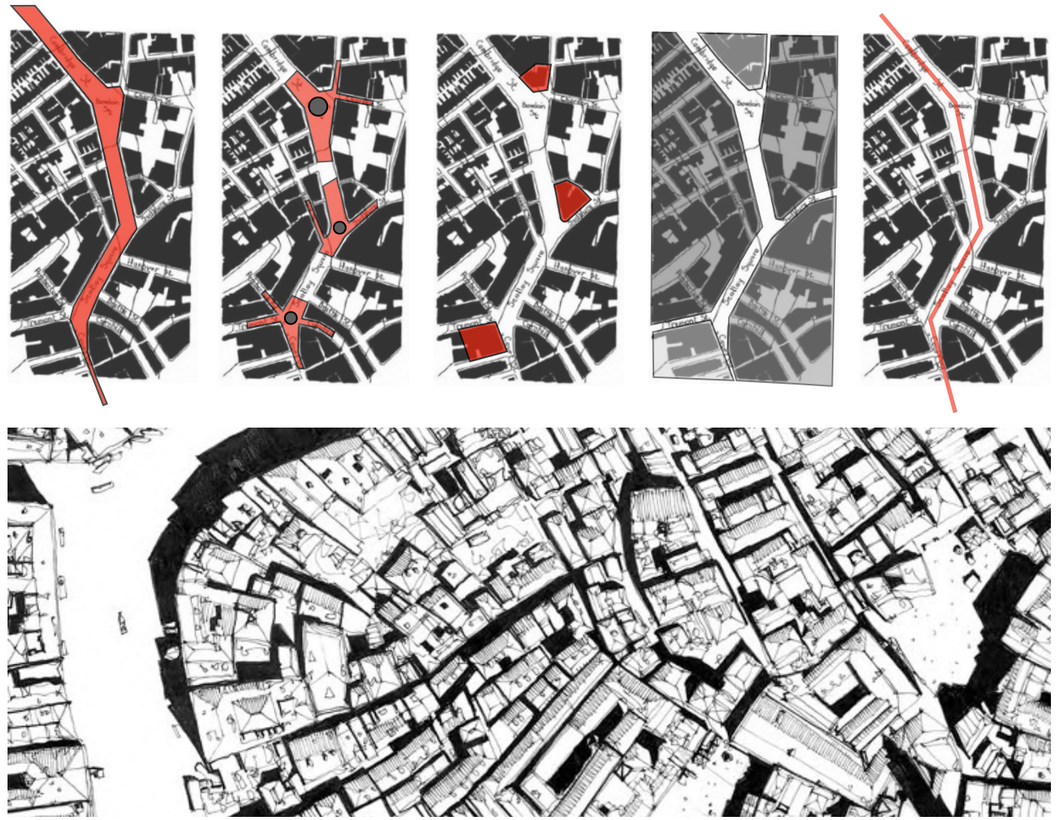
Grid cities appear across a wide range of urban contexts, though they have seldom been formally classified as a distinct typology, often being described merely in geographical terms that reference their layout. It is important to recognise that urban design is not only a discipline concerned with solving functional challenges but also possesses the potential to foster more efficient and equitable social structures. Positioned between urban planning and architecture, urban design operates across multiple scales; between the scale of the city and the district; between the greater landscape and public space; between the interpretation of general systems of infrastructure and the urban environment. In doing so, it wields significant influence over interventions in both urban and territorial settings, whether directly or indirectly.

1.2.2 DEFINITION, CHARACTERISTICS AND ELUCUBRATIONS.

Regular growth may be defined in relation to organic growth. The regular city responds to a well thought-out reflective project and an idea of the city for development, be it ambitious or practical. Organic growth , conversely, is produced by addition over time, in coherence with the topography of the place, for the purpose of channeling the everyday needs of a given society. Sometimes this type of organic growth has been proposed as the example of the “Good City”

This form of urbanism was strongly criticised by Le Corbusier, who portrayed it as the negative legacy of the past. He famously referred to it as "Donkey Urbanism," condemning it for its lack of vision, ambition, and structured planning.

The regular city is an apparently apprehensible, yet complex and unpredictable object. In a broad sense, it is a social object, but it is also technical, and it responds to an aesthetic will. Most of all, however, it has a form, which in many cases is repre



(Fig.7,8,9,10,11) Urban designer Keven Lynch's Five elements i.e Pathways, Nodes, Landmark structures, Districts and Natural dividers that generate Urban plan.

(Fig.12) Fragment of Venice showcasing that the regular cities not just allows repetition of architectural types but also regulates a series of urban actions which can be changed or adjusted according to social and technological norms.

sented by the plan. This condition is especially applicable in the cases of the gridded city.

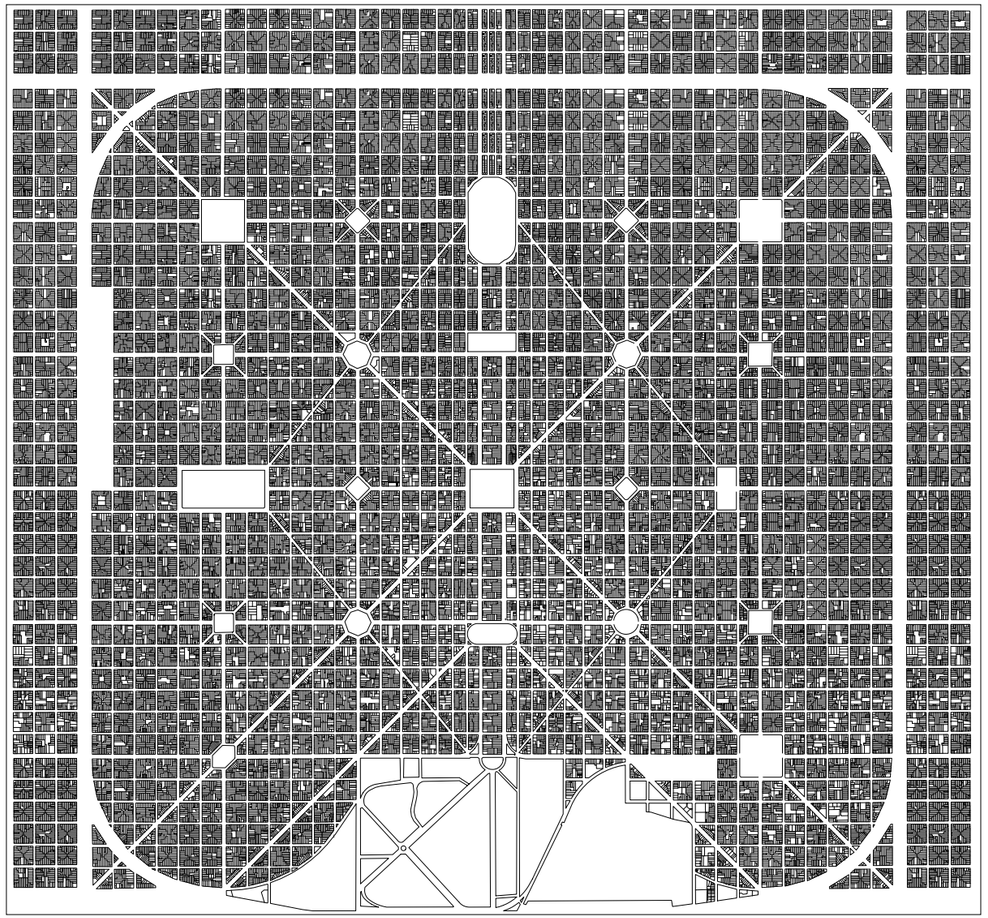
As Pierre Lavedan wrote in *Géographie des villes* (1936), whether the city is spontaneous or designed, the layout of the plan—particularly the design of its streets—is not the result of chance. There are rules that are followed, unconsciously in the former case or consciously in the latter; there are always elements that generate the plan. Likewise, the continuity of the layout is empirically verified, which leads to the formation of a 'law of persistence' of the plan.

The grid city is a common urban form in cities of very different cultures and time periods. Just as people define a social contract among themselves, accepting certain rules, cities, too, are built according to rules and conventions. Among them, the regular city is interesting in that it allows not just the repetition of a single object of the same architectural type, but also the regulation of a series of urban actions that can be adjusted and changed according to social and technological norms.

This urban form within the category of regular city goes by various names: grid, chessboard, matrix, reticulum, mesh, network, lattice, malla (in Spanish), etc. The space devoted to private buildings, on the other hand, has fewer synonyms, which are block, building cluster, îlot (in French), and manzana (in Spanish).

The definition of this category is important for its theory article and in instrumental importance as a space in between, as we have seen. In the 19th century, the materialisation of urbanisation was very appropriate. It was a term coined by Cerda in his *Teoria General de la Urbanizacion*, based on the latin root urbs when drawing a plan to extend the city across the Barcelona plan. His concept arose from the contrast with the country of the rural world.

One of the defining elements in the creation of grid cities in the design of the layout (figure X), which regulates the arrangement of buildings on the site and defines



(Fig.13) - Urban plan of city La Plata, Argentina as a perfect example showcasing that grid creates rules of formation and transformation to produce normal city and grid as a design tool helps to make the layout which define public spaces, infrastructures and marks out boundaries for buildings creating a system which also contains capacity for transformation in long term.

the form of public space, ensuring the interlinking of parts, but above all guaranteeing their future transformation.

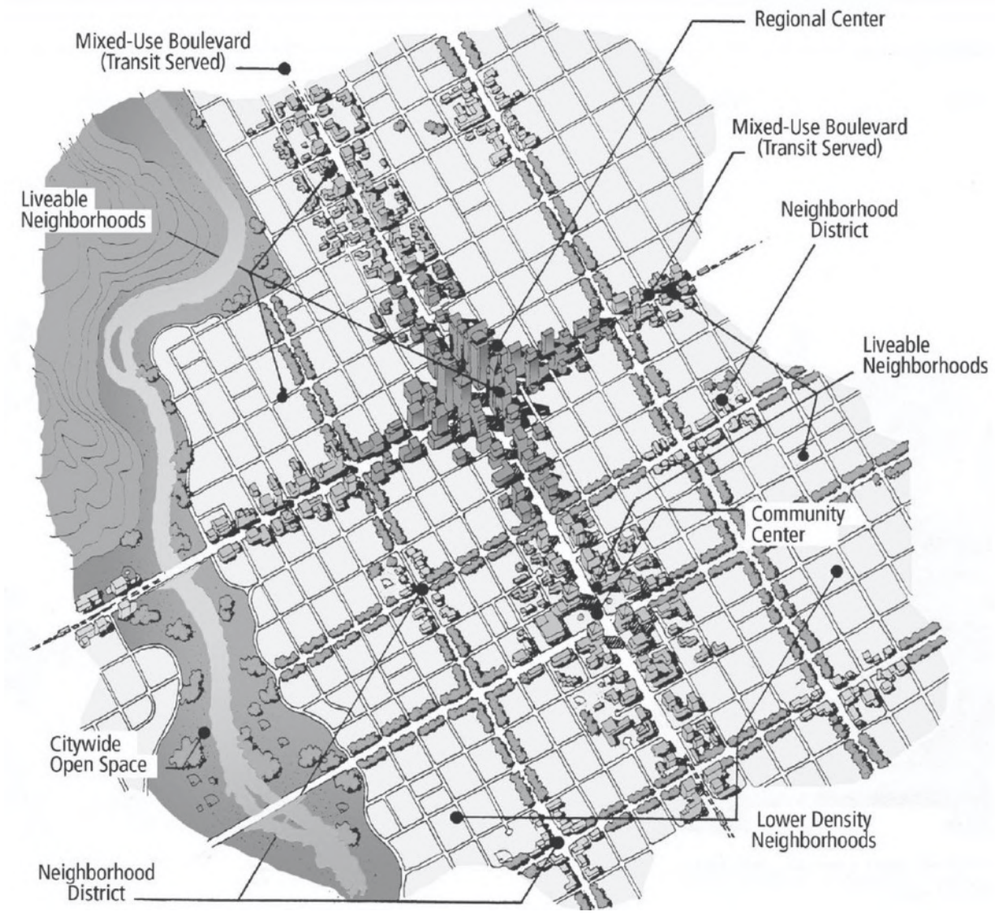
Throughout history, generations of various civilisations have recognise the capacity of certain devices, such as the grid cities, to maintain the cohesion of the urban organism in time, adapting and transforming without distortion when faced with partially unforeseen situations. This expression in the long-term shows an evolution in the idea of regularity and a very different use of each element of the city project.

The grid creates rules of formation and transformation to produce the normal city (figure X). With the term infra-ordinary (1989), Georges Perec reminds us that newspapers write about every thing except normal things. Something similar occurs with buildings in the city. Most buildings and urban rules, like the regularity of the grade, are ordinary and, therefore, in conspiracies, leading to the limitation of artistic and architectural criticism. These two disciplines are able only to talk about the extraordinary, forgetting what affects most of the population.

Among the tools of the grid, particular mention should be made of the layout that establishes public space and infrastructures, and marks out the boundaries of the building on the ground (figure X). But also contains the capacity for transformation in the long term. This is the basic structure that makes the grid an open form.

The logic of the urban grid precedes specific grid design upgrade may be triangular or rectangular, but whatever its particular design, it remains a grid as long as it maintains its independent internal logic.

According to Aldo Rossi in the architecture of the city (1966), a city's logic in sometimes thought to be transcendent, always related to the origins of the above form.



(Fig.14) - From open form to city design an example showcasing Citywide growth which is encouraged along transit-served regional centers, community centers, neighbourhood districts, and corridors and this type of city layout is often associated with the expression of power, it allows encounter between different people highlighting "physical interaction is as important as social exchange."

1.2.3 URBAN GRID: FROM OPEN FORM TO CITY DESIGN

The grid is a mechanism that achieves order, as Le Corbusier explains in urbanisme. "In the midst of chaotic nature, man for his own security creates a place, zone of protection, in harmony with what he is and what he thinks; he needs landmarks, fortified places inside needs to feel safe.. the further human works move from direct 'prehension', the more they tend to put geometry.. free, men tends to pure geometry. He then makes what he calls 'order'".

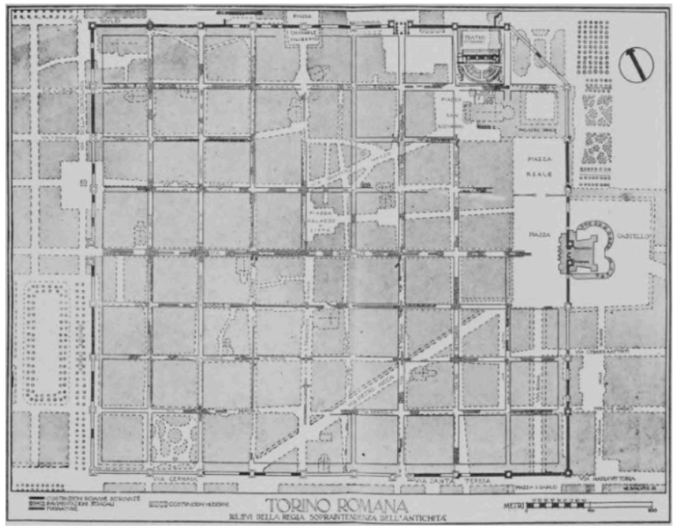
The grid is difference plus encounter. The grid in the city layout is often associated with the expression of power, which, in some cases, it has been. However, we realised that the grid allows encounter between different people; physical interaction is as important as social exchange.

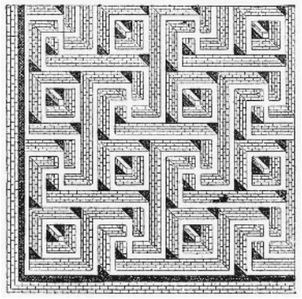
Man is a classifying animal; in keeping with his expressions, he or she tries to order according to the scientific method, by classes and types. Aristotle told us that categories are not created, whether they're found in nature, by means of a process of induction and intellectual intuition.

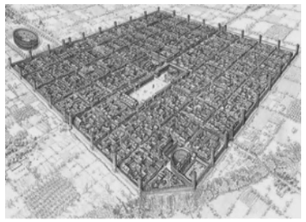
The idea of continuity in time to explain evolution is present in most fields, but with a different meaning the regular city is resilient, but it evolves, in different ways and for different reasons than the evolution of French pieces, in the evolution of city design social and institutional components can play an important role like dynamic or transformative effects produced by major conflict or war.

The history of ideas in turn explains that there are systems of polarities that serve to advance knowledge. There are four principal elements in the West fire, air, water and earth as opposed to five in China: wood, fire, water, metal, and earth.

Likewise, we can identify many types of grid cities, which ultimately fall into two opposing blocks; the minimalist versus the culturally advanced project; overall







(Fig.15) Plan of a **Roman walled city Torino**. An example for Romans organises the cities as military camps using grid system.

(Fig.16) Plan of a **Roman walled city Torino**. An example for Romans organises the cities as military camps using grid system.

(Fig.17,18) Roman **floor mosaic of late Republican**, showcasing a fret-maze in projection and **Torino city Ariel view** .

project versus fragment; classic versus innovation; and integrative versus independent, among others.

In general, rules and regulations tend to be seen as negative or limiting, as they hinder an understanding of the proposals and the desired result of the project.

In similar way, we can speak of the principles of exclusion, such as the absence of ornament in functionalism or the absence of symmetry in abstract expressionism, as positive values.

In this respect, positive movements such as functionalism in the 20th century offered different ways of building the city, but at the time it was the rejection of ornamentation that unified many options, since ornament is not functional, a position that unified many times. Ultimately, more specific definitions would be restrictive.

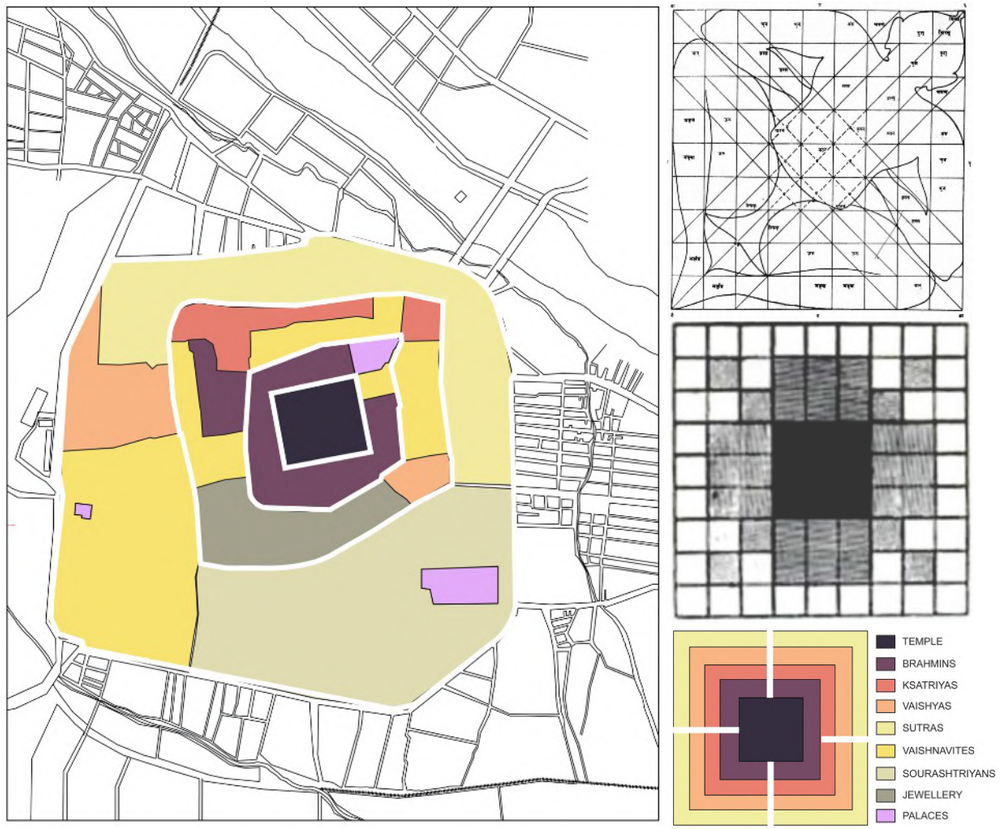
1.2.4 CONSOLIDATION OF GRID CITY IN LONG-TERM

we might ask whether the regular city is always a new creation. In general, yes, but not always. It is often the result of the superposition of a new system on an organic, or disordered, system. Does regularity means repetition? Rather than repetition, it means the regulation of certain urban events, regularisation of form, and so on.should regularity be absolute? It is almost never total and perfect it is almost never a perfect object, instead offering a multitude of variations, or derivatives.

The reasons for regularity or variable. Examples are rarely complete even in extreme situations like Versailles, we discover irregularities in implanted system.

1.2.5 THE CITY HAS A PRODUCT OF SYMBOLS

Grid cities prior to the mediaeval period respond to the implementation of an external symbolic or cosmological logic to justify their layout, often as ceremonial places where sacred power is concentrated. However, the consistency of formal or



(Fig.19) Madurai, India. This old city is a planned settlement based on ancient town planning principles of **Shilpasatra** also based on cast and occupational hierarchy, as four concentric squares with Meenakshi Amman temple in the center.

(Fig.20,21,22) Above **Vastu Purusha Mandala**, with the figure of Purusha outlined in the grid. **(21)**: A variation of an 81 square mandala. A representation of the cosmos that has been used for for the layout of temples and cities. **(22)**: Legend.

practical questions is almost as important as the symbolic, which might lead us to think about decisions that materialise relatively independently of the ideology that follows the narrative of the time, tending to explain the city as a reproduction of the universe.

For example the oldest cities respond to cosmological order, relating the layout to gods, the cosmos, et cetera the best examples are in China and India. China influences Korea and Japan and with Xi'an, Kyoto, and Beijing as good examples.

Indian texts on city planning include the Mansara Shilpa shastras, which told how the Earth can be parcelled out and the evil forces of Chaos are closed and controlled. The typical form was a mandala, a set of enclosing rings divided into squares. Urban tradition goes back to 2500 BCE, one of its most remarkable examples being Madurai in India (figure X), full of symbolism at different scales, the temple is the centre of the city.

The Romans organise the city as a military camp, using the techniques outlined in chapter to the force of its symbolism is well explained in required seminal investigations 1970.

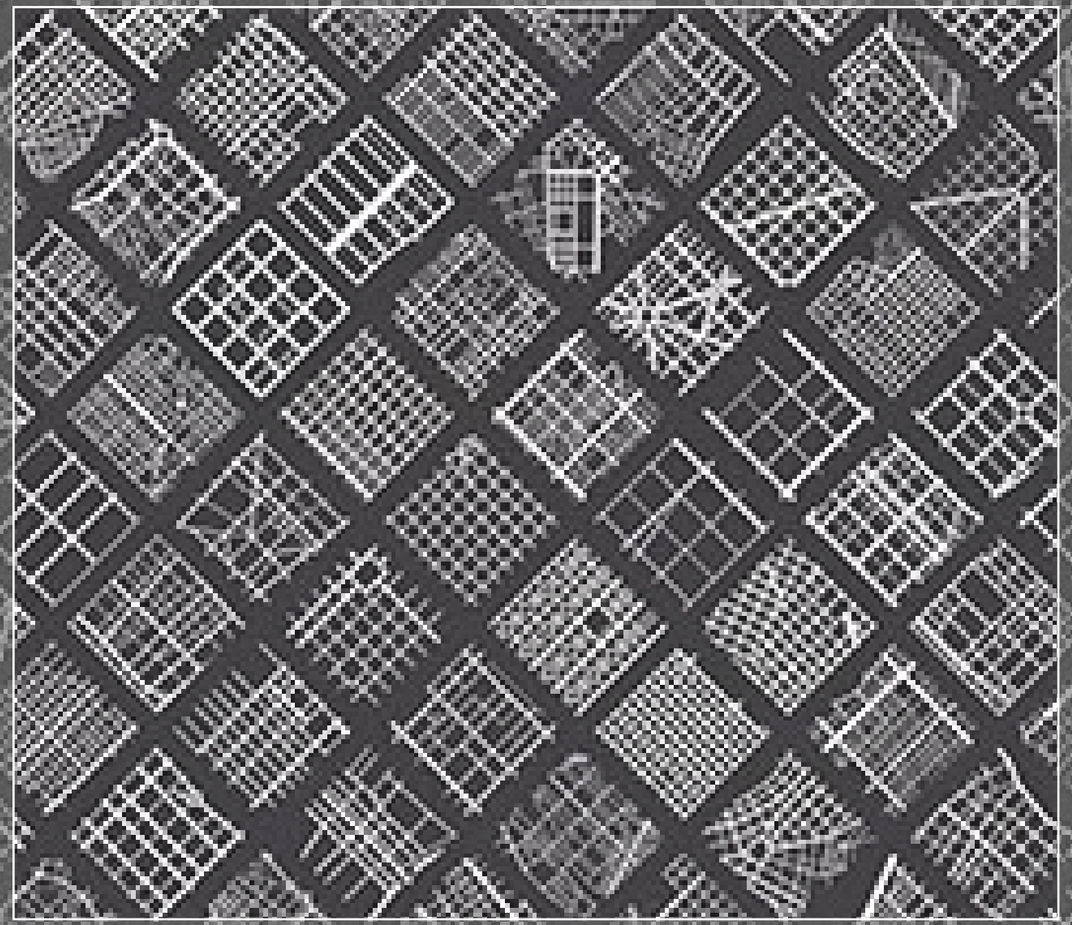
1.2.6 THE GRID CITY AS A SYSTEM

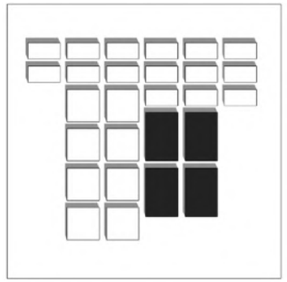
The grid is not actually a singular form invented by a designer in the Beaus art tradition it is a system created to act over time, and to ensure coherent urban production and guarantee its process of implementation. The regular city is the product of the creation that is not always either unitary or complete.

This definition of the grid city as a system allows us to understand that, in many cases the original project passes through different states that will materialise the initial idea urban form, activities etc.there are many intermediate states, such as the capacity to extend outwards, like Chandigarh, India.

1.3 DECODING GRID

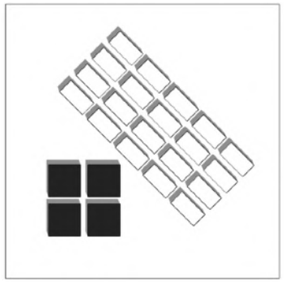
Urban grid cities can be categorized into six distinct types, each reflecting a unique spatial logic and historical context. The **Accumulative City** grows through the addition of modular parts, while the **Continuous City** extends seamlessly over territory with repetitive patterns. The **Cellular City** is formed by self-contained units, each functioning like a miniature city. The **Overlay City** introduces new grids over existing structures, creating complex spatial layers. The **Infinite City** is based on the idea of limitless expansion, and the **Scalar City** operates across different scales, from the building block to the regional plan. Together, these types reveal the adaptability of the grid across time, space, and cultural conditions.





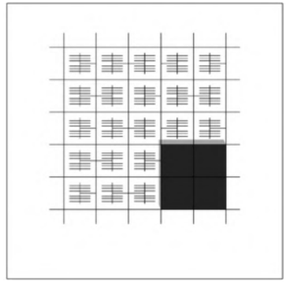
THE ACCUMULATIVE CITY

The “Accumulative Grid City” consist of the juxtaposition of different grids through time. Often initially designed as area enclosed by walls, as in the case of Turin, Marseille, and Berlin, a succession of grades or incrementally added to form a coherent, well-connected city characterised by a contiguity of urban fabric under varied continuity of the cities spatial field.



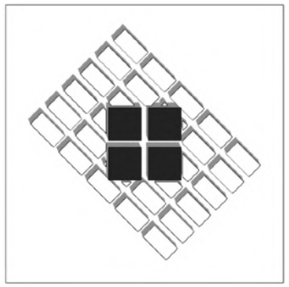
THE DISCONTINUOUS CITY

The “Discontinuous Grid City” consist of a series of city fragments executed as independent urban projects, specially distinct but connected by a secondary grade or a network of avenues.each fragment is structured to respond to well defined programmes as well as variations in the underlying topography, forming neighbourhoods with a singular identity. Examples of the discontinuous grid city include Lisbon, Tokyo and Algiers.



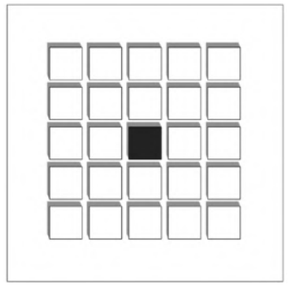
THE CELLULAR CITY

The “Cellular Grid City” is formed by the aggregation of complex urban units, ourselves, that are organised in a respective manner. Larger in scale then the typical block, the cell is typically embedded within a maxi grid of primary roadways and may contain certain urban functions internally, as in the cases of Chandigarh, Abu Dhabi, and Milton Keynes.historic examples of the cellular grid city includes the ward plan of Savannah.



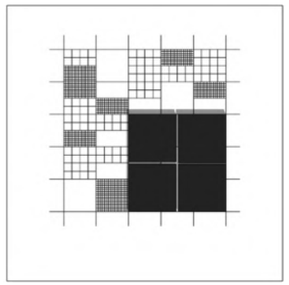
THE OVERLAY CITY

The “Overlay Grid City” is formed through the composition and superimposition of different urban frameworks with different hierarchies. The outcome is often achieved through the overlay of a network of diagonal boulevards over the orthogonal grid of the regular city as in the cases of Barcelona and other cases involves the superposition of a new order over existing urban frameworks as in Rome and Paris.



THE INFINITE CITY

The “Infinite Grid City” consist of the regular repetition and extension of a foundational grade.this is typically evident in Latin America colonial cities following the loss of the Indies, such as Buenos Aires and Guadalajara as well the many North American cities designed on regular, repeated grids, such as Kansas City, Salt lake city and Portland.

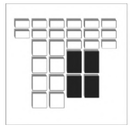


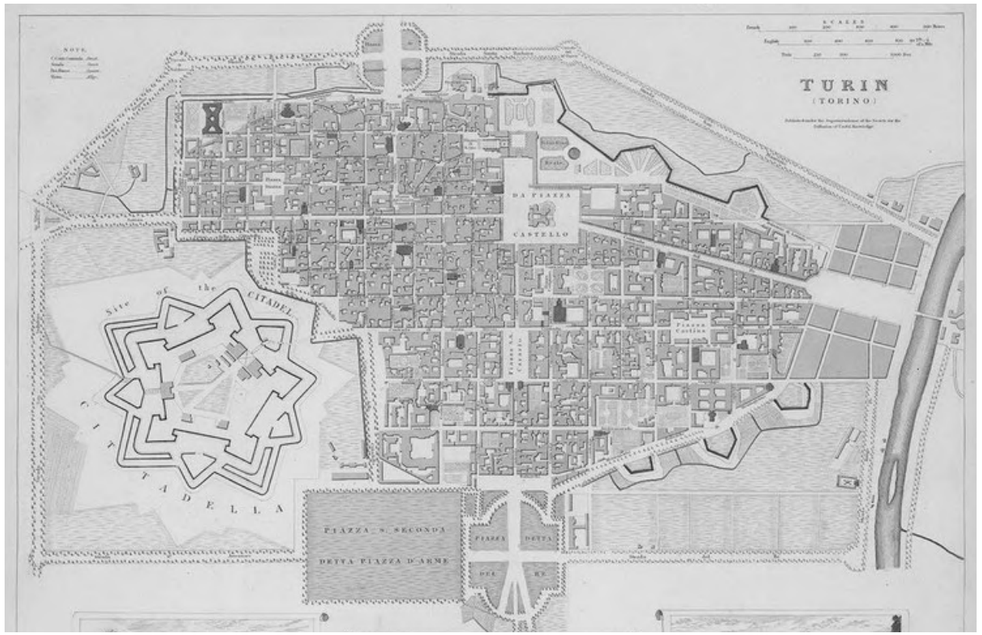
THE SCALAR CITY

The “Scalar Grid City” reflects the scalability of the great as a tool in the city design. It may be formed through a clear hierarchy between the individual elements of the grid, or it may develop through a logic that extends from the territorial arrangement of land to the organisation of blocks. Examples include historic cities such as Xi’an and Jaipur, as well as cities develop in the past century in response to new traffic demands, such as Taipie and Seoul. The scalar city is also seen in the expansion of American cities across the territorial Jefferson grid.

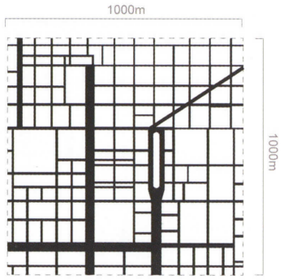
1.3.1 TURIN, ITALY

Founded as a Roman military campaign 26 BCE, Turin is characterised by an accumulation of distant grids and cohesive building morphology throughout its long history. The grid of Roman city remains legible today, providing orientation and anchor to subsequent urban expansion projects, notably the comprehensive planning under the house of Savoy in the 17th century and urban architectural works of Philipose Juvarra. While the geometry9 of the block where is across the district, a cohesive urban character is maintained through a regular fabric of courtyard buildings and loggia Arcades.

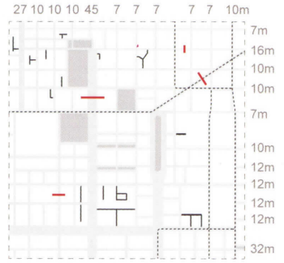




(Fig.23) Old Map of Turin - The grid city of Romans.

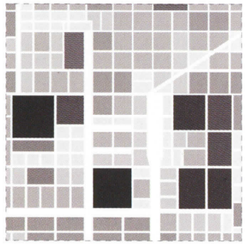


Primary Grid



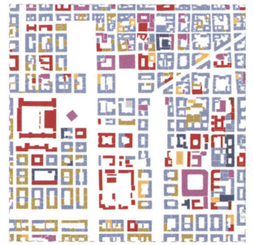
Secondary Grid

45° 04' N



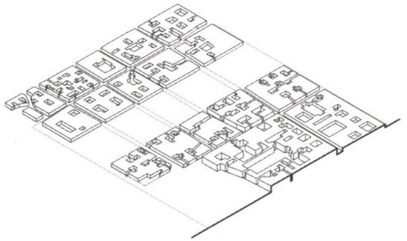
Block Dimension

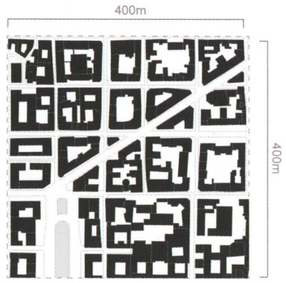
-3000m² -8000m² -15,000m²
-4500m² -10,000m² -20,000m²
-6000m² -12,500m² -30,000m²



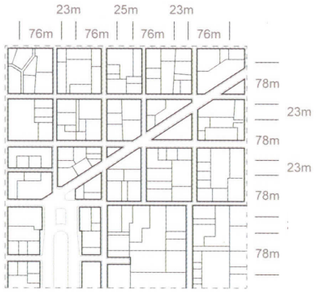
Program

High-Rise Res. Institutional
Residential Hotel
Mixed-Use Cultural / Religious
Comm. / Office Parking

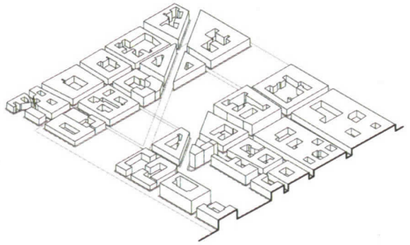




Building Footprints

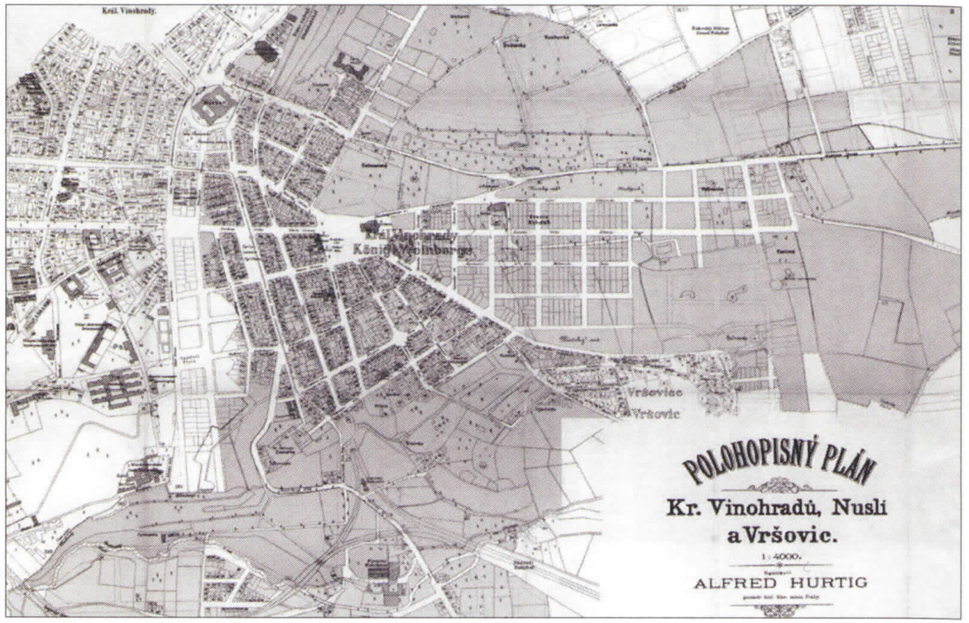


Parcellation

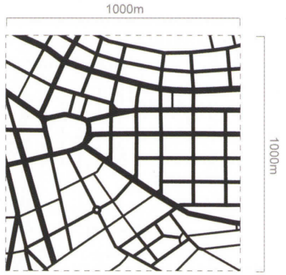


1.3.2 PRAGUE, CZECH REPUBLIC

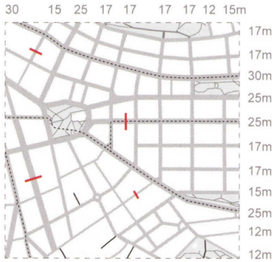
The historic Kaurava Prague preserve the structure of a succession of urban developments from the early mediaeval period until today.The Great was first introduced in the 1348 layout of Nove Mesto under Charles IV, a large city expansion consisting of 27 m wide avenues and large market squares that become Centre for economic and political activity.late 19th century city districts, such as Vinohardy, developed as discontinuous grade plans aligned to existing communicating lines, characterised by perimeter block typologies and significant public spaces at intersections of mass transit.



(Fig.24) Old Map of Prague, Czech Republic



Primary Grid



Secondary Grid

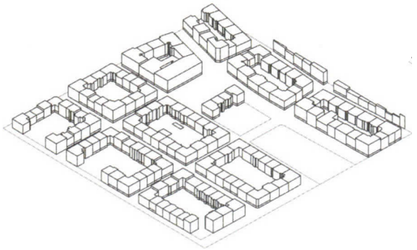
50° 05' N

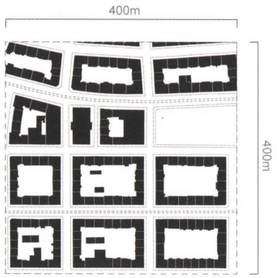
Block Dimension

-2500m² -10,000m² -17,500m²
-5000m² -12,500m² -20,000m²
-7500m² -15,000m² -30,000m²

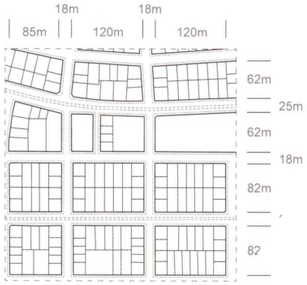
Program

Residential Institutional
Mixed Use Hotel
Service Cultural / Religious
Office

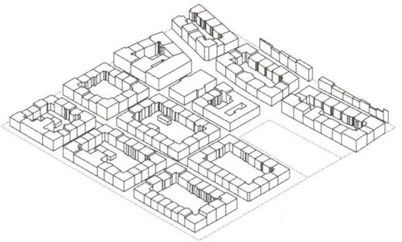




Building Footprints

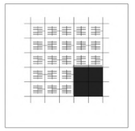


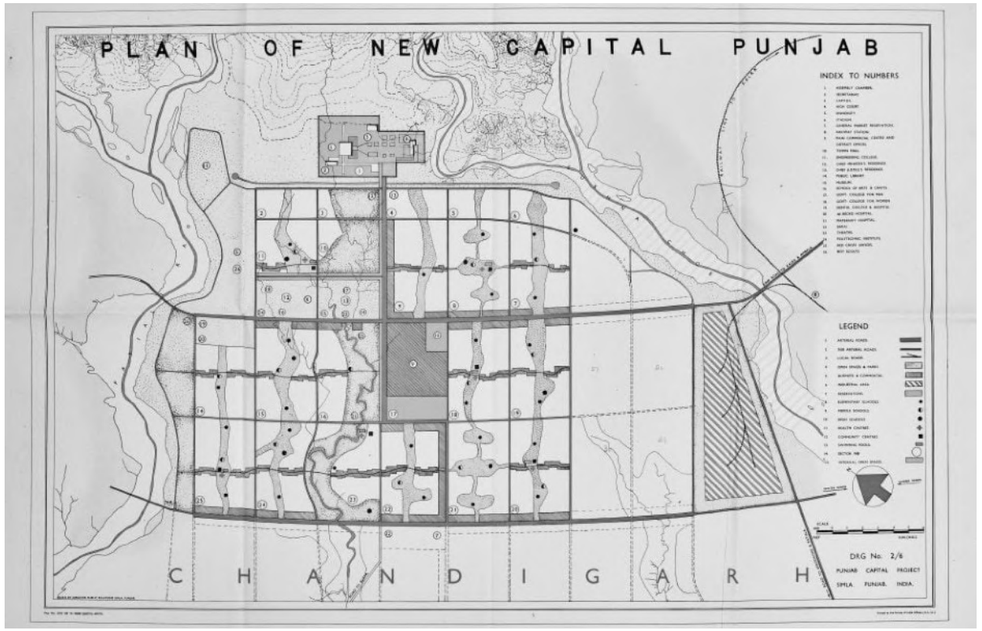
Parcellation



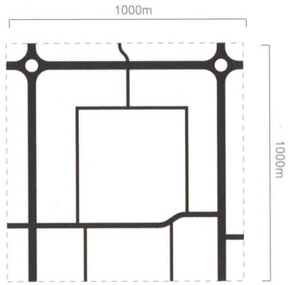
1.3.3 CHANDIGARH, INDIA

The cellular grade structure of Chandigarh, developed from 1951 by the office of Le Corbuiser following the earlier planning efforts of Albert mayor is composed of a regular hierarchy of streets (“Vs”) and open space corridor underlying a grade of cells measuring approximately 1 by 1.6 km.urban functions are organised at the scale of the cell as well as the scale of the large grid, as seen in the designation of an entire cell for civic and commercial functions. Symbolic capital functions or concentrated in a single area. At the Northern terminus of leisure Valley, between the city and mountains beyond.

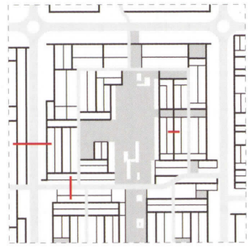




(Fig.25) Old Map of Chandigarh, India by Architect Le Corbusier.



Primary Grid



Secondary Grid

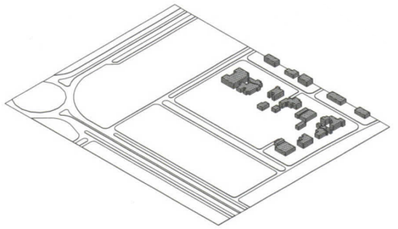
30° 45’ N

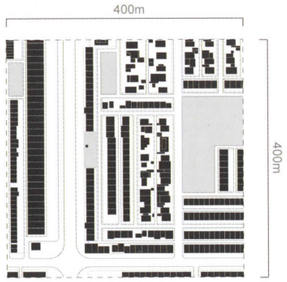
Block Dimension

-2500m² -10,000m² -17,500m²
-5000m² -12,500m² -20,000m²
-7500m² -15,000m² -22,500m²

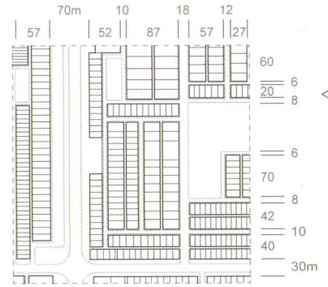
Program

Mixed Use - Res. Office
Mixed Use - Com. Hotel
Institutional Surface Parking
Market / Rec. Park / Plaza

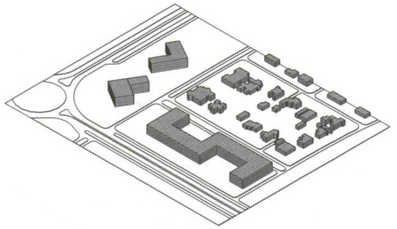




Building Footprints

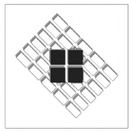


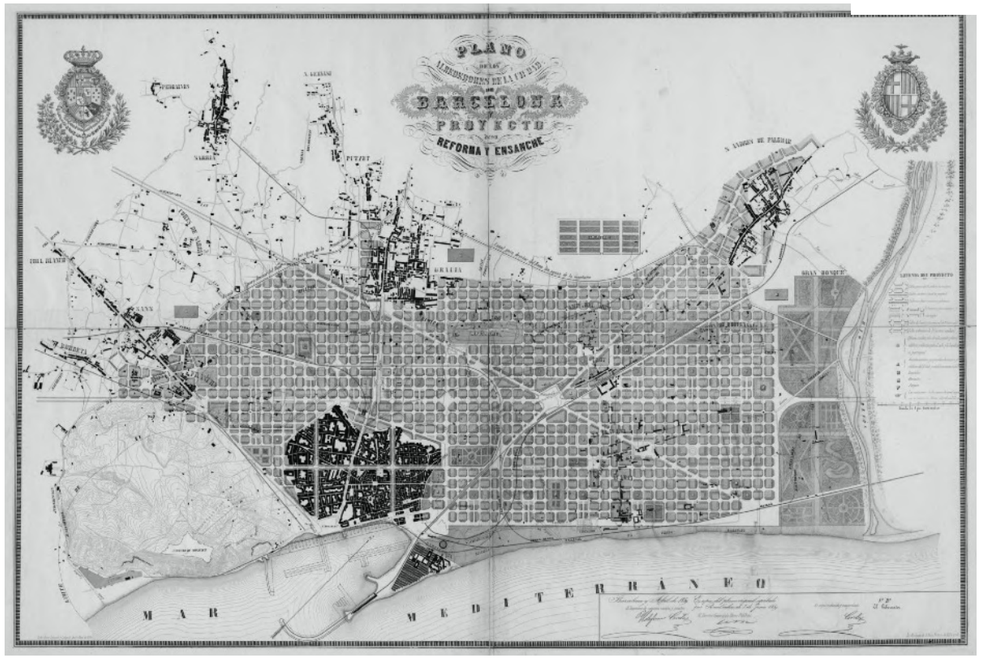
Parcellation



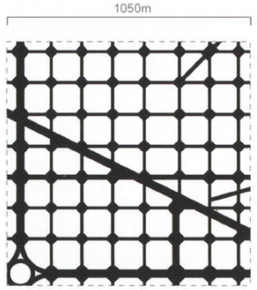
1.3.4 BARCELONA, SPAIN

Barcelona is characterised by the overlay of Ildefons Cerda's Eixample grid plan across former agricultural lands surrounding the historic, Ciutat Vella from 1859. The plan is comprised of 520 regular blocks, or isles, interrupted by key diagonal avenues, and establishes a regularity and compactness of urban form that continues to characterise the city. Today the Eixample is understood as one of many grids defining contemporary Barcelona. A diverse set ranging from the fragmented grids of Gracia and sant Andreu to maxi-grids of Zona Franca.

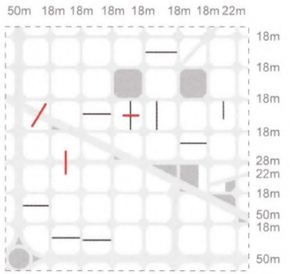




(Fig.26) Ildefons Cerda's EXIAMPLE - Master Plan of the City Barcelona, Spain.



Primary Grid

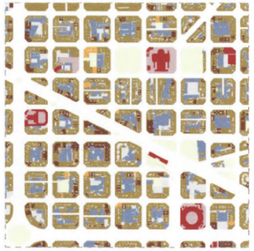


Secondary Grid

41° 23' N

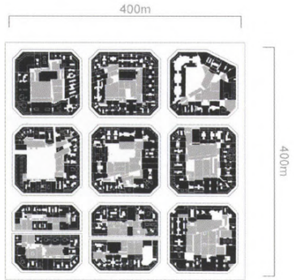
Block Dimension

-2500m² -5000m² -7500m² -10,000m²
-11,000m² -12,000m² -13,000m² -14,000m²
-15,000m² -16,000m² -17,000m²

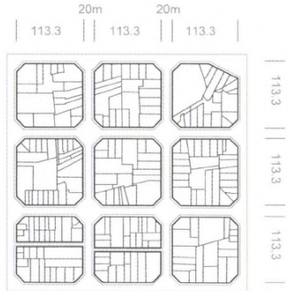


Program

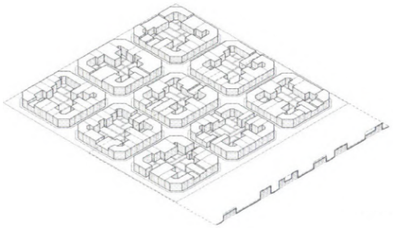
Mixed Use
Ind. / Service
Institutional
High-Rise Res.
Hotel
Open Space

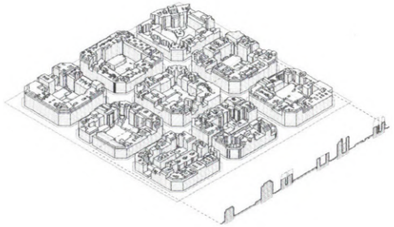


Building Footprints



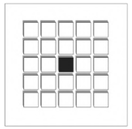
Parcellation

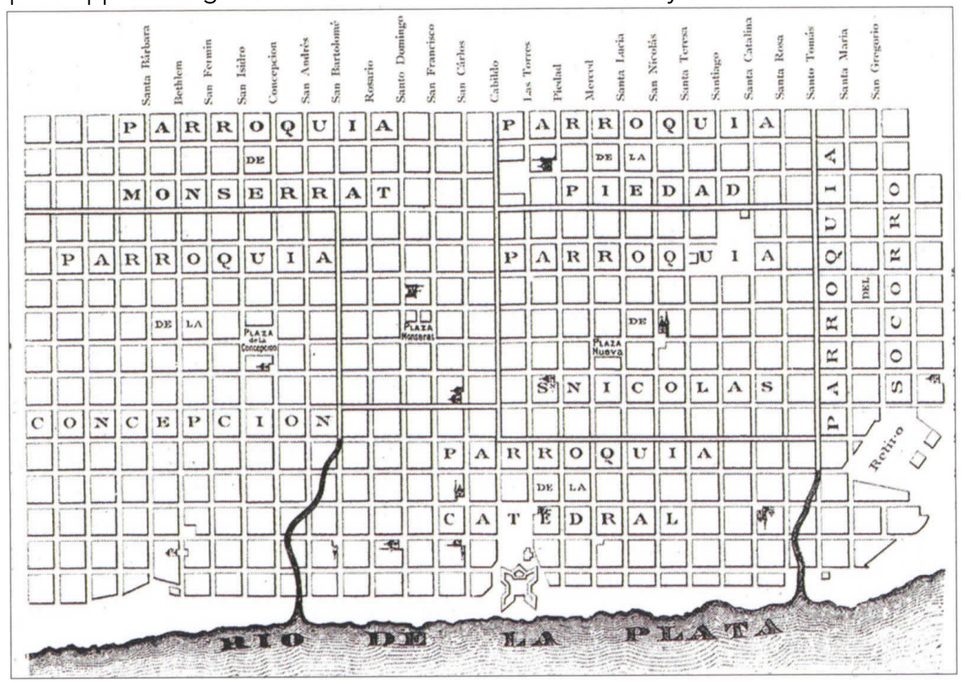




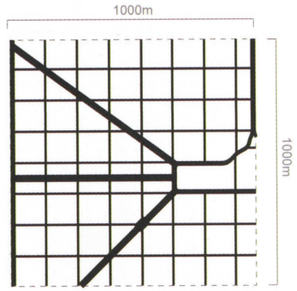
1.3.5 BUENOS AIRES, ARGENTINA

Established in 1580 and Rio de la Plata, Buenos Aires is characterised by the infinite grid and regular manzana blocks of 110 m squares. Across the pattern of same block repeated without differentiation or hierarchy, large infrastructural pieces began to be inserted into the city through the synthesis or removal of several blocks, notably through the construction of the 9 de Julio Avenue in 1816. The typical block of Buenos Aires is completely built out, with larger pockets of green space approaching the further one moves out from the city centre.

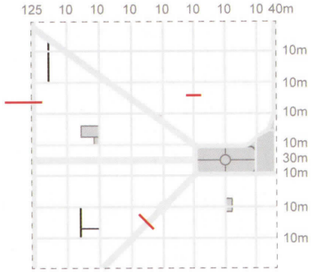




(Fig.27) Grid map of Buenos Aires (Rio de la plata), Argentina.

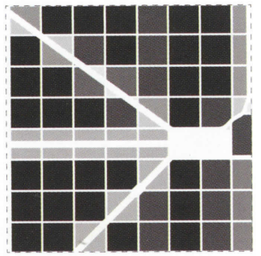


Primary Grid

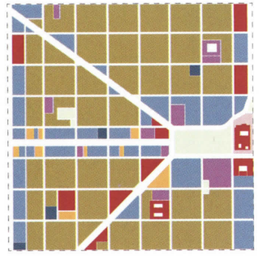


Secondary Grid

34° 36' S



Block Dimension



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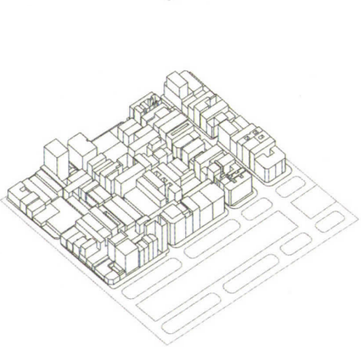
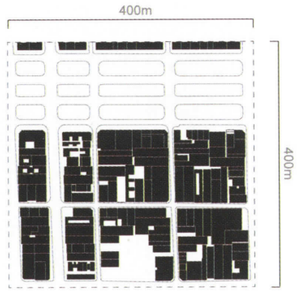
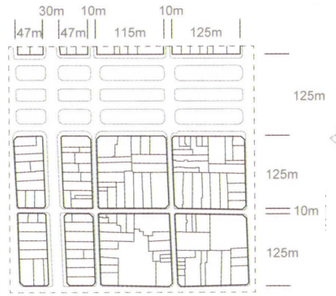




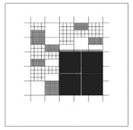
Building Footprints

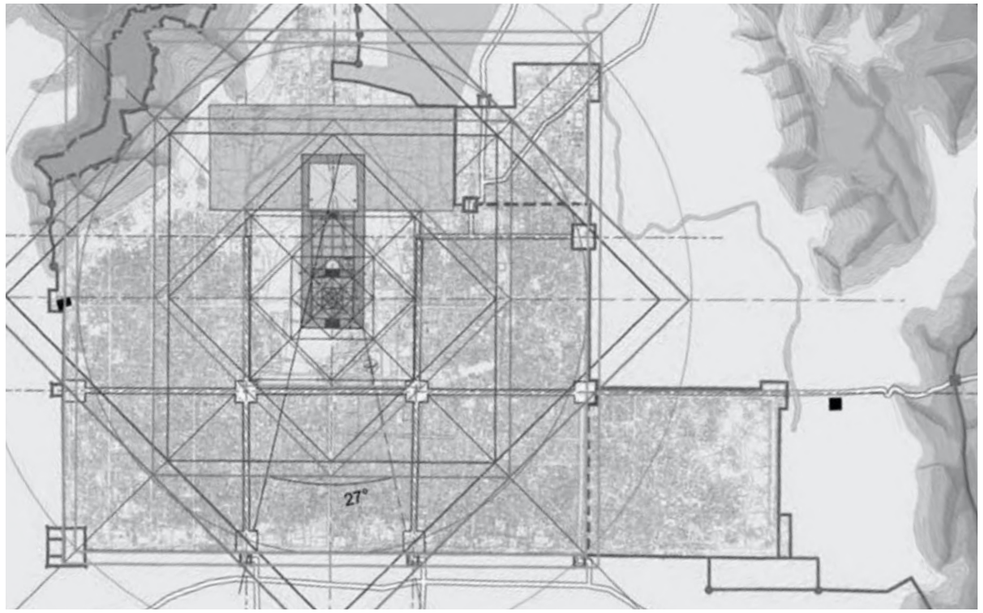


Parcellation

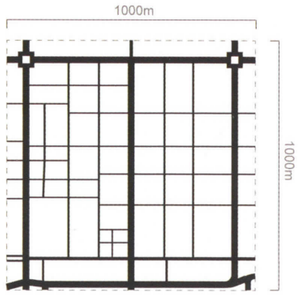
1.3.6 JAIPUR, INDIA

And early major planned city in India, Jaipur was founded as the new capital of Rajasthan by Jai Singh IIA in 1722, laid out by Vidyadhar Bhattacharya on this spatial principles of Vastu shastra.the Citicorp presents a unique scaler organisation, whereby broad 30 m avenues lined by covered bazaars meet at large intersections, Chowk, defining a grade of nine sections of 1 km². Two sections are designated for state functions, one is disciplined to the South East due to accommodate the sites topography and each section is further subdivided and supplemental grid of narrow secondary and territory streets, originally joined by trade.





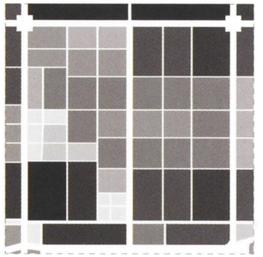
(Fig.28) 9 Square grid planning of an Indian city Jaipur planned based on the principles of Vastu Shastra.



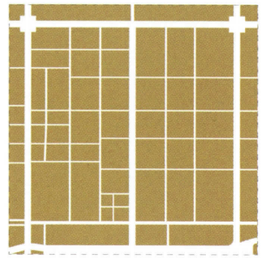
Primary Grid

Secondary Grid

26° 56' N



Block Dimension



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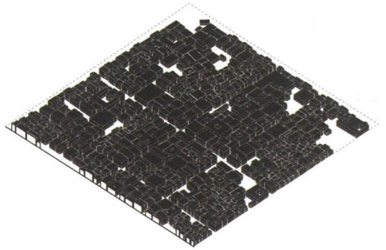
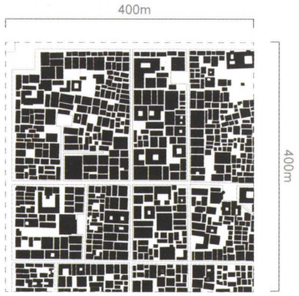
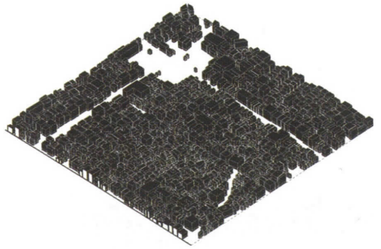




Building Footprints

Parcellation



CONCLUSION

In exploring the concept of urban grids, this chapter provides a comprehensive framework for understanding how city planning is inherently tied to notions of order, function, and symbolism. Drawing from ancient grids of Mesopotamia and Rome through Renaissance orthogonal planning and early industrial expansions, we observe how grids have served as a visible language for urban civilisation—tools for organising movement, hierarchy, open space, and societal values. As history unfolded, the grid evolved into different typologies—accumulative, continuous, cellular, overlay, infinite, and scalar cities—each expressing distinctions in logic, scalability, and adaptation across diverse geographical and cultural contexts.

Importantly, the chapter establishes key conceptual dimensions, including the shift from open form to formal urban design, the long-term consolidation of grid cities, and the symbolic dimension of the city as a societal statement. These ideas inform how grids function not only as physical systems but also as carriers of civic identity and collective aspiration.

As a foundation, this chapter sets the stage for deeper inquiry into two emblematic grid cities in subsequent chapters. **Chapter 2** will examine **Barcelona's Eixample**, where Ildefons Cerdà's innovative grid—with its octagonal blocks, wide streets, chamfered corners for visibility, and integrated green spaces—became a pioneering model for hygienic, equitable urban expansion **Chapter 3** will turn to **Chandigarh**, whose modernist grid and sectorial structure reflect the ideals of Le Corbusier and early Indian modernity. Chandigarh's careful road hierarchy (the '7Vs'), modular sectors of 800×1,200m, and abundant green space embody a spatial analogy to a living organism—head, heart, lungs, limbs, and circulatory system—all functioning in intentional harmon.

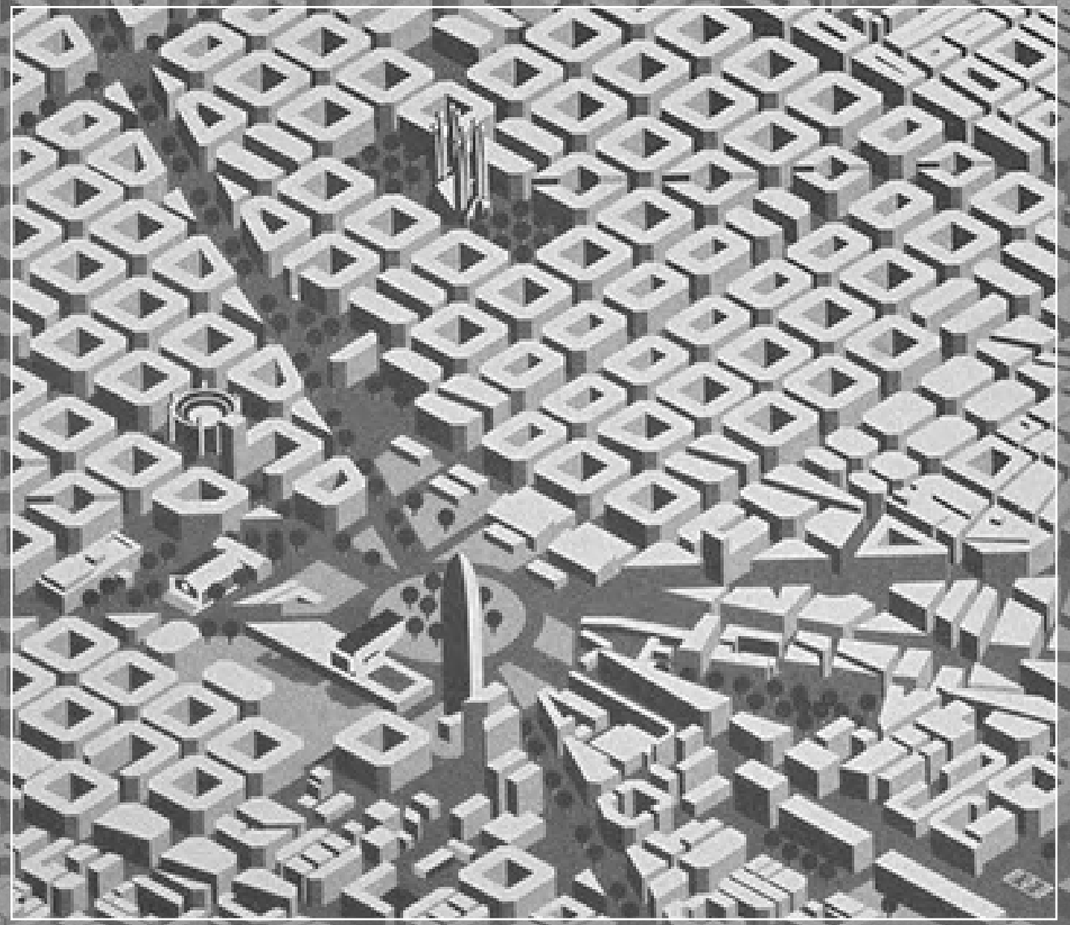
Together, these chapters will illuminate how grid planning has been adapted across contexts—from Barcelona's 19th–century response to urban health and mobility challenges, to Chandigarh's mid-20th–century expression of civic identity and modern governance. This comparative analysis provides the theoretical and empirical insights necessary to inform later chapters, including the minimalist architectural study and the eventual design proposal for Amaravati.

Through this layered approach, Chapter1 generates a conceptual foundation that bridges typology, theory, and symbolism. It lays the groundwork for an exploration of urban planning that is both historically informed and future-forward—a foundation from which subsequent chapters will draw detailed lessons and applications.

Chapter 2 : URBAN STUDY 1

BARCELONA

In this chapter,Barcelona is studied as a prime example of grid-based urban planning, with a focus on Ildefons Cerdà's groundbreaking *Eixample* plan from the 19th century. Faced with the problems of overcrowding, poor sanitation, and industrial growth, Cerdà envisioned a new kind of city—one that prioritized public health, social equality, and efficient mobility. His rational grid was marked by uniform blocks, broad streets, chamfered corners, and integrated green spaces, all designed to improve the quality of urban life. The chapter examines how Cerdà's vision challenged the traditional city and laid the foundation for a modern, humane urbanism. By analyzing the logic, design, and long-term impact of the Eixample, this study highlights Barcelona's significance in the history and theory of urban grids.



(Fig.29) Georges-Eugène Haussmann, commonly known as Baron Haussmann, was a French official who served as prefect of Seine (1853–1870), chosen by Emperor Napoleon III to carry out a massive urban renewal programme of new boulevards, parks and public works in Paris commonly referred to as Haussmann's renovation of Paris

(Fig.30) Ildefons Cerdà Sunyer was a Spanish urban planner and civil engineer who designed the 19th-century "extension" of Barcelona called the "EIXAMPLE". Because of his extensive theoretical and practical work, he is considered the founder of modern town planning as a discipline, having coined the word "urbanization"

3. MODERN TOWN PLANNING

3.1 ORIGINS OF MODERN TOWN PLANNING

The origins of large-scale urban improvements in industrial Europe is often linked to the works of **Georges Haussmann, Prefect of the Seine from 1853 to 1870,** and **Ildefons Cerdà, the Catalan engineer who planned Barcelona's expansion in 1859.** Haussmann, a **determined and strategic administrator,** reshaped Paris by introducing a network of **wide boulevards** that connected key urban hubs like **railway stations and markets** what he termed **'nodes of relation.'** His transformation involved **demolishing old neighbourhoods** to create **spacious streets, public squares, modern sanitation systems, gas lighting, and efficient public transport.** Additionally, he established **major parks on the city's eastern and western edges** and developed essential **public infrastructure, including schools, hospitals, and administrative buildings.** Haussmann's approach was **revolutionary** in its reliance on **extensive topographic surveys** and a **holistic vision of the city as an interconnected system,** but the **social and environmental costs** of his ambitious restructuring **remain a topic of debate.**

Cerdà was more ambitious than Haussmann, with a **broader and more detailed approach to urban planning.** While Haussmann focused on **topographic improvements,** Cerdà conducted **extensive surveys covering social, demographic, housing, economic, public health, and environmental factors.** He envisioned a city **designed for future mechanized mass transit,** incorporating **multi-level transportation interchanges and rail networks.** His plan **extended Barcelona beyond its demolished city walls,** transforming **agricultural land into a structured urban grid** with **integrated public spaces in each block.** Cerdà's vision included **essential infrastructure—parks, plazas, sidewalks, gardens, hospitals, markets, roads, railways, water supply, sewerage, and storm drainage.** Unlike Haussmann,

(Fig.31) Street Painting of then Plaza Sebastian, Barcelona 1869. Before Expansion

(Fig.32,33) Paintings of Barcelona's city walls being demolished for Expansion.

his proposals were **guided by a systematic and empirical theory of urbanization,** making his approach **not just practical but deeply rooted in research and long-term sustainability.**

Cerdà's plan and theory, influenced by Chadwick's sanitary ideas and Haussmann's urban transformations, laid the foundation for modern city planning. His approach was **rooted in detailed social and environmental surveys,** with a **strong focus on infrastructure.** What truly set **Cerdà apart** was not just his **vision** but his **ability to navigate political challenges** to bring it to life. He combined a **forward-thinking urban model** with **technical expertise and strategic execution.** His understanding of cities as **interconnected "systems" and "networks," with both spatial and temporal dimensions,** established him as a **true pioneer in urban planning.**

BARCELONA IN TWENTIETH CENTURY

Barcelona currently operates **without an officially adopted city plan.** However, the **Pla Territorial Metropolità de Barcelona,** approved by the **Generalitat de Catalunya on April 20, 2010,** serves as the **guiding framework,** replacing the **1976 Plan General Metropolitano,** which had shaped the city's growth for decades. **Both plans, particularly the new metropolitan plan, acknowledge Cerdà's vision** by structuring urban space as **interconnected networks, incorporating green spaces and infrastructure** to create a **balanced metropolitan environment.**

Like **Cerdà's original plan,** they are based on **detailed spatial analyses and theoretical foundations.** The **lasting impact** of Cerdà's work lies in the **sense of cohesion and order** it instilled in **Barcelona's urban fabric,** providing a **framework for sustainable expansion.** His **structured grid** not only **transformed rural farmland into a functional cityscape** but also ensured a **resilient model for future urban**

(Fig.34) Barcelona in 20th Century, a satellite image of the city.

development, a legacy that remains evident **both from an aerial perspective and at street level.**

Barcelona today is a **dense and vibrant city,** home to **1.62 million people** within an area of **101 km²,** resulting in an **average density of 15,990 persons per km².** It serves as the **core of a polycentric metropolitan region** with **five million inhabitants** spread across **3,200 km².** The city boasts some of the **Mediterranean's largest ports and airports,** reinforcing its **economic significance.**

Despite the **economic crisis** that has particularly affected **Barcelona and Spain,** the city has experienced a **prolonged period of prosperity,** largely fueled by the **preparations for the 1992 Olympics.** This **transformation, spanning from 1982 to 2007,** marked a **golden era for Barcelona,** elevating its status as an **economic and cultural hub.**

The **lasting impact of Cerdà's urban vision** remains evident throughout the city, celebrated through **numerous exhibitions and publications** that marked the **150th anniversary of his plan in 2009–2010,** under the **Cerdà Year initiative** led by the **City and Province of Barcelona.**

UNDERSTANDING THE MAN AND THE CITY

To understand the **significance of Cerdà's Expansion Plan** and his **theory of urbanization,** it is essential to understand both **the man and the city he sought to reshape. Ildefons Cerdà i Sunyer** was born in **1815** on his **family estate near Centelles,** a rural town in **Catalunya, approximately 50 km from Barcelona.**

He earned his **civil engineering degree in 1841,** and his first biographer, **Miguel Angelón,** described him as an **"algebraic man"** with an unwavering belief in **rationalism.** This mindset, deeply rooted in **logic and order,** was shaped by his **engineering education in Madrid from 1835 to 1841,** as well as **earlier studies in mathematics, architecture, and drawing** in **Barcelona from 1832 to 1835.**

(Fig.35) Map of Barcelona and it's neighbourhood villages before expansion

(Fig.36) Map of Barcelona, a small settlement founded by Romans called as **Barcino.**

His intellectual approach aligned with the **progressive thinkers of the 19th century,** an era defined by **rapid advancements in science, technology, and rationalism.**

He was hardly **"only" an engineer,** even a **visionary and versatile one.** He also served as an **elected politician and provincial legislator** in the **Diputación de Barcelona from 1871 to 1874** during the **First Republic of Spain,** even reaching the position of **Vice President.**

In addition, he developed **building and zoning regulations** to implement his plan, carried out **statistical and scientific studies** to support its provisions, and wrote several **theoretical works on urbanization, city construction, and rural development.** In his time and beyond, he was **widely recognized as a genius.**

BARCELONA BEFORE EXPANSION

Barcelona, the second-largest city in Spain, traces its origins back to the **Romans,** who founded a small settlement called **Barcino around 100 BC.** During the reign of **Caesar Augustus,** Barcino evolved into a **fortified castrum,** with a **central forum and a grid of perpendicular streets.**

By the early **14th century,** urban expansion led to the development of **El Raval, west of La Rambla,** prompting the construction of **defensive walls in three phases.** Initially, the fortifications enclosed only the **Barri Gòtic and El Born.** The **second phase** extended protection to **El Raval,** though it remained separated by the earlier walls. Finally, the **third phase** strengthened the **southern boundary, directly linking the city to the port.**

This fortification **defined the limits of Ciutat Vella until the late 19th century, shaping the historic core of Barcelona.**

(Fig.37,38,39) Density of persons per dwelling in Barcelona (1859).
Average values on the first floor, Second floor and third floor

(Fig.40,41,42) Mortality rate (per 1000) in Barcelona (1856-1865).
Average values on the first floor, Second floor and third floor

REASON TO EXPAND THE CITY

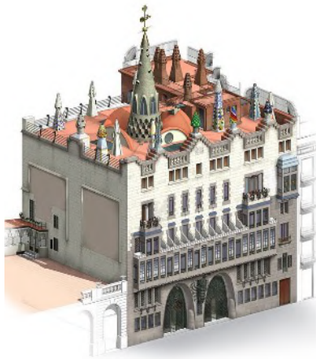
In the **mid-19th century,** Barcelona faced **severe urban challenges,** with a population of **190,000 (1860)** crammed into just **4.5 km²** in the historic center, resulting in an **extreme density of approximately 42,000 persons/km²**—nearly **double the present-day density of 24,800 in Ciutat Vella (Old City).**

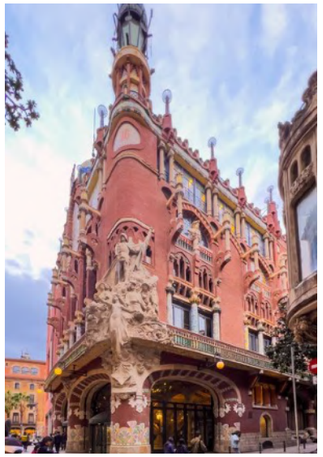
This **overcrowding,** combined with **poor ventilation, lack of sunlight,** and **unsanitary conditions,** led to **frequent outbreaks of cholera and other epidemics.**

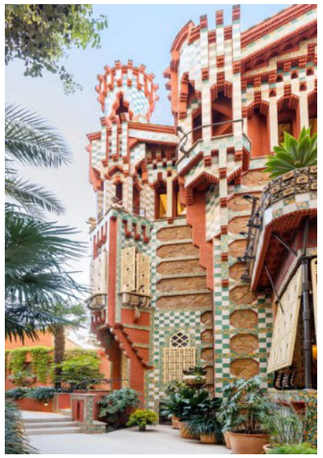
To address these issues, **Ildefons Cerdà** embarked on an **exhaustive study** of **working-class living conditions,** conducting **extensive surveys across social classes.** He meticulously analyzed **housing interiors, ventilation patterns,** and the relationship between **street width and airflow,** as well as **building height and sunlight penetration.** His findings revealed **stark disparities**: while he believed a **minimum of 6.0 m³ of space per person** was necessary for a **healthy life,** the **working class had access to just 0.9 m³ per person.** This **severe spatial deficit** led to **high mortality rates** and an overall **decline in public health.**

Cerdà's solution was bold, an **ambitious expansion of the city,** designed to **relieve congestion, improve sanitation,** and accommodate both **housing and industry** in response to the **rapid urbanization** brought about by the **Industrial Revolution.** His ideas were crystallized in his **seminal 1867 book, *Teoría General de la Urbanización* (General Theory of Urbanisation),** in which he **laid the foundation for modern city planning.**

His vision centered on a city that **prioritized public health,** integrating **infrastructure, green spaces,** and a **well-planned street network** to ensure a **liveable and sustainable urban environment.**







(Fig.43,44,45) Casa Batlló and Palau Güell by Antoni Gaudi, **Palau de la Música Catalana** by Lluís Domènech their works ensured a consistent urban fabric.

(Fig.46,47,48) Casa Milà by Antoni Gaudi, **Casa Amatller** by Josep Puig I Cadafalch, **Casa Vicens** by Antoni Gaudi are few famous works ensured a consistent urban fabric.

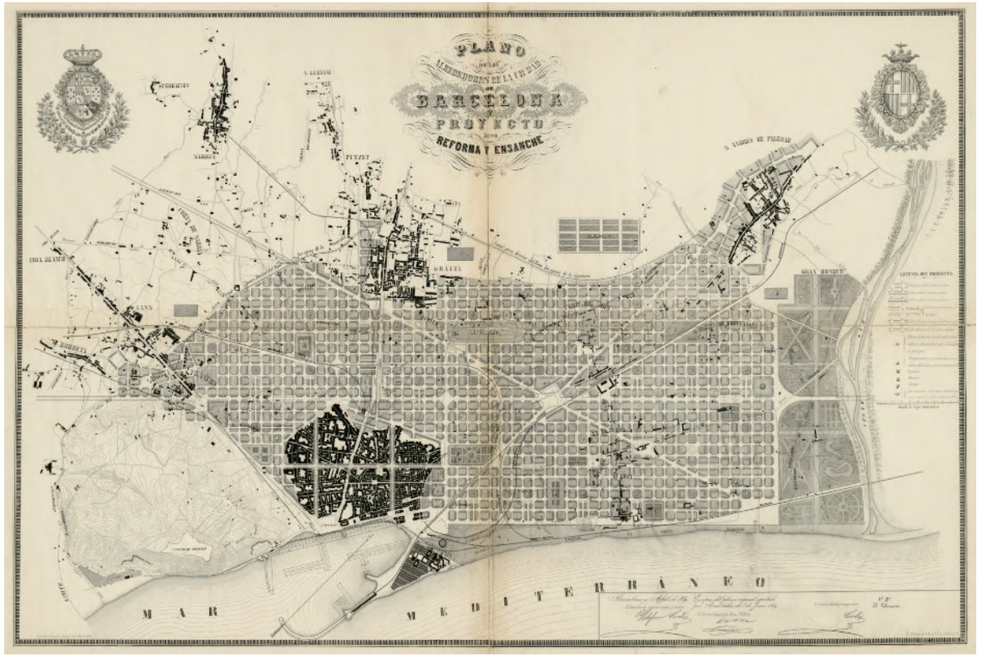
"EIXAMPLE" - THE EXTENSION OF ILDEFONS CERDÀ

The **extension plan of Ildefons Cerdà,** combined with the **explosion of Modernisme** at the turn of the 20th century, remains one of the **defining features of Barcelona's urban identity.** The **Eixample (Expansion) district,** shaped by **Cerdà's rational grid,** provided a framework within which some of the city's most **iconic architects—Antoni Gaudí, Lluís Domènech i Montaner, Josep Jujol,** and **Josep Puig i Cadafalch**—created **architectural masterpieces.** Their works, adhering to the strict height regulations of the period, ensured a consistent urban fabric where buildings presented a harmonious street façade, concealing the remarkably high residential densities behind them.

By **2009, the Eixample had an average density of 35,000 inhabitants/km², ** with some neighbourhoods **nearly doubling this figure.** Notably, these densities **equaled or even surpassed those of the old city (Ciutat Vella)** before the **demolition of the medieval walls between 1854 and 1856**—a period marked by **severe overcrowding and unsanitary living conditions.**

However, **unlike the squalor of the pre-modern city,** the **Eixample achieved these densities while maintaining a high quality of life,** demonstrating the **success of Cerdà's vision.** His design incorporated **wide, tree-lined streets, chamfered intersections to improve visibility and airflow,** and a balance of **residential, commercial, and public spaces.**

The **Eixample remains one of the most desirable districts in Barcelona,** known for its **liveability and architectural grandeur.** However, challenges such as **traffic congestion and noise pollution persist,** a consequence of the **automobile-oriented urban evolution of the 20th century.** Despite these modern issues, **Cerdà's plan continues to prove its resilience,** offering a **structured yet adaptable urban framework** that supports both **historical preservation and contemporary urban life.**



(Fig.49) Historical map of Barcelona (1860) designed by Ildefons Cerdà, a revolutionary urban expansion project which introduced a distinctive grid-like structure with wide streets and chamfered corners on blocks (Intervia's - term coined by Ildefons Cerdà) and provision for green spaces, aiming to create a human cantered design.

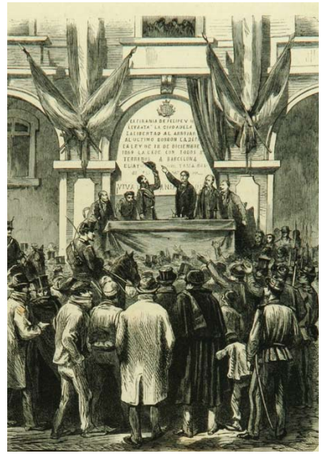
TIMELINE OF BARCELONA'S EIXAMPLE.

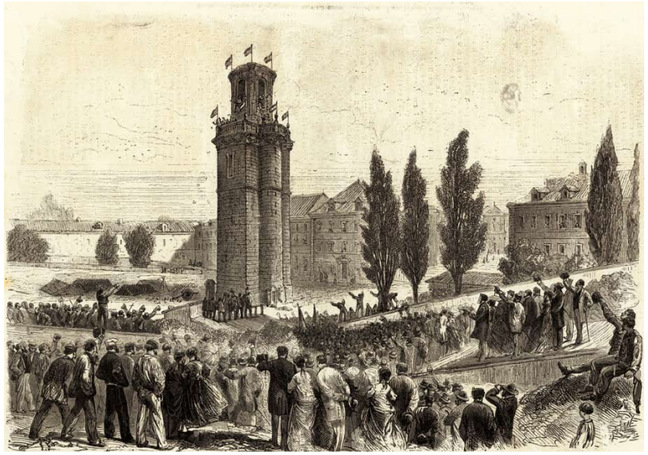
Cerdà's **1859 expansion plan** for Barcelona strategically structured the **space between the historic city and its surrounding towns** (Figure X). The **need for expansion** had become inevitable due to two interconnected factors: **the Industrial Revolution**, which fueled rapid urban growth, and the **worsening overcrowding and disease** within the confines of the old city. These conditions underscored the urgency for a **modern, structured urban expansion**, ultimately shaping Barcelona's transformation into a **more livable and efficient metropolis**.

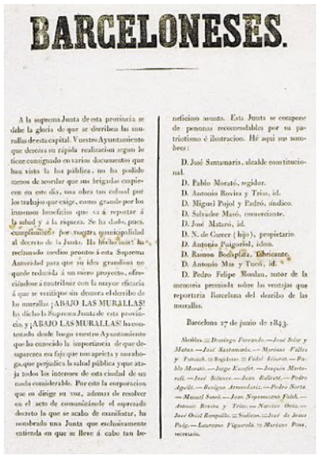
1. The Foundations of Expansion

In **1843**, **Ildefons Cerdà** was appointed **head of the Barcelona District** within the **General Direction of Public Works** under the national government. His work spanned **roads, telegraphs, canals, and Barcelona's port**, laying the groundwork for his later urban planning initiatives. During this period, Barcelona's **gas and water infrastructure** also developed, with **La Catalana de Gas (1848)** and **Companyia d'Aigües de Barcelona (1860s)** shaping essential networks, influenced by **French engineering and finance**.

At the same time, **Haussmann's urban reforms** in Paris provided a model for large-scale urban transformation. The arrival of **Spain's first steam train** in **1848**, connecting **Barcelona and Mataró**, further emphasized the city's growing industrialization and need for expansion. By **1854**, Cerdà had taken on a new role as an **engineer for the Ministry of Finance** in Barcelona, alongside serving as a **city councillor**. These positions allowed him to conduct **detailed statistical studies** on **society, economy, and public health**, forming the empirical foundation for his **visionary expansion plan** for Barcelona.







(Fig.50) Ceremony of the handing over La Ciutadella to the city of Barcelona (1869).
(Fig.51) Ceremony marking the beginning of the demolition of the citadel by agreement of the Provisional Revolutionary Council (1868).

(Fig.52,53,54) The publication of Abajo las Murallas!!! (Tear Down the Walls!) in 1841 by Pedro Monlau. A crucial movement that paved the way for city's expansion. **(54)** Official notice for demolition of walls.

2. Breaking down the Medieval city walls

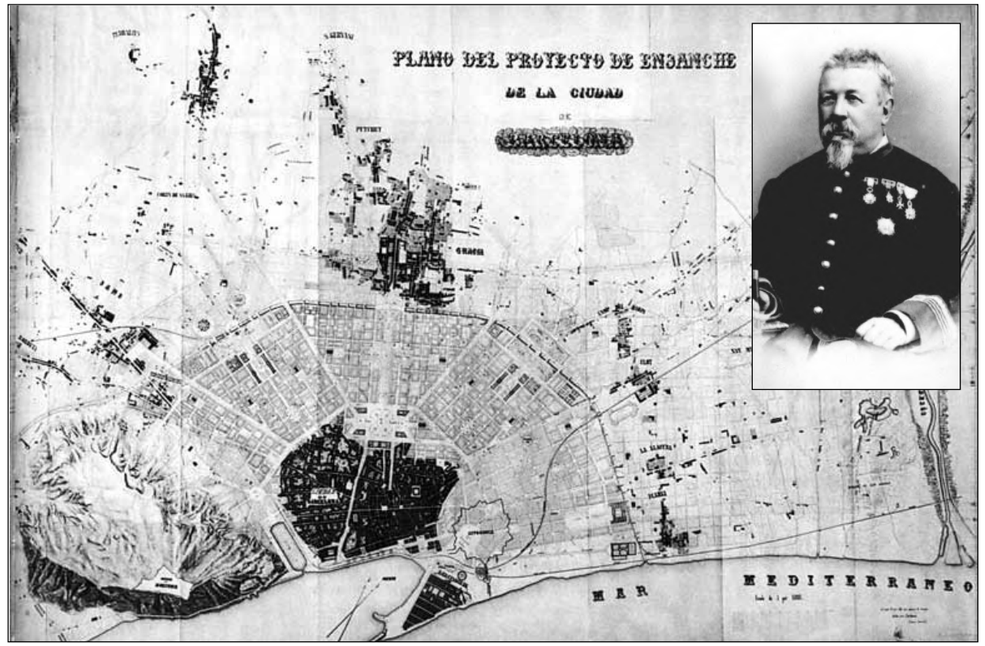
A **crucial moment** that paved the way for **Cerdà's expansion** was the **removal of Barcelona's medieval city walls.** This process was set into motion by the publication of **Abajo las Murallas!!! (Tear Down the Walls!)** in **1841 by Pedro Monlau.** The booklet, which won a **city-sponsored competition,** sparked a **15-year debate,** culminating in the walls' **complete demolition by the end of 1856.** The **removal of these walls** physically and symbolically **opened the city for expansion,** addressing the **suffocating density and unliveable conditions** of the old quarters.

3. Barcelona's Local Authorities vs. Madrid's Central Authorities

The path to implementing the **Eixample plan** was far from smooth, as it became a **political battle** between **Barcelona's municipal authorities** and the **Spanish central government in Madrid.**

Cerdà initiated the confrontation in **1855** with the **Report of the Draft Expansion Plan**, a document that accompanied his **detailed 1:5000 scale survey map** of the city's outskirts. This draft plan not only **anticipated the necessity of a large-scale urban expansion** but also **asserted Cerdà's own authority over its authorship**.

Alongside the draft plan, **detailed studies** on **engineering, drainage, housing, street circulation, and urban design** were submitted, showcasing the depth of his urban vision. The **topographic survey** was particularly significant—it extended beyond Barcelona to include the **inland plain and six surrounding towns**, effectively **laying the groundwork for metropolitan-scale planning**. In this, Cerdà envisioned **Barcelona's transformation into a modern city, well beyond its medieval confines**.



(Fig.55,56) A radial urban layout with the historic center as a hub and major avenues radiating outward which reflected a more traditional European city expansion model, emphasising centrality and monumental urban planning proposed by architect Antoni Rovira for the expansion of Barcelona. **(56)** Portrait of Architect Antoni Rovira.

BIRTH OF BARCELONA'S EIXAMPLE

1. Cerdà vs. Barcelona: The Political Battle Over Expansion

The implementation of **Barcelona's expansion** was not just an **urban planning challenge**—it was a **political and legal struggle** between the city's **local government** and the **Spanish central government in Madrid.**

In response to the **Spanish government's directive for expansion**, **Barcelona's city council** organised its own **competition in 1859**, attracting **fourteen proposals.** The **winning entry**, submitted by **architect Antoni Rovira i Trías**, featured a **radial urban layout** with the **historic center as a hub** and **major avenues radiating outward.** This design reflected a **more traditional European city expansion model**, emphasising **centrality and monumental urban planning.**

However, **Madrid had already placed its trust in Ildefons Cerdà**, who had been officially authorised earlier in 1859 to draft an expansion plan. His **Plano de los Alrededores de la Ciudad de Barcelona y Proyecto de su Reforma y Ensanche** (Map of the Outskirts of the City of Barcelona and Project for its Internal Reform and Expansion) was ultimately approved by Royal Order in 1859 and reaffirmed by Royal Decree in 1860.

The conflict between **Cerdà's rationalist, grid-based vision and Rovira i Trías's radial plan** escalated into a legal and political battle. Barcelona's local authorities fought hard for Rovira i Trías's plan, but Cerdà had the upper hand due to his strong political and institutional connections in Madrid. As a former **National Militia leader, national legislator, and member of the Corps of Engineers**, Cerdà had backing from influential figures in the **Ministry of Development**, which had final approval authority over the expansion plan.

(Fig.57) Barcelona in 20th Century, a vector image of the city.

2. Cerdà's Legacy: A Masterpiece of Urban Planning

Despite local opposition, Cerdà's plan prevailed. His 1859 proposal remains a landmark in urban planning, laying the foundation for **Barcelona's modern identity**. Unlike Rovira i Trías's radial design, Cerdà's grid system prioritized **functionality, public health, and adaptability** principles that continue to shape Barcelona's urban landscape today.

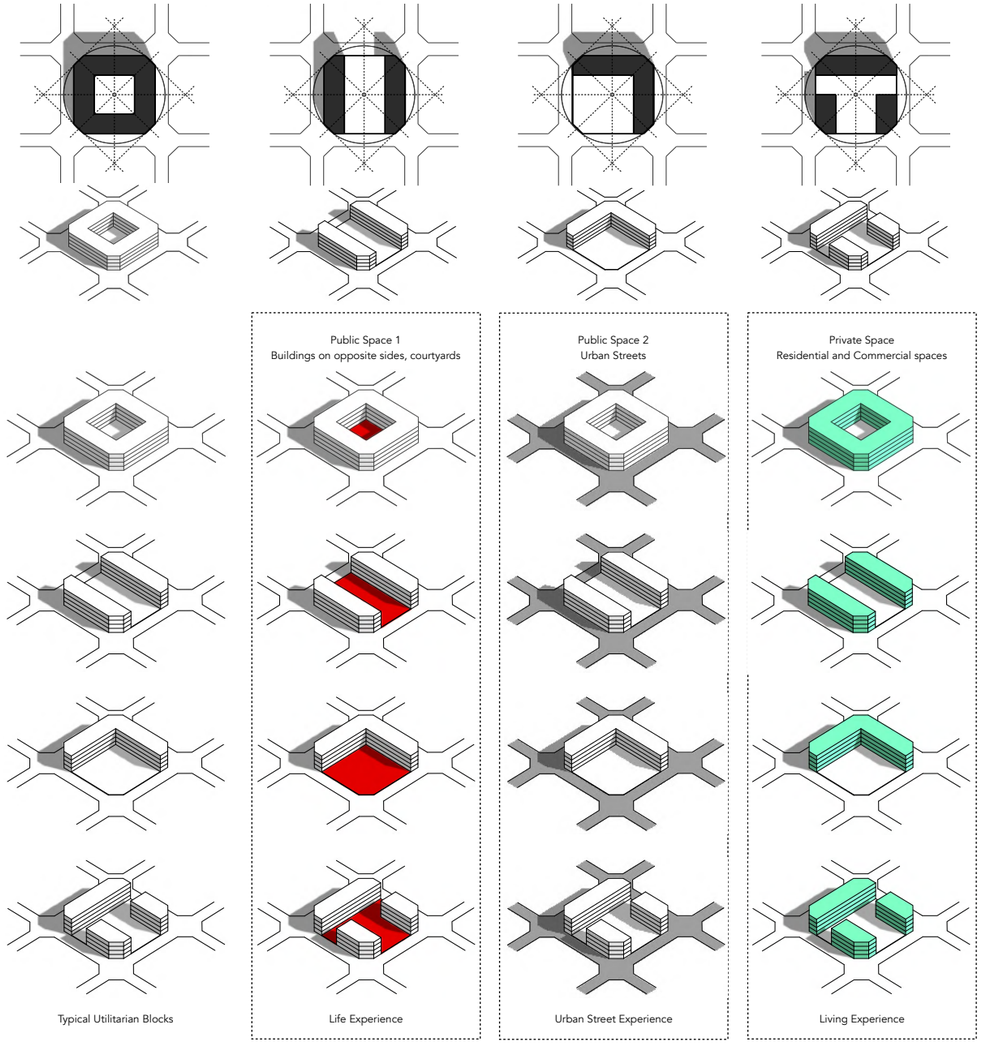
FEATURES OF BARCELONA'S EIXAMPLE

1. Cerdà Revolutionary Urban Vision: The Intervía Concept

Ildefons Cerdà transformed urban planning, redefining how cities are designed and developed. His vision operated at multiple scales, encompassing everything from **housing layouts to large-scale metropolitan infrastructure**. The defining features of his plan **a structured street grid with chamfered 45° corners** remain instantly recognizable both from the air and at street level.

Beyond roads, **Cerdà strategically positioned two rivers as natural boundaries** for Barcelona's expansion: the **Besòs to the north** and the **Llobregat to the south.** This approach aligns with **historian Fernand Braudel's insight** that **rivers and roads form the backbone of historical continuity.** However, **Cerdà's innovation extended beneath the surface as well**—he meticulously planned **stormwater drainage, sanitation networks, gas lines,** and even **provisions for future underground rail transport.** His blueprint integrated **housing, public spaces, parks of various scales, and essential urban services,** ensuring a **balanced and well-connected city.**

A key aspect of his plan was the intricate relationship between **buildings and streets**, which he studied in great depth. While modern discussions often highlight the **113m² city blocks**, Cerdà himself referred to them as **"intervías."** This term is



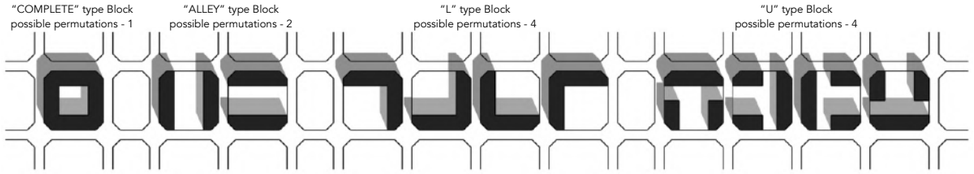
significant, as it underscores the **dynamic interplay between streets, built spaces, and public areas**, rather than merely viewing blocks as isolated structures.

The term **"intervía"** was central to Cerdà's vision, highlighting the intricate relationship between **streets and built environments**. While often translated as **"block,"** intervía conveys a **more nuanced and multifunctional concept** it represents not just the structures but also the spaces between them and their interaction with public areas.

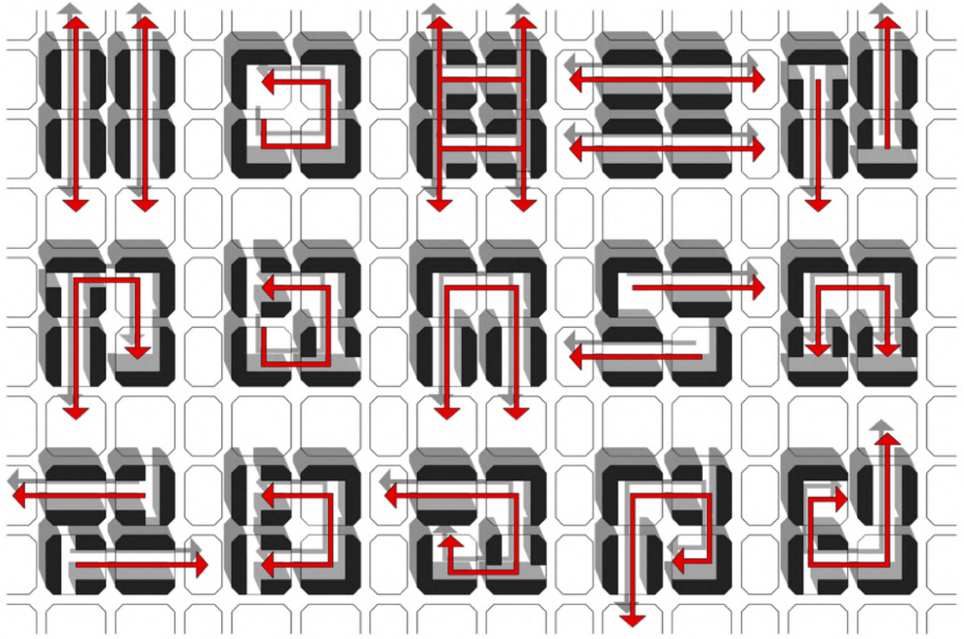
Cerdà's **intervía design balanced built and open space**, ensuring that half of each block remained unconstructed. This principle fostered better **ventilation, natural light, and accessibility**. He also set **a height restriction of four stories**, carefully proportioned to the **20m wide streets** and the **56m wide open interiors** within each block. His meticulous studies resulted in **varied interway configurations**, refining the relationship between **buildings, streets, and public spaces** to create a healthier and more functional urban fabric.

In modern Barcelona, the blocks are commonly referred to as **"islands" (illes in Catalan)**. Cerdà's plan introduced significant advancements over the **dense and constricted walled city**, transforming urban living conditions. His vision was rooted in **social equity**, ensuring that all citizens, regardless of class, had access to **quality housing**, with an average apartment size of **90 m²** for the working class.

The **grid-based layout,** with **half of each intervía left unbuilt,** allowed for **better ventilation, sunlight, and open spaces.** Additionally, **Cerdà strategically integrated small plazas, expansive parks, hospitals, and essential public facilities,** evenly distributed across the city. This approach promoted **equal access to light, air, green spaces, and urban amenities,** shaping **Barcelona into a more inclusive and livable metropolis.**



(Fig.58) a study of Block typologies i.e Complete, Alley, L type and U type Blocks and their Possible permutations by rotating them 90 degrees. This study helps in understanding the concepts of Ildefons Cerda's Expansion for Barcelona.



(Fig.59) Block permutations are arranged in certain ways creating different cluster typologies, this study helps in finding out the possible cluster permutations creating different pedestrian pathways in and around the block making the city a human centred city.

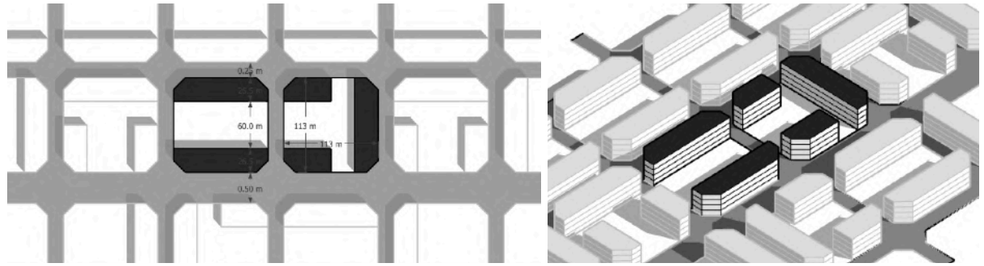
2. Cerdà Revolutionary Urban Vision: The Intervía Concept

Cerdà's **urban framework** was fundamentally composed of **streets and housing**, which he meticulously studied through various permutations and combinations of **housing units, blocks, intersections, and the overall grid**. His housing proposals evolved across different versions of his plan, particularly in **1855, 1859, and 1863**, reflecting his commitment to **spatial efficiency and social inclusivity**.

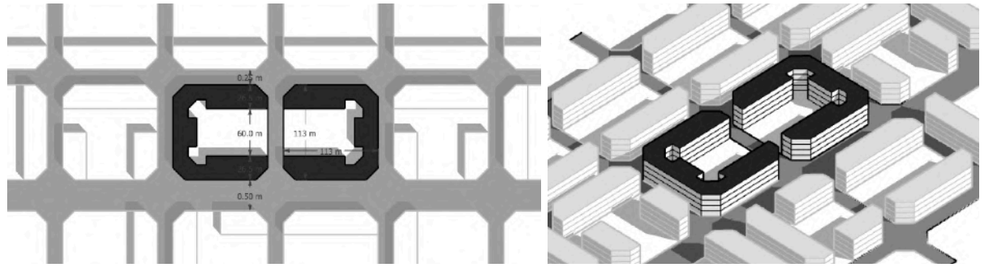
In the **1855 anteproyecto (draft)**, he presented **1:200 scale drawings** of multiple housing types: **four models for the middle and upper classes**, ranging from **120 to 180 m²**, and at least **six types for the working class**, sized between **69 and 103 m²** a substantial improvement over contemporary housing standards. Additionally, his plan introduced **wider streets**, with **standard widths of 35 m and avenues stretching up to 50 m**, a stark contrast to the **narrow 4–8 m streets of the old city**, significantly enhancing **ventilation, mobility, and overall urban quality**.

The **1859 approved plan** retained Cerdà's **housing typologies** while introducing key urban regulations. The **building height was capped at 16 meters (four stories),** and structures could extend **a maximum of 28 meters from the street.** This ensured that **half of each block (intervía) remained open**, accommodating **private gardens, public parks, and playgrounds**, fostering a balance between built and open spaces.

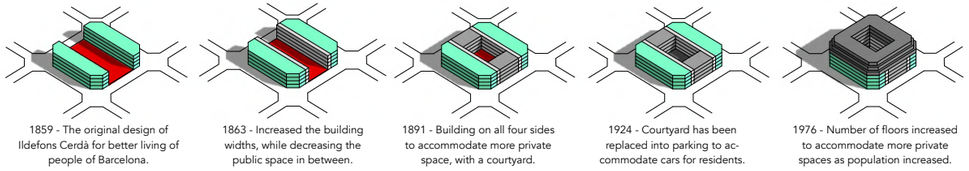
A **three-tiered street hierarchy** was established, with **minimum street widths set at 20 meters (from facade to facade),** while **larger avenues and boulevards** were designed to be **30 and 50 meters wide, respectively.** Notably, in standard streets, **half of the 20-meter width (10 meters) was allocated to sidewalks, trees, and street furniture,** emphasizing pedestrian-friendly design. The **1859 plan** also introduced the now-iconic **113 × 113-meter block module**, shaping the structure of modern Barcelona.



(Fig.60) A typical Eixample block designed by Cerdà, having two buildable façade blocks. Cerdà's plan also introduced a street hierarchy with boulevards 30–50m wide and standard streets at 20m. Where the block itself is 113sq.m



(Fig.61) Development of a typical Eixample block over time. Transforming two buildable façade blocks into three sided blocks, increasing urban density. Cerdà's plan also introduced a street hierarchy with boulevards 30–50m wide and standard streets at 20m. Where the block itself is 113sq.m



(Fig.62) : Historical development of a typical Eixample block (intervía), where a series of transformation has taken place of its structure and usage over time, from 1859's original design of Ildefons Cerda to today's fully built blocks.

In **1863**, Cerdà finalized his **urban plan** at the **same 1:5000 scale**, refining it to accommodate **shifting economic and property market conditions**, highlighting its adaptability. This **revised version** incorporated **recently constructed buildings, new railway lines**, and, most notably, **increased building density** through two key modifications.

Firstly, the **buildable area from the street front was extended** from **20–24 meters to 25–28 meters**, allowing deeper structures. Secondly, the **number of buildable facades per block increased** from **two to three sides**, effectively enhancing urban density. Additionally, the **number of blocks in the plan was expanded**, while **block dimensions, building depths, and layouts were adjusted** based on **existing roads, topography, and contextual factors.** These refinements ensured a **more adaptable and resilient urban framework**, aligning with the evolving needs of the city.

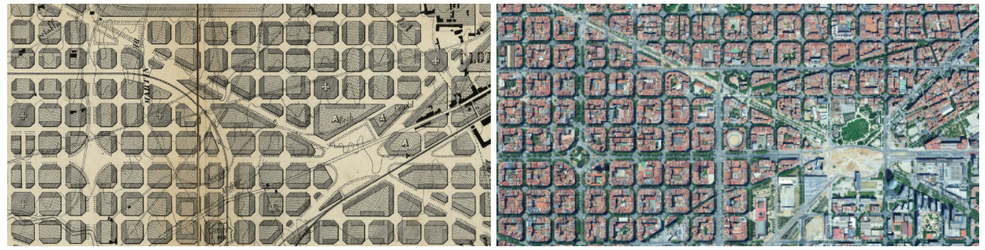
CURRENT URBAN SETTING

While the street grid and chamfered blocks were followed scrupulously, it was the building depths and heights that were violated, and increasingly so, until the 1980s.

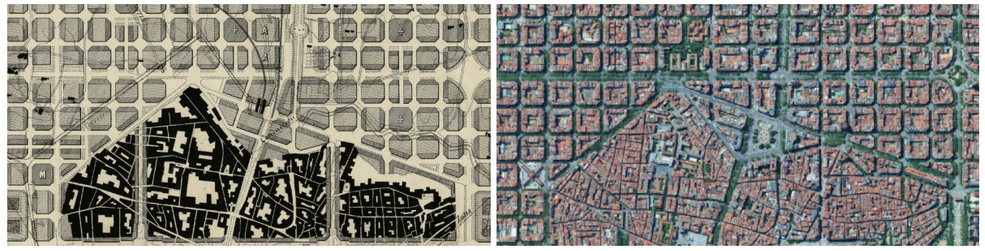
Over the **150 years** since Cerdà's plan was approved, several key aspects of his original vision were either **never fully realized** or **degraded over time**:

- **Interior Courtyards** – The **open spaces** within each **intervía** (block) were meant to be **half-built, half-open**, allowing for ventilation, natural light, and communal courtyards. However, over time, many of these spaces were **built over** to maximize real estate profits.

- **Limited Building Coverage** – Originally, buildings were meant to occupy only **two sides of each block**, ensuring cross-ventilation and open space. This was **largely ignored**, leading to denser, less breathable urban fabric.



(Fig.63) Comparison of Barcelona's urban layout. *(Left)* A fragment of Cerdà's original plan, illustrating block types and orientations. *(Right)* The current state of Barcelona, where all block sides and inner courtyards have been fully built.



(Fig.64) Comparison of Barcelona's urban layout. *(Left)* A fragment of Cerdà's original plan, illustrating block types and orientations. *(Right)* The current state of Barcelona, where all block sides and inner courtyards have been fully built.

(Fig.65) Comparison of Barcelona's urban layout. *(Left)* A fragment of Cerdà's original plan, illustrating block types and orientations. *(Right)* The current state of Barcelona, where all block sides and inner courtyards have been fully built.

- **Building Height Limit** – Cerdà proposed a **maximum height of 16 meters (four stories)** to maintain a human-scale environment. This restriction was repeatedly **violated**, with many buildings far exceeding the original height limits.
- **Public Parks within 1.5 km of Every Block** – Cerdà envisioned **green spaces** as an integral part of the city, ensuring that no resident was too far from a public park. However, park distribution was **uneven**, and many areas were left without adequate green spaces.
- **Great Park by the Besòs River** – A **massive park (3.5 km × 1.5 km)** was planned along the **northeastern edge of the expansion** to provide a green lung for the city. This park **was never fully realized**, and the area was instead urbanized in a way that deviated from Cerdà's original vision.

Despite these departures from the plan, **Cerdà's grid and chamfered corners** remain defining elements of Barcelona's urban identity.

CONCLUSION

Cerdà's original plan aimed to strike a balance between **high population density** and **ample street-accessible green spaces**—two inherently conflicting objectives. His plan sought to integrate **open courtyards, public parks, and broad avenues** to ensure both livability and efficient urban expansion.

However, as the city evolved, a **trade-off approach** emerged, favoring **higher population density** at the expense of green spaces. While the **grid structure and wide streets** remained intact, the intended **open courtyards within each block** were progressively built over, reducing access to natural light and ventilation. Similarly, the plan for **large parks and distributed green areas** was either partially implemented or abandoned altogether in favor of real estate development.

Ultimately, while Cerdà's plan laid the foundation for Barcelona's **organized and functional urban layout**, the **priority shift towards densification** led to a cityscape that diverged from his original vision of an evenly distributed, green, and breathable metropolis.

Although unrecognized at the time, Barcelona's urban development followed a **preference-based approach** in decision-making. This approach effectively **converted the challenge of balancing multiple conflicting objectives**—such as **high population density** and **abundant green spaces**—into a **single-objective optimization problem** that prioritized **urban densification**.

Rather than **maintaining the delicate equilibrium** that Cerdà initially envisioned, city planners and developers gradually **favored one objective over the other**, leading to a cityscape where **higher building density took precedence over open spaces**. This shift resulted in the **progressive enclosure of interior courtyards**,

increased **building heights**, and **a reduced emphasis on large parks and distributed greenery**.

In hindsight, this strategy reflects a **pragmatic trade-off**, ensuring that Barcelona could accommodate its growing population while still retaining key elements of Cerdà's structured urban plan—albeit in a more **density-focused** form than originally intended.

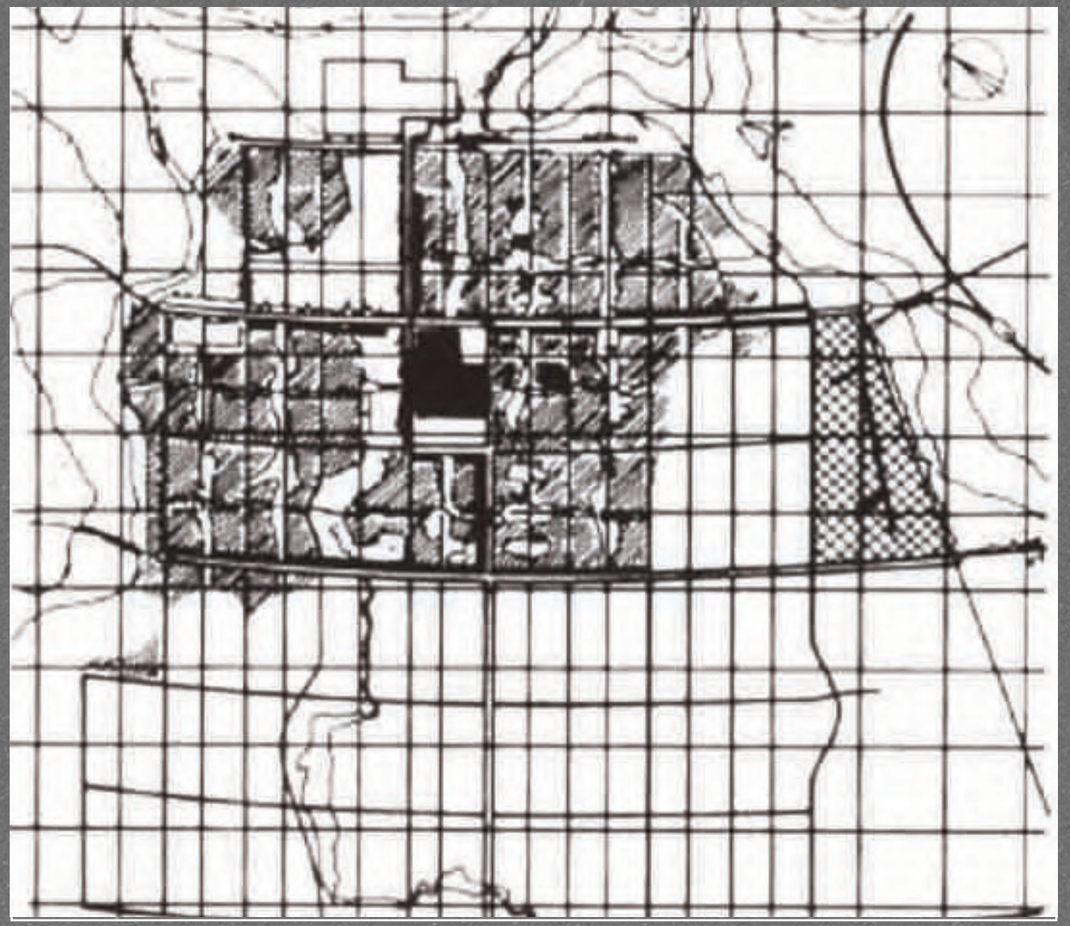
Although Cerdà's original plan carefully balanced **open space and livable areas**, significant modifications were introduced after his proposal. Political decisions and investment-driven opportunities reshaped the original **two-sided block with an open courtyard** into the now-iconic **four-sided chamfered block with an enclosed courtyard**. This transformation ultimately gave rise to **Barcelona's distinctive eight-sided blocks**, altering the spatial and visual connectivity that Cerdà had envisioned.

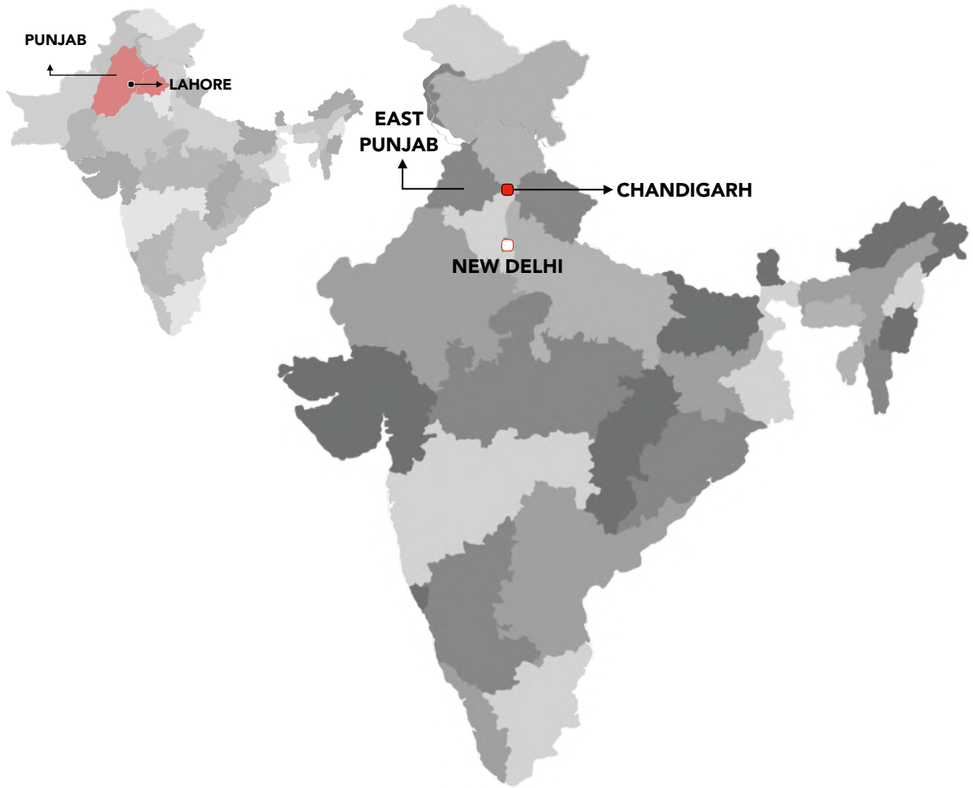
By deviating from the **open and permeable layout** originally intended, the city prioritized **building density over green space**, significantly impacting the urban environment. As a result, Barcelona's **current green area per inhabitant** stands at **6.5 square meters per person**, which is **less than half the 15 square meters per person** recommended by the **World Health Organization (WHO)**. This shift illustrates how **economic and political pressures** can override initial urban planning ideals, leading to **unforeseen long-term consequences** in public space distribution and environmental quality.

Chapter 2 : URBAN STUDY 2

CHANDIGARH

In this chapter, Chandigarh is examined as one of the most significant examples of modernist urban planning in post-independence India. Designed by the renowned architect Le Corbusier in the 1950s, Chandigarh represents a bold attempt to embody modern ideals through a rational grid system, functional zoning, and monumental architecture. The city was envisioned as a symbol of a progressive, secular, and independent India—free from colonial constraints. Its sector-based layout, hierarchical road network (the famous "7 Vs"), and integration of natural elements reflect a deep concern for order, accessibility, and human scale. This chapter explores the design principles behind Chandigarh, its symbolic elements such as the Capitol Complex, and the ways in which the city has evolved over time. Through this case study, the chapter delves into how grid planning was used not only as a spatial tool but as a political and cultural expression of a new national identity.





(Fig.66) State map of India before Independence (before 1947) Punjab and it's then capital city Lahore.

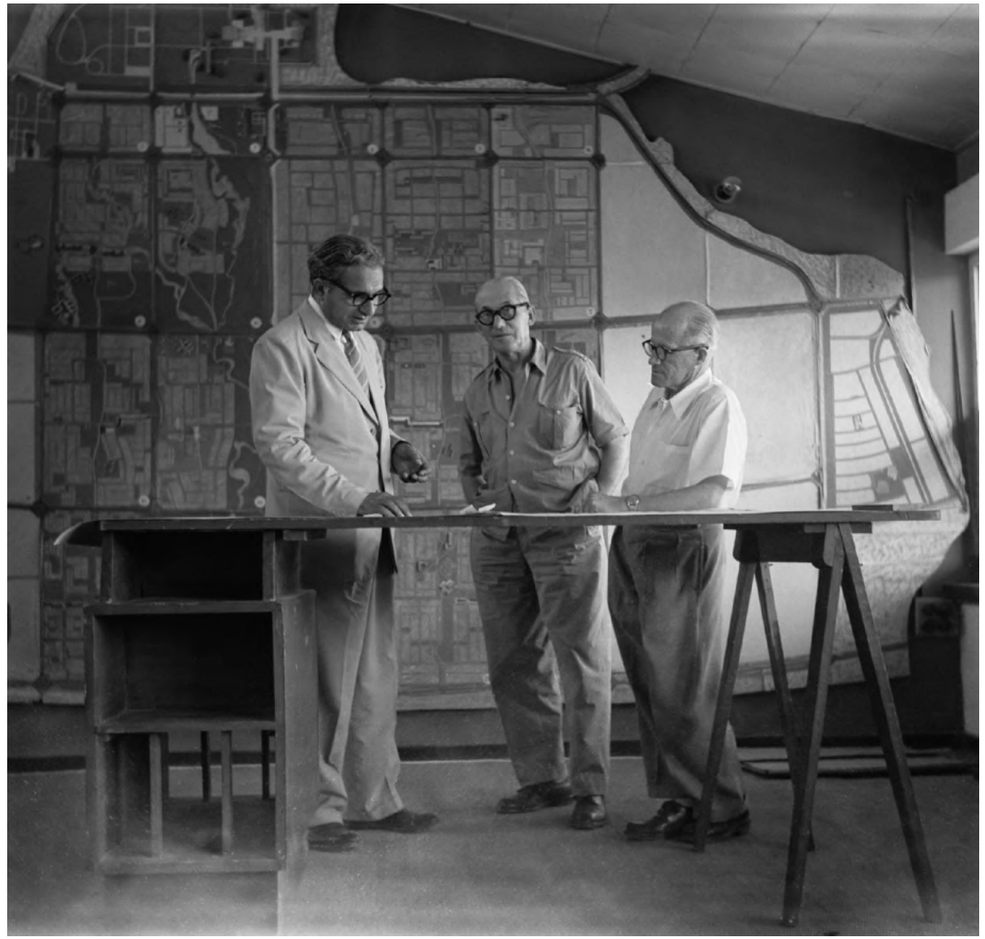
(Fig.67) State map of India After Independence (after 1947) Punjab divided into West and East Punjab with new capital city Chandigarh.

THE CREATION OF THE CITY - BIFURCATION OF INDIA & PAK.

The city of **Chandigarh** was conceived in the **crisis of confusion** accompanying the birth of the **new Indian republic** freed of **British colonial rule**, the country was torn within by **religious and political conflict**, and it seemed problematic that the newly formed state, foundering in a sea of **instability and disunity**, would survive at all. When the **bitter conflict between Hindus and Muslims** was finally resolved in **partition in 1947**, the provisions of **Punjab was split** between **India and the new state of Pakistan**. The Indian province of **East Punjab** was faced with the problem of **resettling the hordes of refugees** who had poured across the border having abandoned **homes, land, and possessions** in what was now Pakistan. Among the **dispossessed was the government itself**, uprooted from the **ancient provincial capital of Lahore**, now enclosed within the borders of the new Muslim state. Meeting in **Shimla**, the **old Himalayan summer capital of British India**, the rulers of Punjab began their attempts to **create order from chaos** and establish a **permanent government headquarters**. In spite of **economic difficulties** and **political uncertainty**, the government decided **not to attempt makeshift relocation** in any existing town, but to **build a new capital city**.

After **partition**, the **population of all existing towns in East Punjab more than doubled** due to the **migration of displaced persons from Pakistan**. As a government publication pointed out, *"Most of these towns, even before partition, lacked essential amenities such as **adequate drainage and water supply**, and none of them had **schools or hospitals** meeting modern standards. After partition, these services had to cater to a **greatly increased population**, and in most places they were either on the verge of **breaking down** or so inadequate they were practically **non-existent**."*

It was felt that **adding the capital function** to any existing town would require **rebuilding essential facilities from scratch**, and the **cost would be the same or**



(Fig.68) Portrait of P.L. Varma (on left), Le Corbusier (centre) and Pierre Jeanneret (on right) with a huge master plan of Le Corbusier's Chandigarh on the wall behind at Le Corbusier's office in Chandigarh.

more than doing so in a **new town**. Furthermore, **none of the existing towns were expandable** beyond a certain limit, nor were any capable of providing **adequate floor space** for **government functions and staff**.

Shimla, the **temporary capital**, was rejected as a **permanent site** due to its **remote location** and **difficult access** during **winter**. **Ambala** was also ruled out, as it was the **main base of military operations** on the **north-west frontier**, and placing the government near a **cantonment** was seen as **strategically unwise**, since it would be a **primary target in case of enemy attack**.

The **location of the capital** was never **free of controversy** in the early stages, with **pressure groups** continuously pushing for **alternative sites**. However, more significant than **practical concerns** in the decision to build a new city was the **symbolic value** of such an act. At this time, **India**, imbued with **new national pride**, needed **focal points for unity**, and the **Punjabis needed a moral boost**.

The **new city**, born in a period of **disorder and uncertainty**, could serve as a **tangible symbol of the will** to maintain a **stable society**. Above all, its creation was a **gift to the future**—a statement that **India**, having thrown off the **colonial yoke**, was ready to **stand independently**, **shape its own destiny**, and **govern itself** even in the face of **natural and societal challenges**.

Much of the **impetus for the project** came from the **enthusiastic support of Prime Minister Pandit Jawaharlal Nehru**, who hailed Chandigarh as, "a new town, symbolic of the freedom of India, unfettered by the tradition of the past and expression of the nation's faith in the future." In **endorsing the project**, the **central Indian government** agreed to **lend Punjab over one-third** of the estimated **$35 million** needed for the city's construction.

Throughout the crucial years of its early development, the destinies of the **Chandigarh Project were directed by two men**: **P. L. Verma**, the **chief engineer of Pun-**

(Fig.69) Portrait of Le Corbusier (left), Pierre Jeanneret (next to Le Corbusier), P.L. Varma (right) and P.N Thapar (next to P.L Varma).

(Fig.70,71) Portrait of Le Corbusier and Pierre Jeanneret. **(71)** Portrait of Architect Maxwell Fry (left) and Dame Jane (right)

jab, and **P. N. Thaper**, a **former British Indian civil servant** who became the **administrative head** of the project in **1949**. Verma was closely associated with the project from the beginning. At the time of **Partition**, he was in the **United States** leading an Indian mission on **road construction**. In **October 1947**, he was asked by the Punjab government to **study city planning in the U.S.** with the aim of building a new capital. He consulted with the **Federal Works Agency** and returned to **assist in site selection**. After evaluating **eight potential sites**, the final **location was selected in spring 1948**.

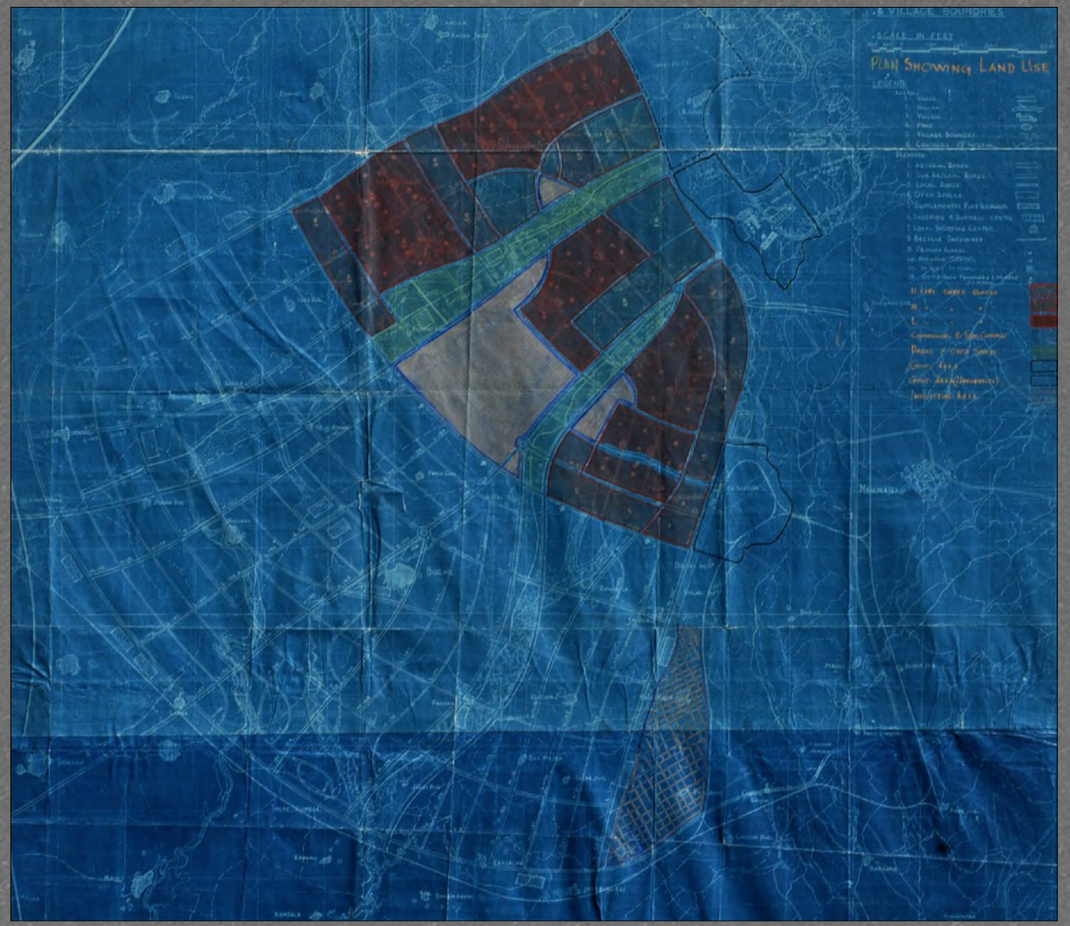
The site, **chosen through airplane reconnaissance**, was in the **Bathinda submountainous area of Ambala district**, about **150 miles north of New Delhi**, the capital of the Republic. It was a **flat, gently sloping plain of agricultural land**, scattered with **groves and mango trees**, marking **24 villages or hamlets**. From one of these villages—**the site of a temple to the Goddess Chandi**—the new city would derive its **name: Chandigarh**. Overall, the construction of the city required the **displacement of approximately 9,000 people**, for whom **compensation was arranged** and **land set aside for resettlement**.

The **slope of the site** is **towards the south**, guiding the **eye upward** to the **endless ranges of the Himalayas**, where **snow-capped peaks** are sometimes visible **even during the hottest days in the plains**. **Le Corbusier** remarked, "The site is marvelous. It is a big chance to have such a view. I admire Thapar and Varma. They have seen the possibilities of the site. They are big men. The landscape all over will be open."

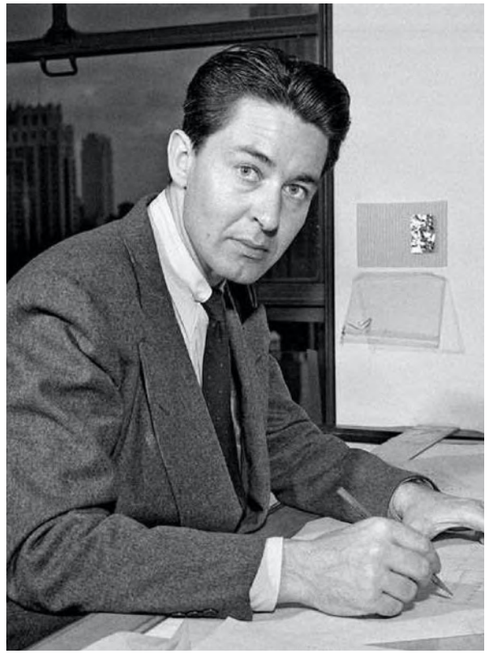
Referring to the **practical aspect** of the setting, **Le Corbusier** reported, "Deterrent chosen how far is not a single difficulty to topographic, not a single difficulty to subsoil, and the **natural drainage** of water permits the **automatic irrigation** of the limitless green of the city. Such 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 overpowered the urban planner."

ALBERT MAYER : MASTER PLAN

In this section, we examine Albert Mayer's original vision for Chandigarh, developed in collaboration with architect Matthew Nowicki. Conceived shortly after Indian independence, Mayer's plan emphasized a human-scaled, decentralized city structure. He proposed curvilinear road networks that followed the natural topography, along with self-contained neighborhoods organized around green spaces and community facilities. Drawing inspiration from the Garden City movement, his approach prioritized walkability, community interaction, and integration with nature. Although his untimely death led to the abandonment of the plan and the eventual involvement of Le Corbusier, Mayer's ideas laid an important conceptual foundation for Chandigarh's planning.



(Fig.72) Portrait of Architect Albert Mayer, the man first selected to design the master plan of Chandigarh by Indian Prime Minister Jawaharlal Nehru. Previously Albert Mayer was involved in large scale Indian projects including the master plan of Bombay and New Delhi during Colonial period.



(Fig.73) Portrait of Architect Matthew Nowicki's known for his"leaf" plan for Chandigarh as an alternative for Albert Mayer's Chandigarh Master Plan. Mathew Nowicki and Albert Mayer worked together for master plan of Chandigarh, later Nowiciki's unfortunate death led to search of new Architects.

The man first selected to design the **master plan of Chandigarh**, **Albert Mayer**, was **recommended by Prime Minister Jawaharlal Nehru**. Mayer, a partner in the New York firm of **Mayer, Whittlesey, and Glass**, had served as a **lieutenant colonel in India during World War II**, becoming **acquainted with Nehru** and developing **familiarity with India and its problems**. Although his **plan of Chandigarh** would ultimately be **superseded**, he has since become involved in a number of **sizeable Indian projects**, including the **master plan of Greater Bombay**, the **Etawah rural redevelopment programme**, and the **master plan of the New Delhi region**.

Late in **December 1949**, the **contract for the first master plan of Chandigarh** was completed and the **work begun**. According to the programme's specifications, the plan was to be **prepared in detail for a population of 1,50,000**, with **provisions for future expansion** showing **roads and land use**. The master plan would include a **layout for major roads**, **road sections**, **grade separations**, and designated areas for **residence**, **business**, **industry**, **recreation**, and more.

Plans were to be made for **special areas** including a **Capital Complex** (with the **Provisional Assembly**, **Governor's Palace**, and **High Court**), a **main business district**, **city government buildings**, and **residential neighborhoods**. The plan also required locations for **hospitals**, **museums**, **bus terminals**, **schools**, and **local shopping centres**.

Landscaping was to be indicated for **parks**, **principal avenues**, **squares**, and **parkways**. Architectural control would include **plans and sketches** for significant areas like the **Capital Area**, **main business area**, and **railway station**. A **university site** was also to be designated.

Connections were to be indicated between the **city and regional rail and highway routes**, while **sites were required** for **water works**, **headworks**, **drainage disposal works**, as well as **electrical substations** and **transmission lines**.

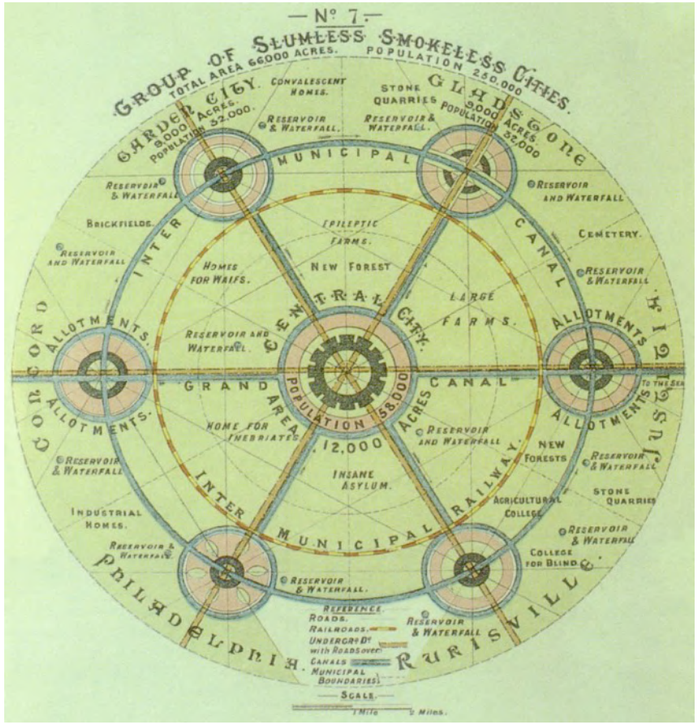
(Fig.74) The revised Albert Mayer's plan of Chandigarh, 1950 (From "Chandigarh, The Making of an Indian City" by Ravi Kalia, 1987) The black square is the city center. The idea that the city is divided into super blocks with green belts was succeeded by Le Corsbusier.

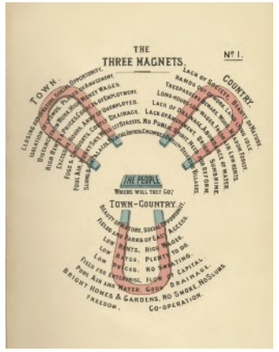
The **initial work of the design** was to be done in **New York**. It was assumed by **Mayer**, however, that while the **master plan** was being devised and drawings sent to India, an **office of Indian architects and engineers** would proceed with the **detailed building plans** and **preparations for construction**. This was discussed in **correspondence between Mayer and Indian officials**.

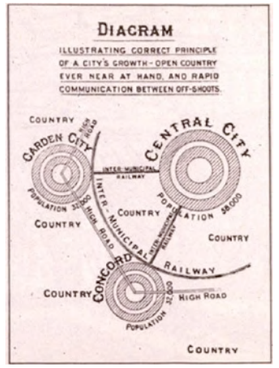
THE FRAMEWORK OF THE CITY.

The **master plan** which **Albert Mayer** produced for Chandigarh assumed a **Fan shaped outline**, spreading gently to fill the site between the **two river beds**. The **provisional government buildings** are located **beyond the upper edge** of the city, with **work areas** in one of the **revers**. The **central business district** occupies an area **near the centre**. An **upcoming network of main roads** is **surrounded by residential superblocks**, each containing a **central area of parkland**. **Two larger parks** stretch through the city, and to the **east**, an area is **set aside for industry**. The **initial development** of the city was to take place in the **northerly portion**, with **possible expansion projected towards the south**.

The **flatness of the site** allowed **almost complete freedom** in creating **street layouts**, and it is of interest to note that the **overall pattern deliberately avoids a geometric grid** in favour of a **loosely curving system**. The plan appears to reflect the **romantic picturesque tradition** of civic design, which originated in the **19th century** as a reaction against the **sterility and monotony** of the classical **geometric approach** to planning. During the rapid growth of **industrialism**, the **geometric grid**, once key to an **ordered plan**, had become a **favourite device of land speculators**, used for **simple city lot layout**. To many, large-scale developments like those of **Haussmann** and his imitators—with **long straight boulevards**, **symmetrical plazas**, and **uniform facades**—ignored the **possibilities of richness and diversity** in the urban landscape.





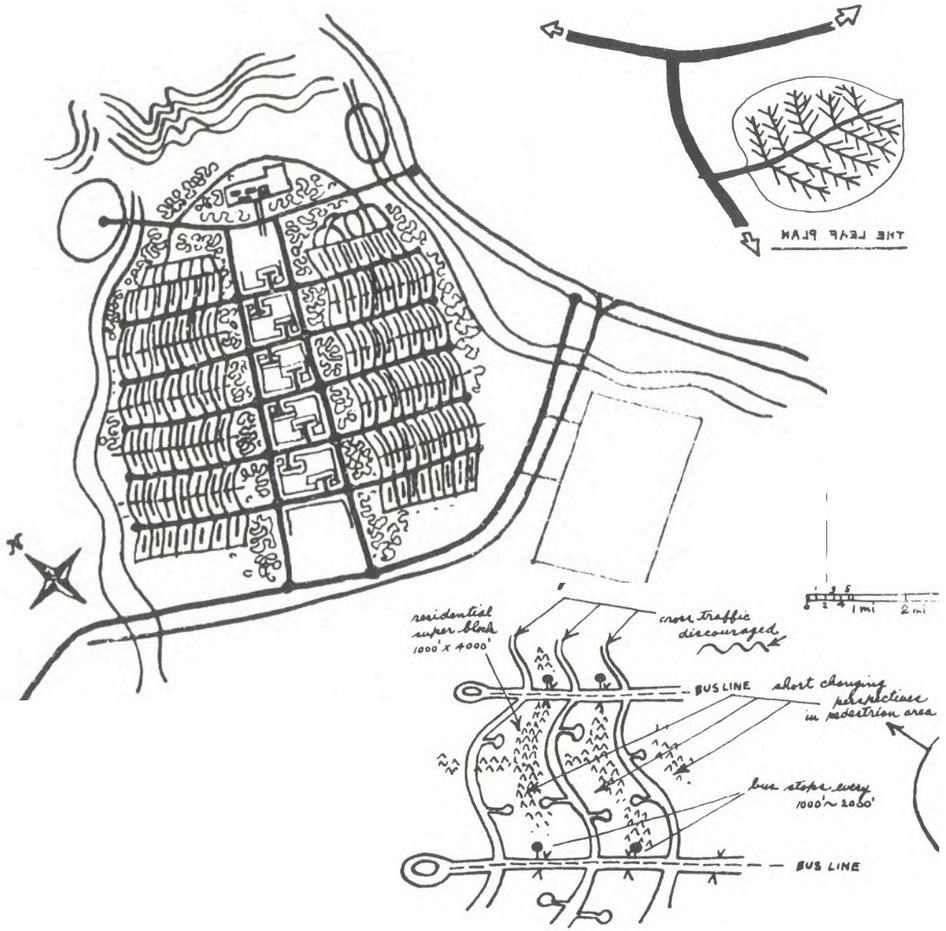


(Fig.75) Schematic Diagram of Ebenezer Howard's Garden City (1898), illustrating the concentric layout with a central core, surrounding residential and industrial zones, and a permanent agricultural green belt.

(Fig.76,77) Three Magnets' diagram (1898), showing the choice between Town, Country, and the balanced vision of Town-Country, which became the basis of the Garden City concept

In reaction came a renewed interest in the more **organic**, **irregular**, and **small-scale variety** of the **medieval settlement**, with a **deliberate attempt to emulate its irregularities** in the growing **romantic suburbs**. Reinforcement for the **non-geometric ideal** in urban planning came with the **1889 publication** in Germany of **Camillo Sitte's book**, *Der Stadtbau*. Sitte conducted **detailed studies of medieval town plans**, aiming to show that they were not products of **irrational growth**, but were instead laid out according to **well-understood aesthetic principles**. He **criticized the modern city plan** of his time, with its **repetitive geometric grids** and **wide, scaled boulevards**, and advocated for a return to **intimate groupings**, **symmetrical space enclosures**, and **broken vistas**—qualities he admired in medieval cities. Sitte's essential contribution was to **elevate the picturesque** from mere **sentimentality** to a form of **logical urban design**.

The **informal and non-geometric plan** persisted, though limited mostly to **small-scale or suburban projects**, and became associated with the **English Garden City movement**. Gaining prominence in the **late 19th century**, this movement aimed to **counteract the negative effects of sprawling industrial cities** by establishing **new, self-sufficient cities**, **restricted in size** and **surrounded by green belts**. These new towns, envisioned by **Ebenezer Howard**, sought to **combine the best of town and country**—offering **employment**, **healthy living conditions**, and **community engagement**. Although **Howard did not prescribe a fixed urban form**, preferring adaptation to **site-specific conditions**, the movement generally **reacted against large industrial cities**. As the name suggests, the emphasis leaned more towards the **"garden"** than the **"city"**. While there is **no single formula** for Garden City planning, its followers often focused on the **domestic environment**, promoting **low-density housing** as defined by **Raymond, Unwin** in **Letchworth**. What these plans often **lacked was monumental urban form**, and although **Albert Mayer** wanted **Chandigarh** to have a sense of **greatness**, he was cautious of creating an **"overwhelming greatness."**



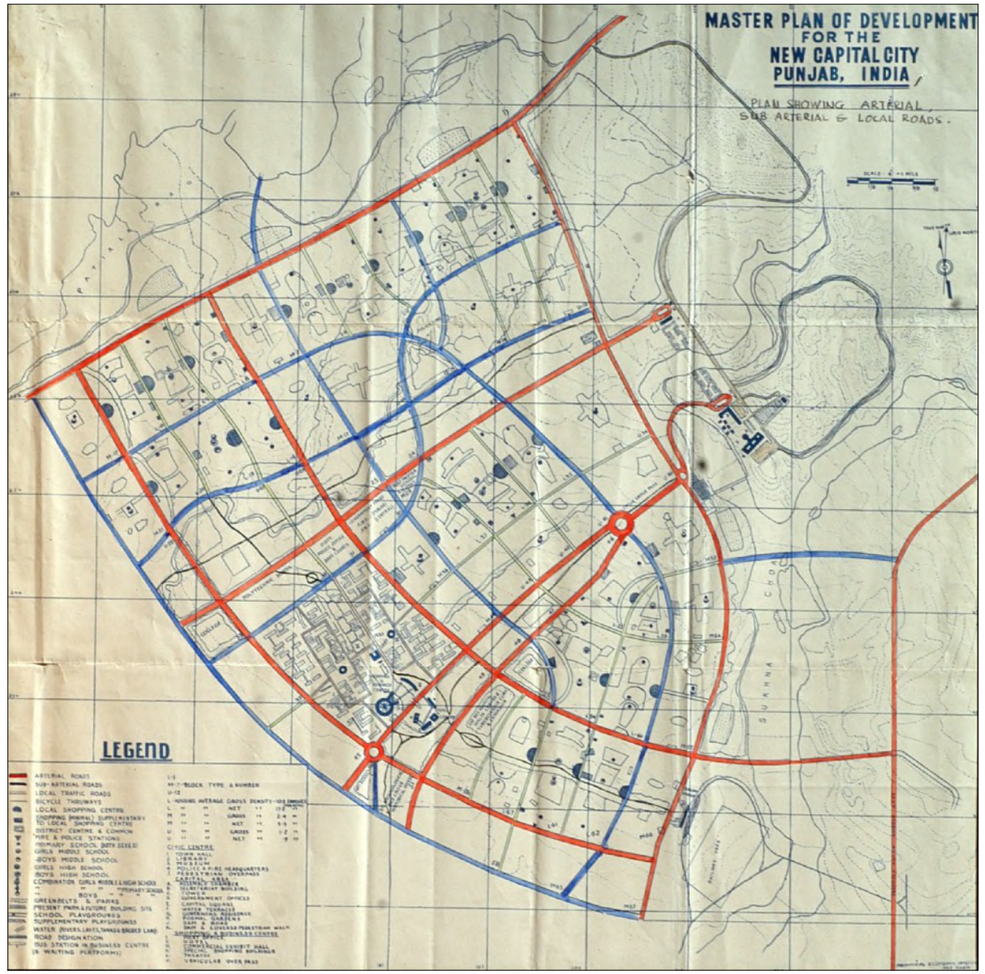
(Fig.78) Matthew Nowicki's "leaf" plan for Chandigarh as an alternative, 1950. Nowicki thought that a city had an 'everyday function' and a 'holiday function' to perform. For the latter in Chandigarh he proposed to make the part of the leaf stalk a vast area for sports and culture.

The concept of the **Garden City** aroused **considerable international interest**, and while **similar communities were attempted outside England**, they **failed to achieve the necessary economic base for self-sufficiency**. In the **United States**, examples include **Radburn (1929)** and the **Greenbelt towns of the 1930s**. These were **cited by Albert Mayer**, along with **Baldwin Hills**, a **superblock development in Los Angeles (1941)**, as **sources of inspiration for the Chandigarh plan**.

Mayer characterised his method of approach as empirical rather than formal, with the physical aspect of the city growing from a conception of life within it.

Mayer had stressed his desire for a **beautiful city**, stating that since the **City Beautiful concept** was abandoned 50 years ago and **functionalism and sociology took over**, the idea of a **large and compellingly beautiful unity** had been neglected. "We are unabashedly seeking beauty," he declared. **Nowicki**, however, cautioned against such romanticism, emphasizing the importance of **logic and economy**, asserting that **"the utmost economy is the utmost beauty."** He **divided the life of the city** into two major functions: the **everyday function** (living and working), which defines the **pattern and texture** of the city plan, and the **holiday function** (recreation), which informs the **grand scale composition**. The **diagram of the holiday function** serves to **unite the city** and becomes a **graphic symbol of its plan**.

In addition to his suggestion for the conception of the master plan, **Nowicki also proposed a sketch design**, which he termed the **"leaf plan,"** the overall scheme being based on the **organic form of a leaf**. The **stem of the leaf** was interpreted as a **commercial axis** cutting through the centre of the city, from which would **branch off a vein-like system of traffic arteries**. The **Capitol complex** remained at the top, with the **university located to the west**. Nowicki highlighted the **polarities of the centre of thought (the university)** and the **centre of production (industry)** by placing them at **opposite corners of the city**. One finds in Nowicki's design a **departure from both** the **geometric simplicity of Le Corbusier's plan** and the **relaxed informality of Mayer's scheme**.



(Fig.79) Albert Mayer's original master plan for Chandigarh, developed with Matthew Nowicki, envisioned a fan-shaped city inspired by the Garden City movement. It emphasized curvilinear road networks, neighborhood units, and integration with the natural topography, aiming to create a humane, pedestrian-friendly urban environment.

ELEMENTS OF COMPOSITION

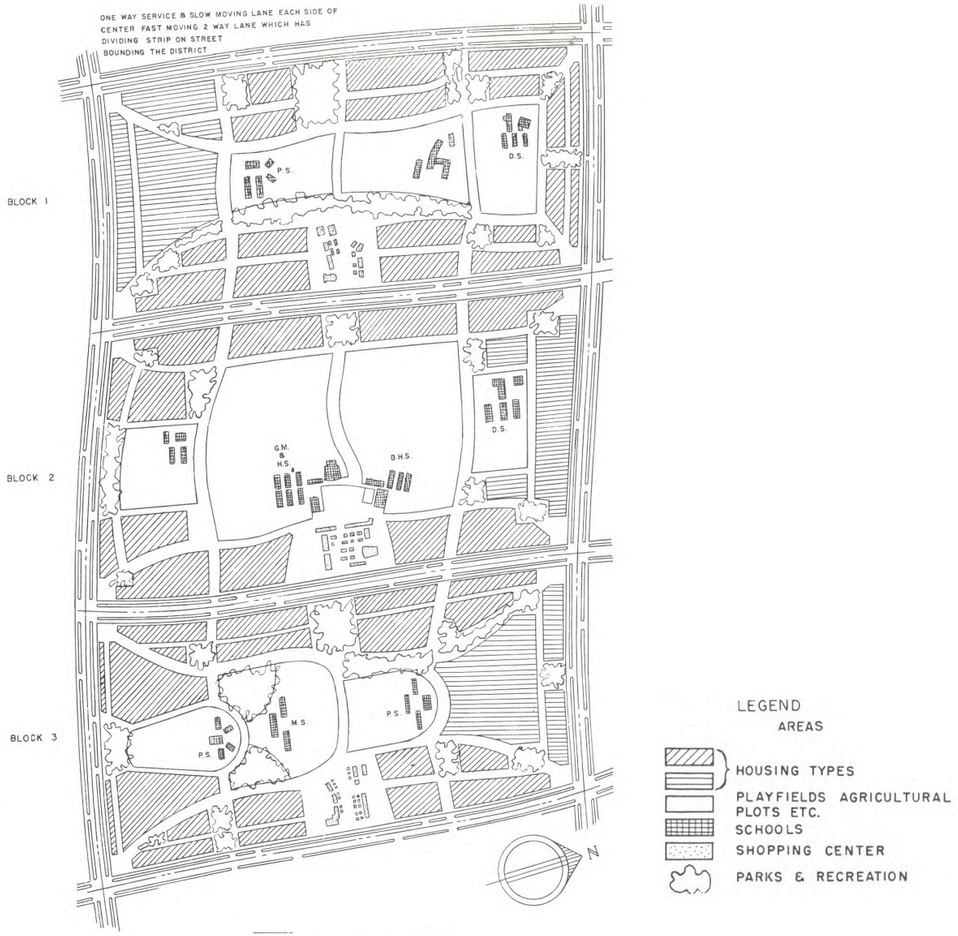
The **focal point of the city** was to be the **Capitol Complex**, containing the **provisional government buildings**, the **High Court**, the **Legislative Assembly**, the **Governor's Palace**, and the **Secretariat**. The **site selected** was at the **upper edge of the city**, on what was thought to be a **small promontory in a fork of the Sukhna Choe**.

One may note that the **symbolic placement of the Capitol Complex** in **Chandigarh** is analogous to the location of the **administrative center in Le Corbusier's *La Ville Radieuse***. In both cases, the area representing the **"thinking function" of the city** is positioned like the **head in relation to the human body**.

Although the nearest railway line was located east of the Sukhna Choe, planners chose to **place the station on the west side**, integrating it into the city. This decision was based on the understanding that **rail terminals attract urban elements**—such as industries, warehouses, and worker settlements—potentially forming **a railroad town**. Given Chandigarh's modest size, it was crucial to retain such functions within city limits to support its growth as a **self-sustaining urban entity**.

*T*he **university to be located outside the city**, on an eastern plateau. Mayer believed that **Chandigarh needed the university as a cultural center**, stating that *"a state (provincial) capital without any particular attraction other than government is usually a deadly dull place and stays a small, insignificant place."* As a result, the **university was placed at the extreme north** of the city, allowing it to benefit from both the **beauty of the location** and a **certain aloofness** from the city's everyday functions.

The main business district was located near the center, but specifically at **the southern edge of the initial city**. This strategic placement ensured that **as Chandigarh expanded southward**, the business district would **retain a central position within the growing urban fabric**.



(Fig.80) The Superblock, a self-contained neighborhood unit designed to minimize through-traffic while providing schools, parks, and community facilities within walking distance. prioritizing pedestrian movement over vehicular dominance.

THE SUPER BLOCK

The basic unit in the fabric of Chandigarh—the neighbourhood unit or superblock—is a planning concept that originated largely in the **1920s**. It was designed to create **residential environments shielded from the impact of rapid, high-volume motor traffic**. By replacing the **conventional city block** with this alternative unit, **different types of circulation could be separated**: **fast through-traffic** was directed to **wide roads with minimal intersections**, while **local vehicular and pedestrian movement** was confined within the superblock, **fostering safer and more cohesive neighbourhoods**.

The super block or neighbourhood unit concept may be useful from the point of view of **traffic circulation** and also as a **basic unit for the distribution of community facilities** is perhaps evident. As to whether or not such **physical division** actually produce, or even ought to produce, any **real sense of community** is a subject of some debate. Some **sociologists believe** that a neighbourhood, if it becomes **too isolated and self-centred**, particularly if it is a **low-income district**, may have **stultifying influence on its inhabitants** and **prevent them from making contact with the city at large**.

The neighbourhood unit developed in **Mayer's Plan** consisted of **super blocks** accommodating about **1150 families** each and grouped into **three block districts** containing about **3500 families**. Each super block would contain **housing, local shopping bazaar, primary and middle schools, and parkland**. The **central block**, which would house only **800 families**, would contain the **high school** for the district plus **augmented shopping facilities**. In addition, there would be such **community facilities** as a **health centre, theatre, and meeting halls**. This area would function, in Mayer's words, "**very much the same as the market square of the medieval European town**." In all the super block housing was **ranged around the perimeter**, with the **shopping bazaar**, **restricted to pedestrians**, at the lower edge. Included in the bazaar would be **provision of handicraft workshops and small-scale**

factories, following the **established pattern of such areas in India**. The **schools were placed in the park areas** in the centre of the blocks.

Three types of super blocks were projected, designated **L (Lower Income), M (Middle Income), and U (Upper Income)**. It was intended, however, to provide **some range of income within each block** to avoid **rigid stratification**, so that a **lower income block**, for example, would contain some **middle-income housing**; a **middle-income block**, some **lower and upper groups**; and a **U block**, some **middle groups**. In some cases, **M or U blocks would adjoin an L block**, on which they would **rely for local shopping, high schools, etc.**

THE SECOND TEAM

The death of Nowicki necessitated the **search for a new architect** for Chandigarh, and faced with a **stringent shortage of dollars**, **Thapar and Varma** felt compelled to **limit their choice to soft currency areas**. Taking with them the **completed master plan of the city**, they went to **Europe in the fall of 1950** with the intention of **hiring an architect at a salary of three to four thousand pounds a year**.

They had at that time no specific designer in mind, but **Thapar** has cited what he felt was the **need for a good modern architect** who was **not severely bound by an established style** and who would be capable of **developing a new conception** originating from the **exigencies of the project itself** and **suited to the Indian climate, available materials, and the function of the new capital**.

After travelling in Europe and interviewing few architects who were **not ready to leave** because of their involvement in **ongoing projects**, it was the **Minister of Planning who suggested Le Corbusier** and also recommended the inclusion of **Pierre Jeanneret**, whom he termed as a **"good detail man."** Later, **Thapar and Varma met and explained the situation to Le Corbusier**. According to Thapar, the architect's **initial reaction** was that the **whole proposition—especially the salary**

and required time in India—was ridiculous. He had **doubts that the city would actually be built**, a **natural attitude** in view of the many **unrealised projects** with which he had been associated. **Le Corbusier had experienced too many disappointments** and had **given his talent and energy to too many unrealised schemes** to wish to risk another failure.

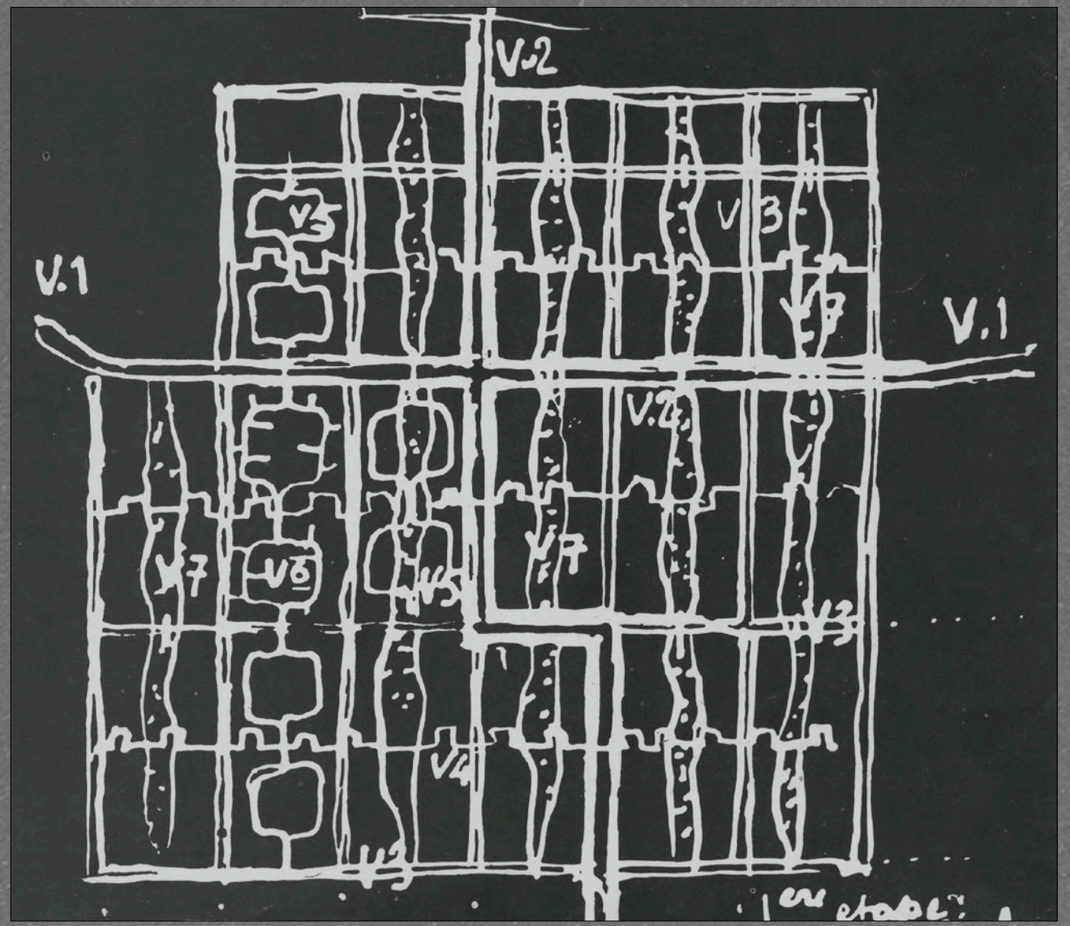
In spite of Le Corbusier's unwillingness, Thapar and Varma **continued their search** and found themselves with **no one left to interview**. By coincidence, **Thapar met an old friend**, a **documentary film producer**, to whom he mentioned his problem. This friend **suggested the architects Maxwell Fry and Jane Drew**, who **became immediately interested** when the **Chandigarh project was outlined to them**. **Especially enthusiastic was Jane Drew**, who **quickly overruled her husband's misgivings** about abandoning their **London practice for three years**. **Both the Frys** felt it desirable that **Le Corbusier be somehow brought into the project**.

The agreement ultimately signed in November 1950 provided a **three-year contract** under which **Maxwell Fry, Jane Drew, and Pierre Jeanneret** would serve as **senior architects in Chandigarh** at a **salary of 3,000 rupees a month ($630)**. **Le Corbusier** would serve as **architectural adviser** with a **salary of £2,000 a year plus 4% of the cost of any building he designed**. He was to **make two annual visits**, with **furnished transportation and an allowance of 100 rupees per day** for expenses.

On **February 18, 1951**, **Le Corbusier left by plane for Chandigarh and Shimla**, where he **examined the site of the new city** and **met with Jeanneret and Fry** to **confer about the master plan**.

LE CORBUISER : MASTER PLAN

In this section, we explore Le Corbusier's master plan for Chandigarh, which became the definitive blueprint for India's first planned post-independence city. Invited to take over the project after Albert Mayer's departure, Le Corbusier introduced a bold and rationalist vision rooted in modernist principles. His plan was structured around a grid of sectors—self-sufficient urban units—designed for efficient living and separation of functions. Central to the layout was the Capitol Complex, symbolizing governance and national identity. Inspired by his concept of the "Functional City," Le Corbusier emphasized order, hierarchy, monumental architecture, and the harmony between built form and open space. His plan transformed Chandigarh into an enduring example of modern urbanism.



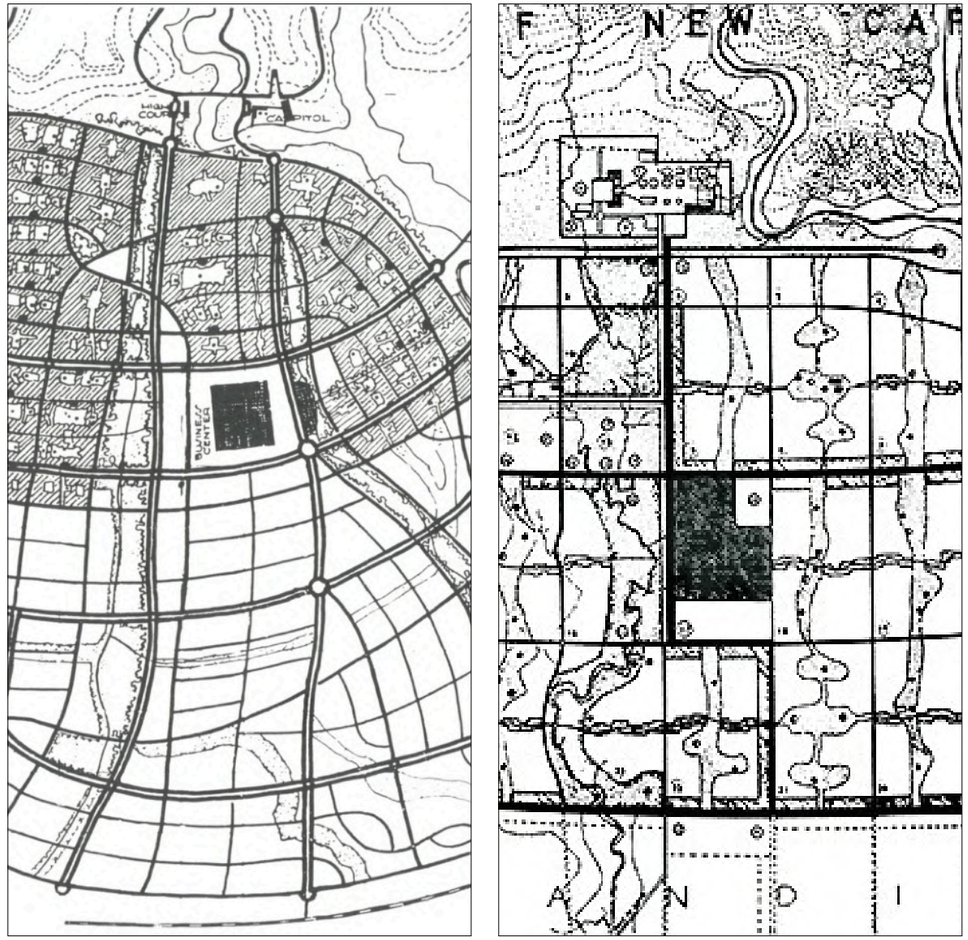
(Fig.81) Architect Le Corbusier's initial sketch for the master plan of Chandigarh captures his vision of a city structured on a clear geometric order. The drawing outlines the grid-based layout with distinct sectors.

Referring on one occasion to the **Chandigarh project**, **Le Corbusier stated**, *"I have conceived a capital for the Punjab, a completely new town, standing on a plain at the foot of the Himalayas. As architect I had a free hand but very little money."*

Whatever **limitations Le Corbusier** may have found in the general program, the fact remains that **only in Chandigarh** was there an **opportunity to see one of his urban plans completely realised**. Almost **30 years had elapsed** since the introduction of his **plan for a city for 3 million people**, which had **startled the Salon d'Automne in 1922**.

The use of high-rise structures would permit the **accommodation of an urban populace**, yet leave **large areas of the ground free** for **park and recreational use**. The **rapid flow of traffic** would be enhanced by the **separation of pedestrian and motor car**. Moreover, by enabling the city to **absorb within its own fabric a large population**, **suburbs and urban sprawl could be eliminated**, creating a **sharp differentiation between countryside and towns**, which had also been the design of the **Garden City planners**. According to the designer, the plan embodied **four basic principles: Decongestion of the centre of cities; Increase of density; Enlargement of main circulation and Enlargement of the landscaped areas. Evidence of these principles** may be seen in **almost all of Le Corbusier's subsequent urban schemes**

Throughout **Le Corbusier's planning projects** may be seen **certain recurring concerns**. Particularly noticeable is an **almost obsessive interest in roads**, which culminated in a system of **traffic separation** termed by the architect, the **Seven V's (Voies de circulation)**. Consistent also throughout his work is the **promotion of modern high-rise construction**, particularly in housing, in order to **free large areas of ground for recreational use**. This found ultimate development in what he once termed **"vertical garden cities"**, groups of **large apartment blocks** like those planned for **Marseilles (1947–1952)**.

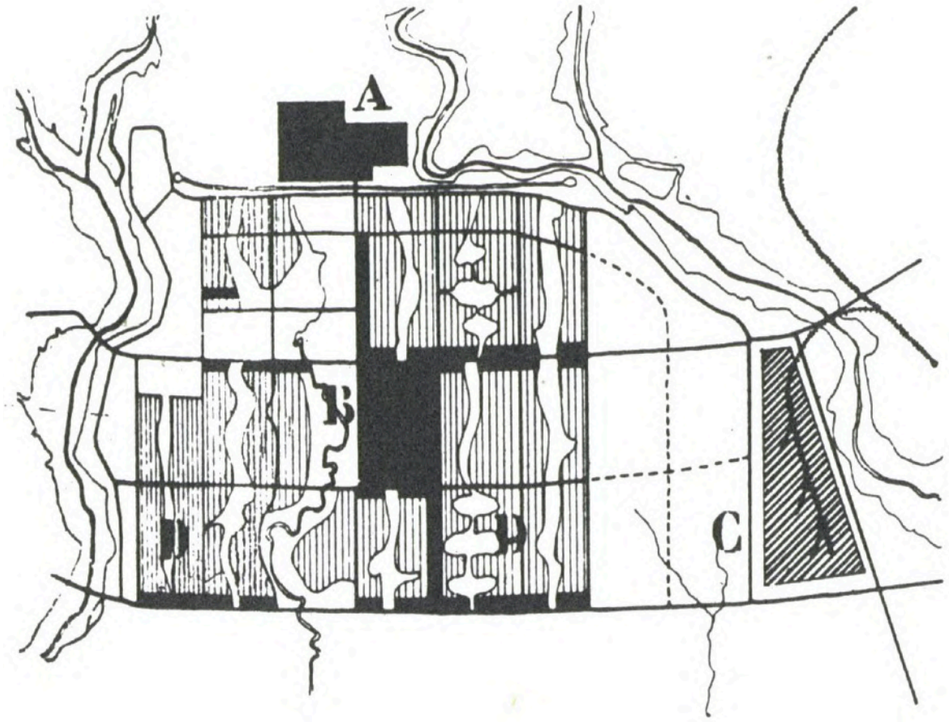


(Fig.82) A fragment of the revised Albert Mayer's plan of Chandigarh (on left) and A fragment of the Architect Le Corbusier's Master plan of Chandigarh (on right) Although evolved from a different philosophy, the present plan of Chandigarh incorporates the major elements of the initial scheme.

For a variety of reasons, **Le Corbusier's large-scale plans**, including several **promising postwar opportunities**, all met with **opposition and failure**, and had it not been for the **imagination of Verma and Thapar**, who **engaged him for the Chandigarh project**, he would not in his life have seen the **full realisation of a single major planning scheme**.

It is readily apparent that **Le Corbusier's assumption of responsibility at Chandigarh** involved more than a change of personalities; **it meant a change of planning philosophy**, and for this reason it is hardly surprising that the **Mayer plan would be subject to modifications** at the hands of the new group of designers. **Architect Le Corbusier's opposition to the Garden City orientation** of his predecessors was a bias **shared by Maxwell Fry**, who once said, *"I have seen in my lifetime an idea of a Garden City embedded into the law of the land with every provision for its promulgation and acceptance, and what came out of it later I have seen also. The idea was not a good enough one and no power on earth could protect it."*

Although **evolved from a different philosophy**, the **present plan of Chandigarh incorporates the major elements of the initial scheme**. The **Capitol complex remains in the same general area**, but in **architect Le Corbusier's plan** is **shifted from the river fork** where **Mayer had projected a series of shallow dams for the Sukhna Choe** in order to establish a **chain of water basins surrounding the complex**. These were **not considered feasible by the second group of planners**, who also **discovered that the ground within the river fork designated by Mayer was lower** than the main adjoining parts of the city. The **new site had the advantage of greater elevation**, thus **permitting the buildings to be more easily viewed against the mountains**. Discussing the location, **Jane Drew explained**, the architects **rejected the old idea of the capital as a government centre surrounded by housing**. The **capital site is at the head of the plan** in a **most impressive yet quiet position**, where it can **fulfil its function undisturbed by the turmoil of the 14 square miles of town**.

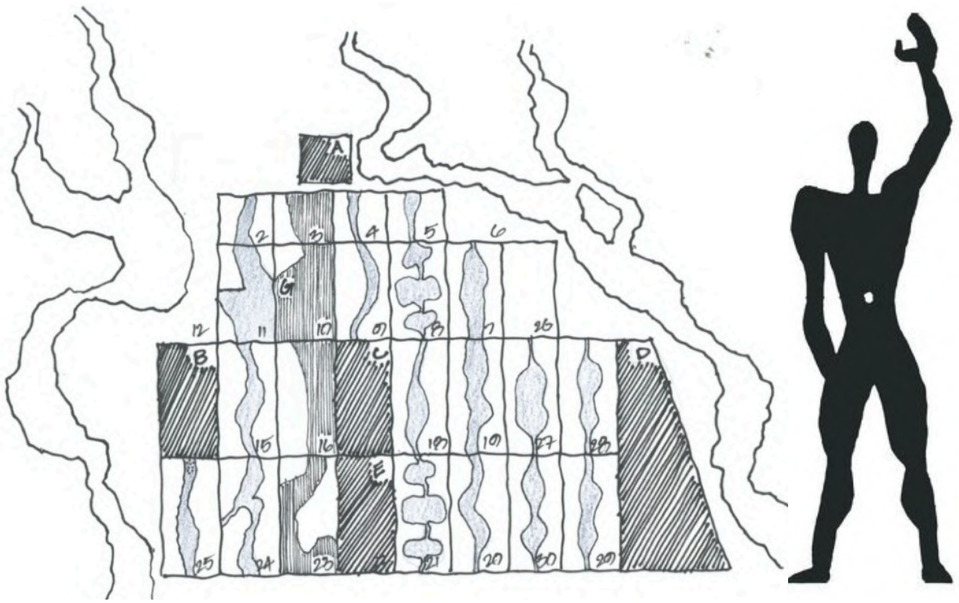


(Fig.83) Architect Le Corbusier's initial phase for the master plan of Chandigarh captures his vision of a city structured on a clear geometric order. The drawing outlines the grid-based layout with distinct sectors, emphasizing hierarchy between the Capitol Complex, city center, and residential areas. It reflects his modernist ideals of functionality, clarity, and harmony with the landscape.

The **central business district** and **industrial area** occupy **roughly comparable positions** in both the **initial and final plans of Chandigarh**, and in both there is **employment of a scheme of traffic separation** integrated with a **basic superblock unit forming the fabric of the city**.

The most striking difference between the two plans is in the **rectilinearity of architect Le Corbusier's design**, a characteristic not unexpected in view of his **predilection for formal, somewhat classical order**. In defending his long-established **preference for geometric ordering**, architect Le Corbusier once stated, *"the circulation of traffic demands direct line... The curve is ruinous... The straight line enters into all human history..."* It should be noted, however, that the **only straight streets are those designed to carry fast through traffic between the city sectors**. **Cutting through each sector is a shopping street following an interrupted path.** In addition, the **urban grid is traversed by a system of irregularly shaped parks** which form a **marked contrast to the geometric open spaces** in Le Corbusier's early civic designs and are meant to contain a **subsidiary circulation system of bicycle paths and walkways** following the curving swaths of greenery. Thus, the scheme, in contrast to some earlier plans, is based not only on **rigid formalism but on functional differentiation**, and the **framework of the city represents a fusion of varied forms**, not an indiscriminate imposition of geometry on nature.

An examination of the **present plan of Chandigarh** reveals, moreover, that the **lateral streets are not perfectly straight**; they exhibit a **slight curve**. It was **Maxwell Fry who convinced architect Le Corbusier** of the **desirability of modifying the grid** in this manner, arguing that on the **flat site of the city**, **straight lateral streets**, lacking the **terminal focus of the mountains to the north**, would have the **depressing effect of seeming to lead nowhere**. It was this belief which had led **Mayer previously to develop an essentially curvilinear street pattern** for the whole city.

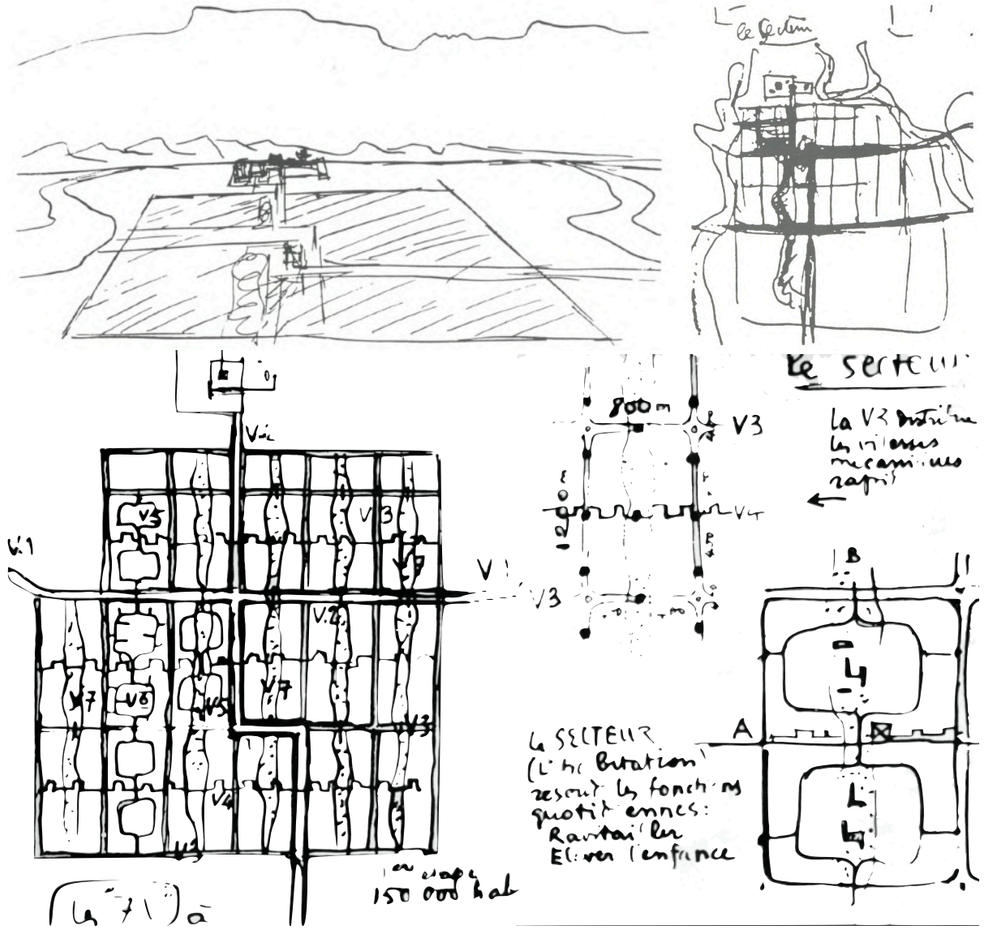


(Fig.84,85) As in the description of Jane Drew, the master plan is almost in its biological form where Head is Capitol Complex (A), Heart is Commercial Centre (C), Right Shoulder contain Universities and Schools (B), Left shoulder is Industrial sector (D), Lungs are Green parks as Breathing spaces, Roads are boney structures and buildings are the Flesh attached to bones as in attached to roads. **(85)** Le Corbusier's modular Human figure.

One cannot say, of course, exactly **how the present plan would look had the Mayer plan not existed**. It would appear quite obvious from the **essential similarities** that the **present scheme was founded on the initial plan**. In spite of the resemblance, however, there is justice in **architect Le Corbusier's claim** that he had **drawn his scheme primarily from ideas developed in his own work during the 30 years preceding the Chandigarh project**.

In describing the Chandigarh scheme, Jane Drew once wrote:

*"The master plan is of **poetic significance**. It is almost **biological in its form**. Its commanding head is the **Capitol group**, its heart the **city's commercial centre**, its hand the **industrial area**, its brain and intellectual centre lie in the **parkland**, where the **museums, university, library, and central market** are located. Its veins and nerves are in the **roads, water, and electricity**. The whole is surrounded by **open country**, but it has its internal lungs too—its **green breathing spaces**. Its structure of roads is the **bony system** to which the **flesh of the building volume** of the city is related. This long simile of the town as an **organism** can be extended even further by the fact that **allowance has been made for growth**."*



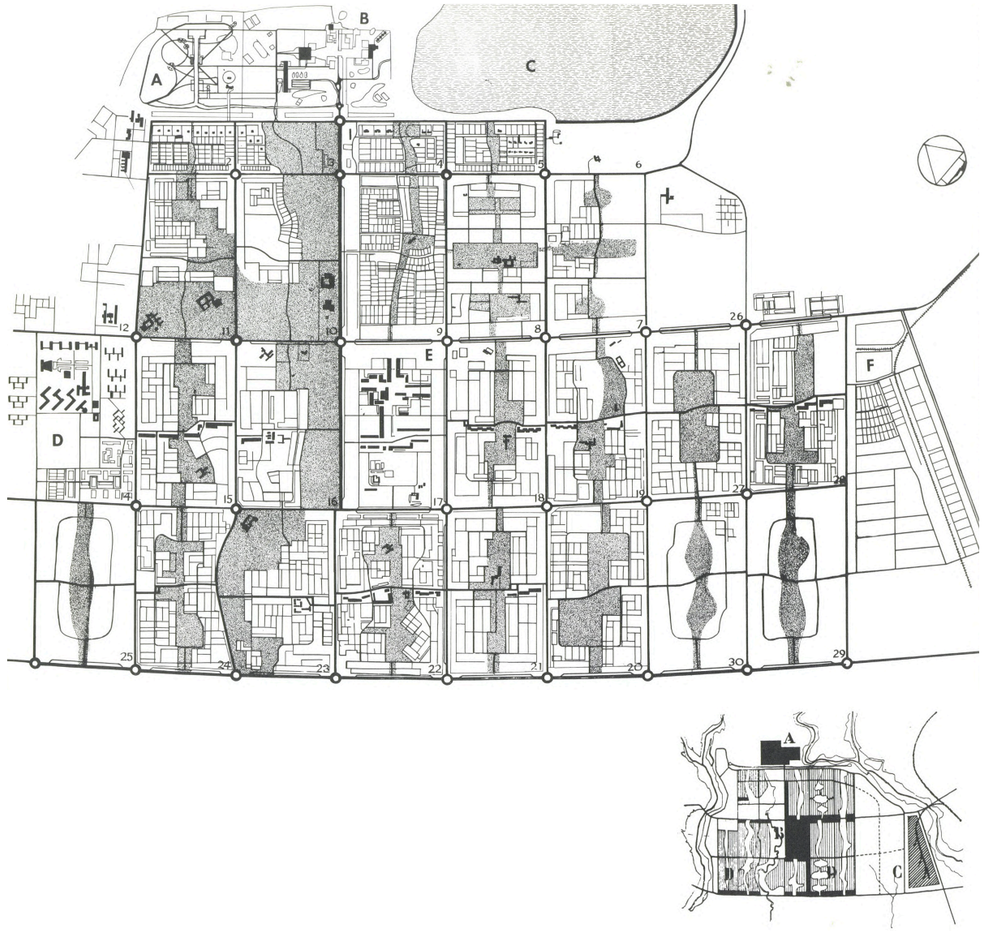
(Fig.86) Architect Le Corbusier's initial sketch for the master plan of Chandigarh captures his vision of a city structured on a clear geometric order. And the great 7V road system.

THE CONCEPTION OF PLAN

Architect Le Corbusier, like the **initial planners of Chandigarh**, was struck by the **expansive sweep of the plain** he was to occupy and the **drama of the distant panorama of hills**. The **mountains feature prominently** in all his early site sketches, **somewhat exaggerated in scale**, and **dominating the broad spread of the plain**.

The city was **conceived in its essential form of a square containing cross axes**, with the **Capitol Complex culminating the north-eastern axis towards the mountains**. This **simple diagram** derives from one of the **oldest forms of urban plans**, and perhaps reflects the **ancient, intuitive gestures by which man takes possession of a place** and **marks it as his own**. What is believed to be the **oldest symbolic representation of a city** is an **Egyptian hieroglyph**, consisting of a **circle containing a cross**. The **rectilinear shape** and **voiding cross-axis of principal streets** was later the **customary form of Roman settlement**.

More significantly, perhaps, this is a **gesture by which all Indian towns were laid out** according to the **ritual codified in the Manasara, Shilpa Shastra**. Once **cardinal points were established**, the **two main streets were laid out in what was termed the cosmic cross**, and the so-called **magic square representing the four quarters of the universe**. The **two streets forming the arms of the cosmic cross** were **broad avenues**, believed to have been **planted with shaded trees**. The **centre of the town**, at the **intersection of the cross**, was the **recognised meeting place of the council of elders**, who regulated local affairs. The **centre**, according to Manasara, was the **auspicious place for an assembly hall or a temple of Brahma**, which had **four entrances**. At **Chandigarh**, the **crossing of the two main streets**—one leading **into the city from the province** and the other forming a **monumental avenue of approach to the Capitol Complex—marks the location of the civic centre** containing the **local administration** and the **central business district**.



(Fig.87) The Detailed master plan of Architect Le Corbusier's Chandigarh captures his vision of a city structured on a clear geometric order. The drawing outlines the grid-based layout with distinct sectors, emphasizing hierarchy between the Capitol Complex, city center, and residential areas. It reflects his modernist ideals of functionality, clarity, and harmony with the landscape.

It is in the **emphasis of the monumental axial composition** that the **second plan of Chandigarh differs most noticeably** from the initial scheme. Although in both designs the **capital area was placed to stand against the mountains**, only in **architect Le Corbusier's plan** was there an effort to provide a **single monumental approach** linking the **body of the city to its symbolic head** and relating along a **single axis** the **two main public areas of the city**—the **Capitol Complex** and the **Civic Centre**. The **ceremonial approach to the Capitol Complex** was projected as a **wide tree-lined boulevard**, bounded on one side by **Parkland** and on the other by **multi-storey buildings—important banks, government offices, and large hotels**.

The **other main street**, **leading from the station**, was designed to **alter its character** when it crossed the **Capital Boulevard**. On the **east side**, extending towards the **station and the industrial area**, it was intended as a **street of commercial depots and headquarters of the business firms**. To the **west**, it would become the **centre of higher education and recreation**, and was to contain, in an **area of parkland**, the **theatre**, **civic museums**, and **sports stadium**. **Terminating this axial street** would be the **university**.

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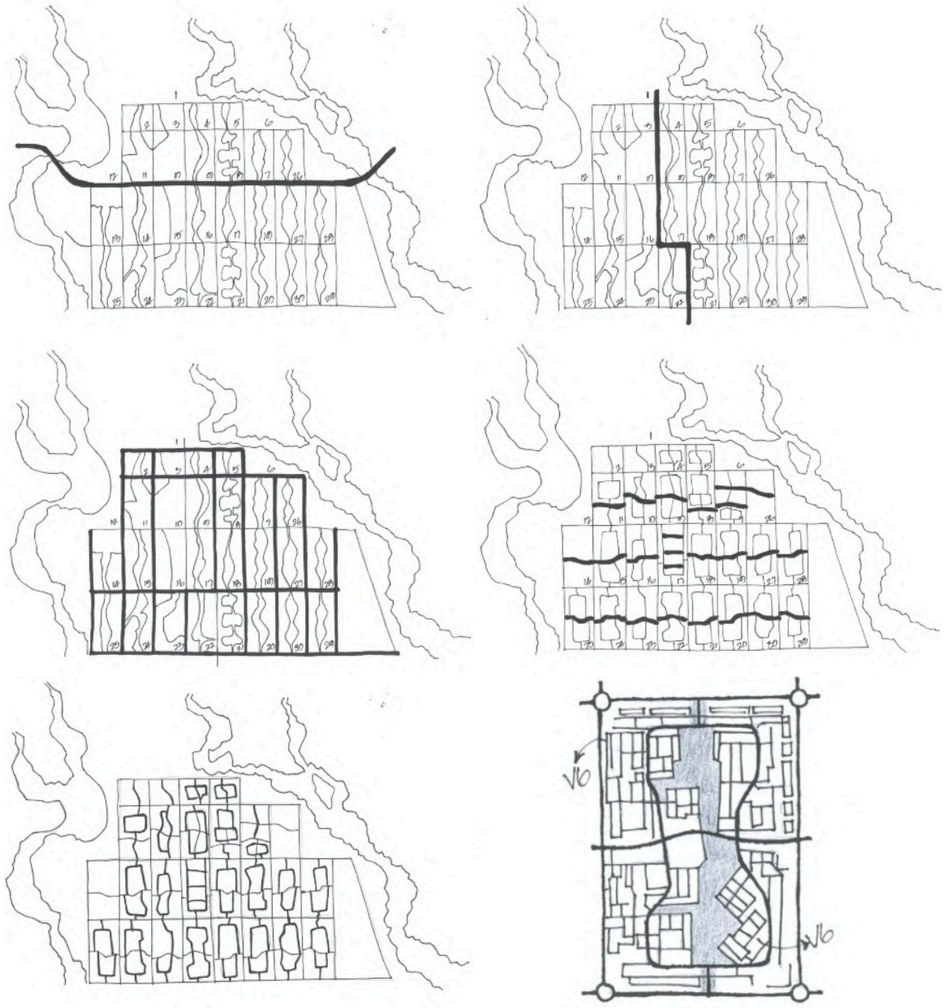


(Fig.88) The 7V system of Architect Le Corbusier for Chandigarh

THE SEVEN V's

Essential to the plan of the city is the **system of traffic separation** based on a scheme of organisation which architect Le Corbusier termed **"les Sept Voies" (The Seven V's)** and which he projected in his **postwar planning schemes for Bogotá and Marseilles Sud**. Although some degree of **traffic differentiation** has always been present in architect Le Corbusier's urban design, the **Seven V's system** represents the architect's attempt to develop a **fully organised, universally applicable system**, establishing a **breakdown of traffic into seven categories** containing every level of circulation from **arterial roads to apartment house corridors**.

The **V1** represents always the **regional highway** leading into the city from outside. In the case of Chandigarh, this would be the **national trunk road** coming from **New Delhi on one side and from Shimla on the other**. The **V2** forms the **main horizontal axis** of the town, intersecting the street leading to the **Capitol complex**, also **V2**. This street borders the **business centre** and intersects at the lower edge of the present city another projected **V2**. The **V2 boulevard**, designed ultimately to employ a system of **separated lanes**, will accommodate **all classes of traffic—fast and slow moving vehicles, cycles, and pedestrians**.

Surrounding the **residential sectors** and forming the **great pattern of the city** are the **V3's**, the streets reserved for **fast-moving motor traffic**. **Access to the city** from these streets is **limited**—there is **no frontage development permitted**. The street is treated, in fact, **as though it were a railway line**, and **walls have been constructed to restrict pedestrian access**. The **sector is thus planned to focus internally**.

By setting is set to V4 are shopping street. This street, intentionally opened to a variety of traffic but **permitting only delayed or slow movement**, would **supply the needs of the sector** in the way of **shopping and tradesmen's services**. **Shops would be located only on the shady side of the street** for comfort and to **elimi-**

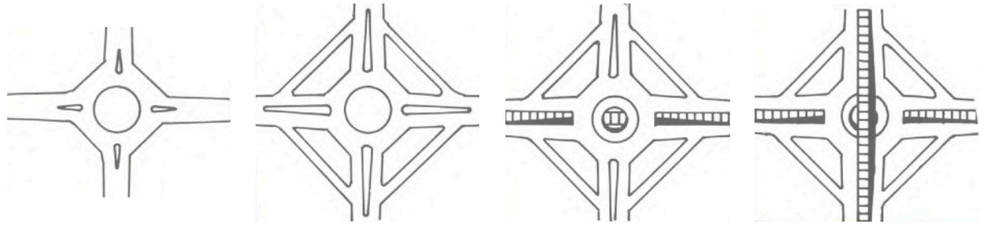


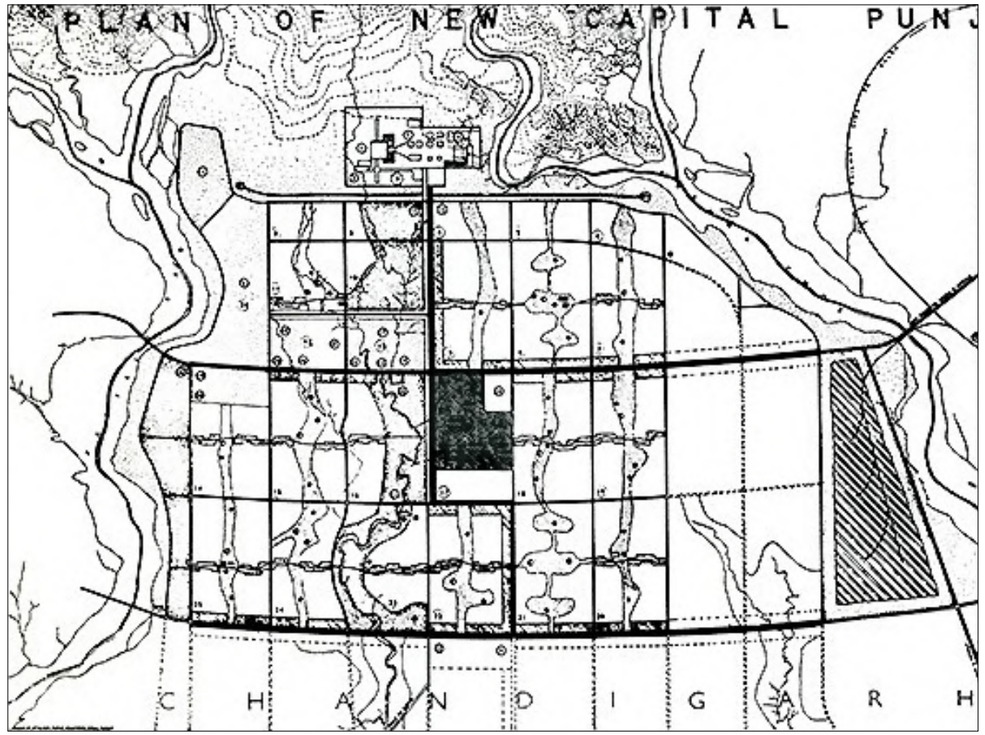
Figure.1 : The revised Albert Mayer's plan of Chandigarh, 1950 (From "Chandigarh, The Making of an Indian City" by Ravi Kalia, 1987) The black square is the city center. The idea that the city is divided into super blocks with green belts was succeeded by Le Corsbusier.

nate the necessity of frequent street crossing. It may be noted that in the **V4 the geometric grid is replaced by a somewhat irregular street**. When he devised the Seven V system, **architect Le Corbusier termed the V4 as the "'rue Vivante par excellence,' la Grand' Rue of tradition."** Ultimately, the **V4 would pass underneath the V3 road to connect** with its counterpart in the adjoining sector.

Interfering in the V4 at two points would be V5, a **loop road distributing slow traffic** within the **confines of the sector** and **connecting with the adjoining sector**. Thus, **fast traffic could move throughout the city on the V3 roads** and **slow traffic on the V4 and V5 streets**. The **extremities of the network are the V6 paths leading to the doors of the houses**. The **V7 paths**, "**dedicated to youth and to communal sports,**" are designed to **carry pedestrians and cyclists through the park beds** of the city, which **contain the school and playing fields**. These **paths would also go underneath the V3 roads and link sectors**, thus making it **theoretically possible to traverse the entire city on foot through a park**.

Playing his favoured biological interpretation to the road system, Le Corbusier said,

"The 7V's act in the town plan as the blood stream, the lymph system and the respiratory system act in biology. Biology, the systems are quite **rational**, they are **different from each other**, there is **no confusion between them**, yet they are in **harmony**. They **create order**. **It is God who has placed them in the world**; it is for us to **learn from them**, when we are **organising the ground which lies beneath our feet**. The **7V's are no longer sinister instruments of death**, but become an **organised hierarchy of roads** which can **bring modern traffic circulation under control**."



(Fig.90) The cities landscape runs vertically passing through all the sectors giving breathing spaces and pedestrian friendly green parks in each sector, the landscape runs towards south through all the sectors.

THE LANDSCAPING OF THE CITY

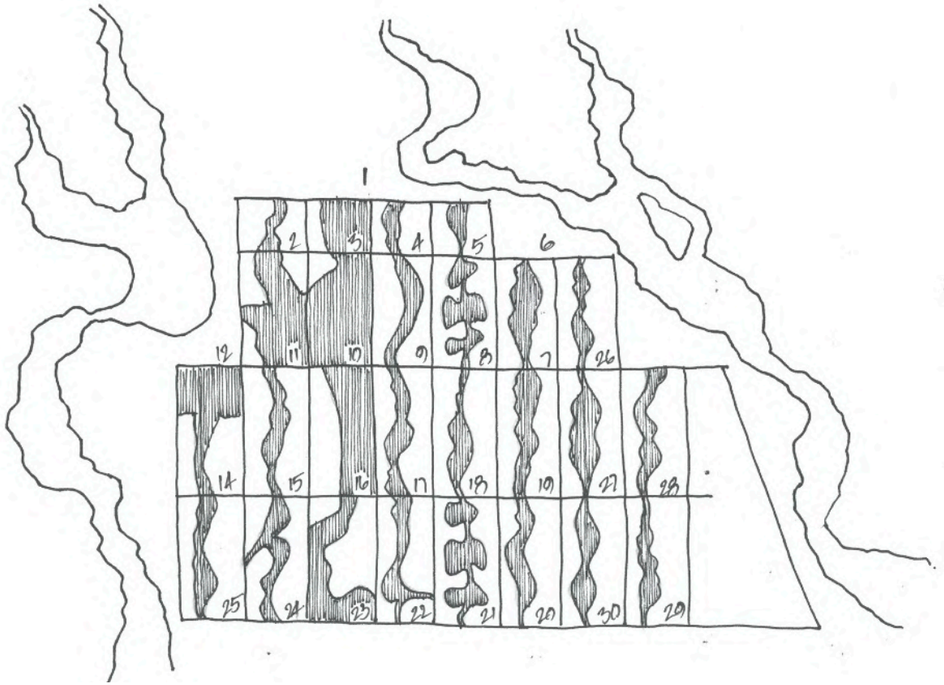
As suggested by **architect Le Corbusier**, a **chart was prepared** showing **shades of local trees** and **clever colours** in order to aid **selection of types suitable for the varied use of city planning**. **Urban elements requiring distant landscape treatment** were given **three classifications**: the **roads**, the **urban spaces** that **landscape but work closely with architectural elements** such as the **Capitol Complex** and **commercial areas**, and the **free spaces of the parks**.

The **V2 and V3 roads** were considered in relation to their function as **arteries for fast moving traffic**, and the **foliage pattern** was planned in accordance with **bearing sun conditions**. In general, for an **autoroute**, a **single or double row of trees with high foliage** permitting a **wide sweep of vision** was considered appropriate.

It was discovered, however, that during the **winter months** the **lower copper sun** would send its rays directly along the **northeast–southwest axis** of the **V3 roads**, and it was felt that here a **pattern of trees bearing dense permanent foliage**, which could be trained to form a **low tunnel of greenery**, would be more suitable. This **differentiation in planting** could also eventually serve as an **easy guide to tell motorists the direction of their travel**.

The **V2 leading to the Capitol Complex**, in its **ultimate development**, would carry **two separated lanes of auto traffic**, beyond which would be **bicycle strips**, a **parking lane**, and a **pedestrian sidewalk** bordering a line of **office buildings and shops**. The **landscaping scheme** for these streets would provide **high trees to demarcate the roadway** and a **variety of leafy shade trees for the pedestrian area**.

The **V4's or shopping streets** were intended to convey an **individual quality of urban liveliness**. To give a **separate character to the streets**, each **V4 would be planted with a different colour of flowering trees**, as well as with **other trees**.



(Fig.91) The cities landscape runs vertically passing through all the sectors giving breathing spaces and pedestrian friendly green parks in each sector, the landscape runs towards south through all the sectors.

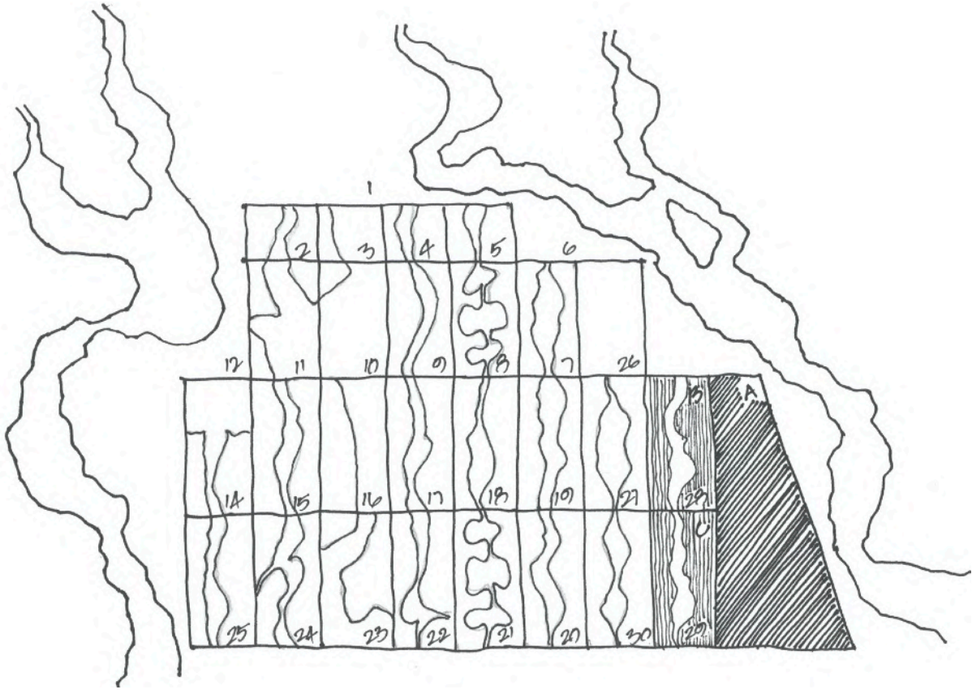
THE PARK AREAS

The **most important part area in the city** is that developed in the **eroded stream bed** running through the city. This area, termed by architect Le Corbusier the **Valley of Leisure**, contains a **gorge five to six meters deep** which varies in width from **one hundred to three hundred metres**. To architect Le Corbusier, *"six meter below the ground is enough to create an atmosphere of solitude and complete isolation."* An additional **civic recreation area** was developed as a result of **damming the Sukhna Choe** to create an **artificial lake** in the area to the east of the Capitol Complex. This dam formed an extension of the **Capitol Boulevard**, a street christened by Le Corbusier **"Boulevard des Eaux"** at a time when many predicted **there would be no water at Chandigarh**.

The **establishment of the lake** was, in fact, one of the **most admirable aspects** of the **plan of Chandigarh**. Surrounded by a **flat dry landscape**, this **body of water** creates a remarkably **refreshing start** towards the **mountains rising rose and lavender** beyond its **blue expanse**. The very **sight of a large body of water** in the **arid dust-laden heat** of Chandigarh is a **blessing and solace** which can only be appreciated through **experience**, and for this reason it is unfortunate that the **creators of the lake** did not give the **city greater access** to it.

Although **not a part of the original plan**, a **park has subsequently been projected** for the area to the **northwest of the capital complex**, a stretch of land which at the present time forms part of a **great thrill is playing** sleeping towards the **mountains**.

In addition to the **major park areas**, there are, of course, **park babes** running through the **residential sectors** and furnishing **local recreation areas** and **sites for schools and community buildings**.



(Fig.92) The Industrial area is thoughtfully located near the railway station separated form city and sectors next to industrial area were basically the residential sectors designed for the purpose of workers who work in Industrial areas.

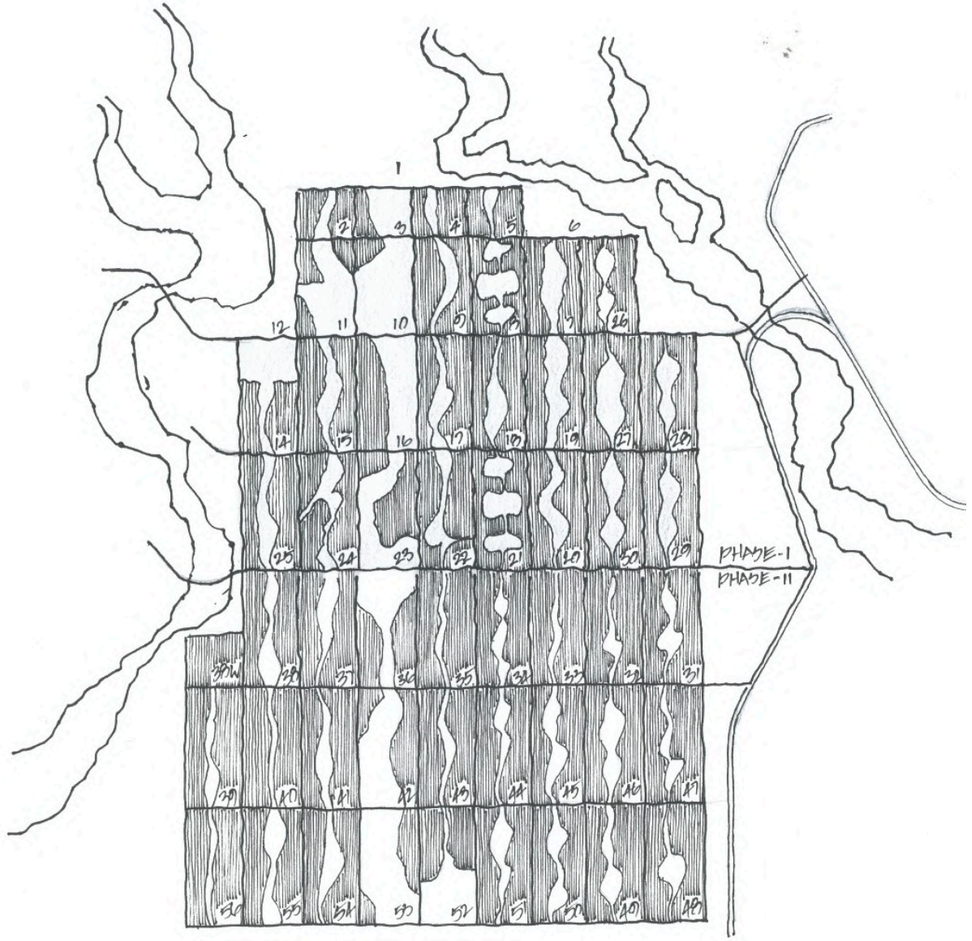
THE INDUSTRIAL AREA

As in the **Mayer plan**, it was proposed to **separate the industrial area** from the **residential portion** of the city with a **buffer area of trees**, **fruit trees** being considered desirable for this purpose as a **potential source of raw material** for some of the industries. **Architectural controls** were **established** regarding **site coverage** and **materials of construction**, ultimately requiring all **plants to be formed in consultation** with the **Capital Project Office**. It was assumed that **employees of the Chandigarh industrial firms** would find **residence within the city**, and eventually **Sectors 28 and 29** were set aside for the **industrial housing**.

PERIPHERAL CONTROL

In order to **control the development within the borders of the city**, the **Periphery Control Act of 1952** was introduced which gave the **planners of Chandigarh** the **powers to regulate development** within a **five–mile limit beyond the city**. The purpose of such control was *"to prevent the creation of bad semi-urban conditions and city boundaries, drawing away the strength of the city by unfair competition immediately beyond the area of local taxation."*

The **establishment of additional towns and villages** in the **area around Chandigarh** was **prohibited**, and, although **specific areas** were established where **brick fields and lime kilns** were permitted, **no other commercial or industrial development** of the **adjoining areas** was to be allowed. Thus, the **new city** would be surrounded by a **permanent green belt**.



(Fig.93) Chandigarh city is developed in two phases, where the initial phase, phase one has 30 sectors which was designed by Architect Le Corbusier and phase 2 for later development.

THE SECTORS

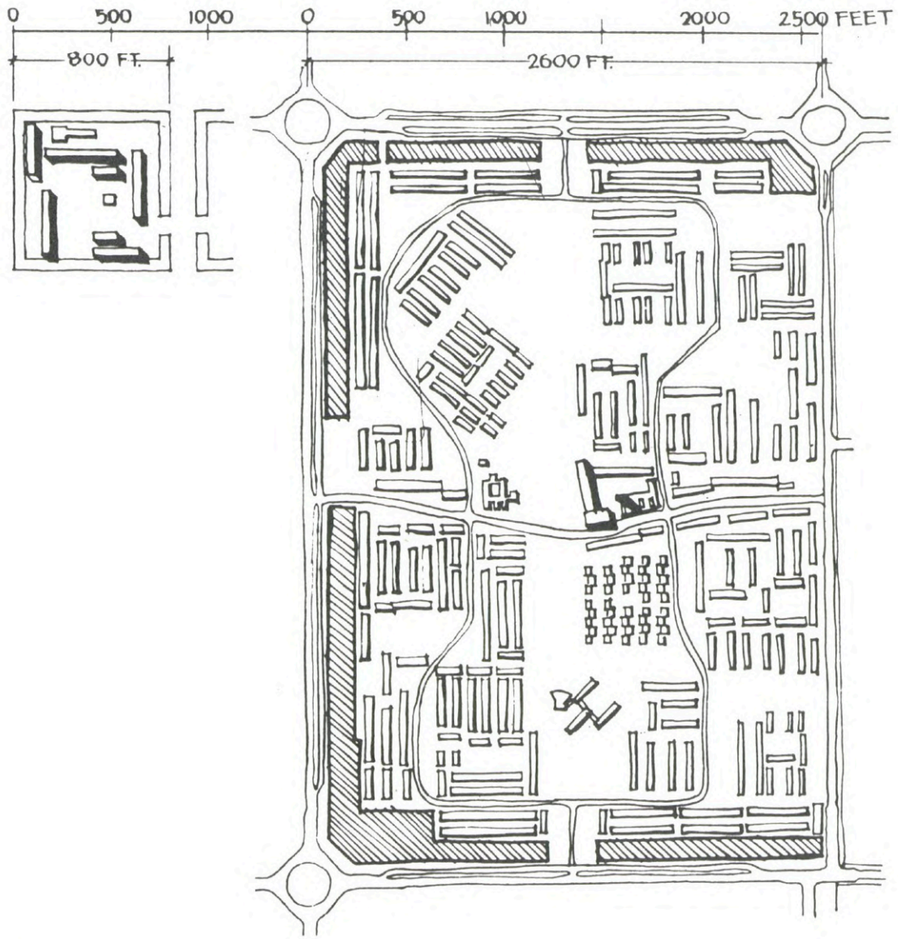
It has been noted previously that the **neighbourhood unit** represents a **planning device**, tracing its precedents to the **work of Clarence Stein**, who was associated with the **initial plan of Chandigarh**, and in the early urban schemes of **architect Le Corbusier**. Essentially, the **neighbourhood unit** is an attempt to create within the **modern city physical and social units** of **smaller**, and in the eyes of many planners, **more manageable size**.

The **neighbourhood sector** could provide for the **systematic distribution** throughout the city of **educational, recreational, cultural and commercial facilities**, enabling citizens to find **most of the needs of daily life** within **easy reach of home**. This has been considered of particular importance in the case of **children**, who require **convenient access** to **schools and playgrounds**, preferably **without having to cross dangerous motor traffic**.

The **earliest defining version** of the **neighbourhood unit**, appearing in the writing of **Clarence Perry**, used the **elementary school** as the **determinant for neighbourhood population**.

In addition to the **physical convenience** of **proximity of community facilities**, the **neighbourhood unit** is considered desirable in the eyes of many as a means of providing opportunity for a **greater degree of social interaction** than might be easily attainable **within a large city as a whole**. To a certain extent, the **social aspects** of the neighbourhood unit idea are based on an **ideal of small town life** with its **strong sense of community**, a sense of **social unity** generally assumed to have been weakened within the **modern city**.

In India, there has been, of course, a long tradition of **caste waters** in cities, in which a **social identity** of **religion, customs, and occupation** would be reinforced by **physical containment**, creating, in essence, **small homogeneous towns within cities**.

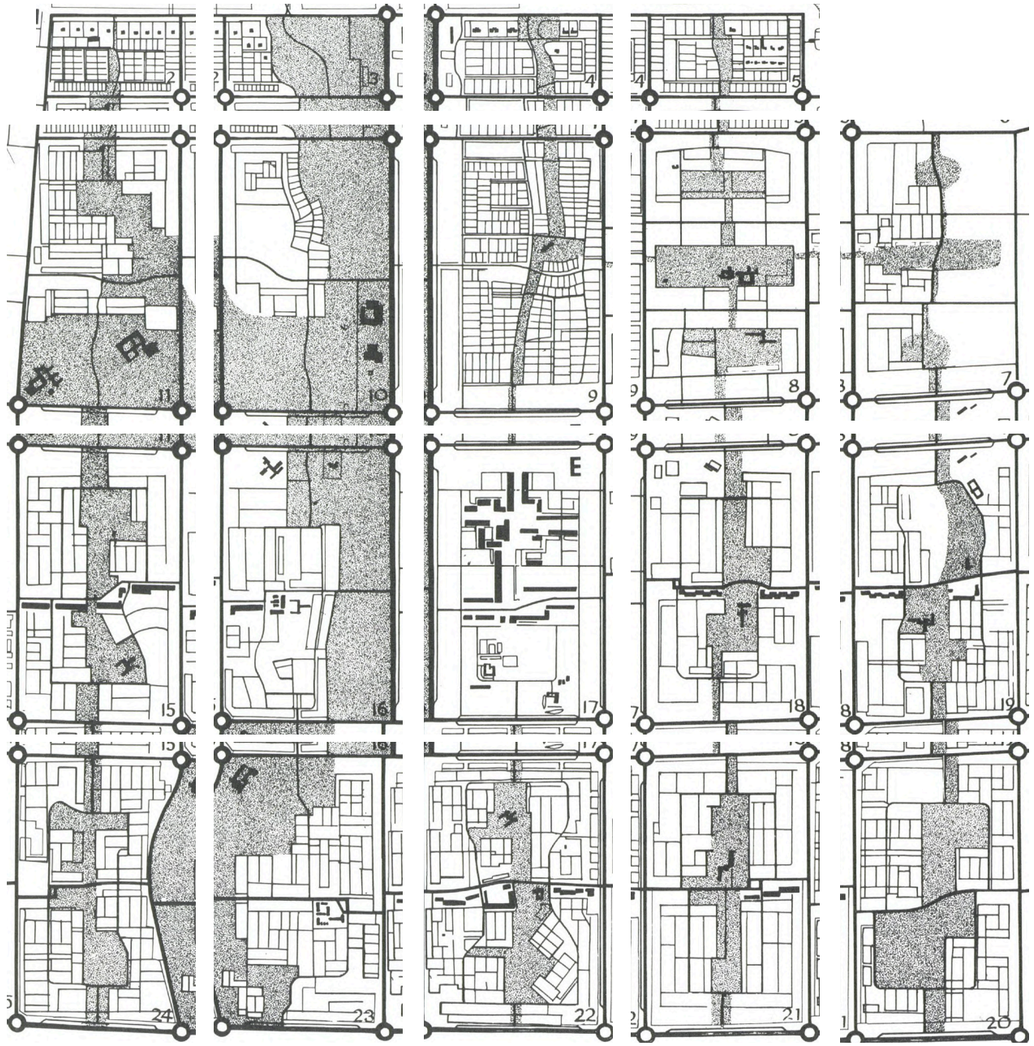


(Fig.94) Sector 17 the sector developed after the approval of Master plan

In **Chandigarh**, however, the **neighbourhood unit** would have **no social base other than a general similarity of income**. As a **government city**, Chandigarh would draw its population from **many parts of the provinces** and from **varied social groups**, with **housing assigned according to occupational rank**. Thus, Chandigarh would of necessity provide for a greater **juxtaposition of caste, language, and religion** than might be found in a typical Indian town, a factor which might **mitigate against the development of strong community centres within the sector**, which could also help to **break down many of the traditional barriers** which for centuries have isolated Indians from one another.

In the initial plan of Chandigarh, it may be recalled, **Albert Mayer developed a grouping of three super blocks which he termed a district, containing about 3,500 families in an area averaging about 25 acres.** It was also proposed to include within the super blocks **small groupings of about 150 houses which would create population units roughly equivalent to the size of a typical village.** The sector units of the present plan, **rectangular in plan and 1/2 mile x 3/4 mile (800 x 1200 meters) in dimension, enclose an area roughly equivalent to that three-block district of the Mayer plan, with total sector populations ranging from 5,000 to 15,000.** The Albert Mayer plan had a **stable** list of **three main income groupings for the super blocks,** and this pattern was generally followed in the present plan which employs **three main density groupings of 25%, 50%, and 75% per acre.** The **upper-class sectors contain a residential pattern of detached houses within ample grounds, producing the lowest densities of the city,** while the lower-income levels are provided **terrace housing on small plots, necessitating the highest densities.**

As mentioned previously, **efforts were made to provide for a certain amount of social mixture in Chandigarh**, and, according to the planners, **every attempt was made to see as far as possible that it does not get divided into watertight compartments of various classes of society.** By the distribution of **civic amenities**



throughout the city, moreover, it was hoped that Chandigarh would develop more or less evenly, without the popularity of one part of the city developing at the cost of another.

Although **no two sectors are identical**, all follow the **same basic plan**: each contains a **Central Park band** and is bisected by the **Bazaar Street**. Intersecting the Bazaar Street is an **interior Loop Road** serving as the **principal distributor of traffic within the block**, and from this street, branches give access to **housing groups**. Within the somewhat irregular street pattern of the sector, **groups of building plots are laid out**. The only variation in this basic pattern is in **sector 7 and sector 8**, which have been planned as **triple units based on Albert Mayer's conception**, and these sectors are reserved for **special purposes such as educational institutions**.

Each sector is **designated by number**, the **capital complex being number one**, with the remaining sectors **numbered consecutively beginning at the north corner of the city**. After the initial designation of the sectors, the **area of city development was expanded toward the east**, and **new sectors were added**, resulting in certain **irregularities in the sequence**. At the first phase of the project, there were **30 sectors in Chandigarh**, of which **24 are residential**. As in the floor designations of many New York office buildings, the **number 13 has been avoided**. And at present, there are **56 sectors.**

It may be noted that the **sectors at the upper edge of the city are of abbreviated size**. This is because the **capital complex is contained within the boundaries of sector 3 extended to its full dimension**, and the **uniqueness of its function is therefore underlined by the deliberate curtailment of nearby sectors**. Thus, the **sector arose as part of the functional differentiation of the city** and, integrated with a system of traffic separation, **was to constitute a residential unit within which all activities of daily living could take place**. To this end, the sector as planned would contain not only **housing but also local shopping facilities, schools, and community buildings**.

CONCLUSION

At the time of its inception, the physical design of Chandigarh, as seen in both the initial and final schemes, represented almost a summation of many generally accepted principles of civic design. The functional differentiation of civic areas, the systems of traffic separation, and the establishment of the presidential superblock unit all formed part of the vocabulary of urban design which had been developing from the 1920s, and which would come to be repeated in the number of other post-work projects.

In the adoption of the Albert Mayer plan by architect Le Corbusier, most of the general features were retained. The general site remained the same, and the superblock principle was incorporated, although the individual blocks were enlarged and regularised. (the single sector in architect silicon users design covers an area of about 25 acres, approximately that of the three block district land by Albert Mayer.) The Capitol complex remained sighted at the upper edge of the city but shifted slightly to the north-west to the higher ground, while the central business district, railroad station, and industrial area continued to occupy roughly similar positions in both plant.

The primary changes introduced by architect Le Corbusier there were in the geometrization of the plan with its adoption to a comprehensive monumental ordering, and it is in this that a difference in total conception of the city maybe seen. The generating element of the Albert Myers plan appears to have been the residential neighbourhood, the urban form essentially an accumulation of small-scale elements, with a carving street pattern representing the designers decide to avoid what he felt to be rigidity monotony of geometry grade.

Although the Indian officials of Chandigarh had originally been completely satisfied with the Albert Myers plan, it may have been the added qualities of monumental or vanity which moved them to accept which such rapidity the changes proposed by the second group of designers. Although the initial plan exhibited humane and tarot going designed to provide for the intimate textures of city life, the Indians may not have shared Albert Myers preoccupation with the living environment or felt much concern for the ideas motivating his plan.

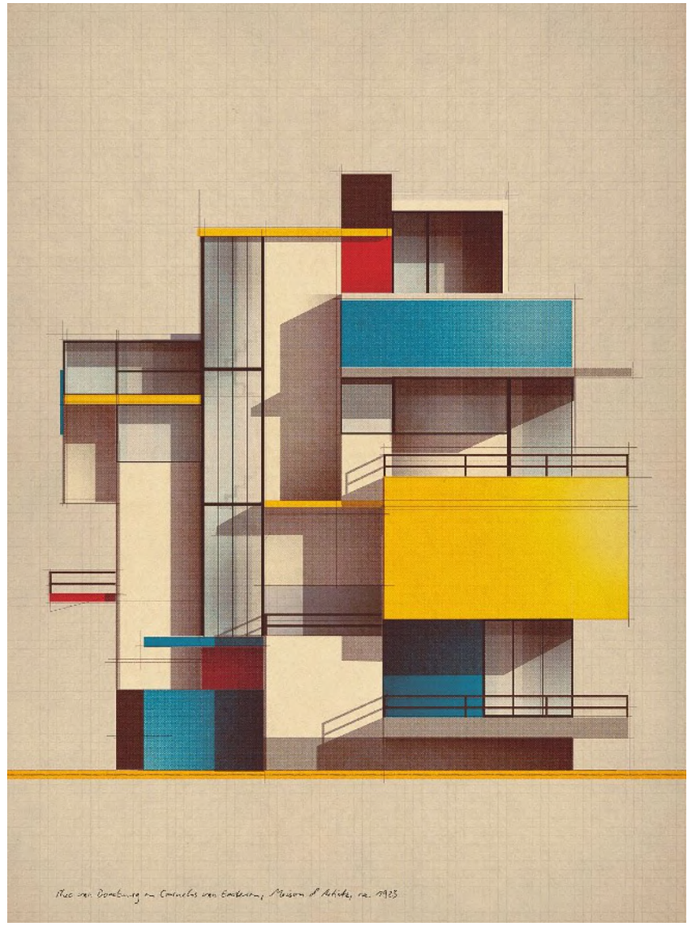
It is certainly doubtful that architect Le Corbusier began his design with any qualms about expressing himself or hesitancy in advancing his views, and it may be possible that his unwavering self-confidence and conviction in the validity of his own ideas brought strength of purpose which the Indians needed to bolster their unsureness and confusion.

A city after all is many things a seat of exchange, a place of residence, a cultural centre, and administrative headquarters. A great city, however, is more than the sum of it utilitarian functions, and this is particularly true of a capital city which does not merely house government activities but also serves as a symbolic distillation of a society and a focal point for its members.

As a simple diagrammatic outline of the city and as a guide for future, more intensive planning, the master plan had much to recommend it. Although not precluding the creation of variety and flexibility within the sectors, the basic layout of Chandigarh established a clear and logical framework within which the more intricate drama of the city might subsequently unfold. The easily comprehended scheme was linked to some of the oldest traditional urban forms of both East and West, and could be seen to embody the conviction of the architect that “the sprit which animates nature in a sprit of order.”

MINIMALISM

In this chapter, the focus is on *Minimalism* in architecture, particularly the concept of open planning systems. Minimalism emphasizes simplicity, clarity, and spatial openness, reducing architecture to its essential elements. As a key case study, Ludwig Mies van der Rohe's **Farnsworth House** is explored for its radical use of transparency, structural honesty, and seamless indoor-outdoor connection. The chapter examines how such minimalist approaches influence spatial experience and inform contemporary design thinking.



(Fig.95) :
MANSION D' ARTISTE (unfinished) by T*heo van Doesburg and Cornelis van Eesteren.*

Maison d'Artiste an Unfinished Icon by De Stijl, by architect Theo van Doesburg and Cornelis van Eesteren, was **intended to encapsulate what De Stijl aspired to**: a new everyday environment achieved through the harmonious fusion of painting and architecture

(Fig.96) :
Portrait of architects *Theo van Doesburg and Cornelis van Eesteren.*

3. MINIMALISM IN ARCHITECTURE

3.1 ORIGINS OF MINIMALISM

Minimalism has been highly influenced by Japanese traditions, particularly *Zen Philosophy* and *Haiku poetry*. The Zen concept is often integrated into aesthetics and architectural design, promoting simplicity as a reflection of freedom and the essence of life. Simplicity, in this context, is not merely an aesthetic value but also a moral perception. It seeks to uncover the truth and reveal the inner qualities of materials and objects, emphasising their essential nature.

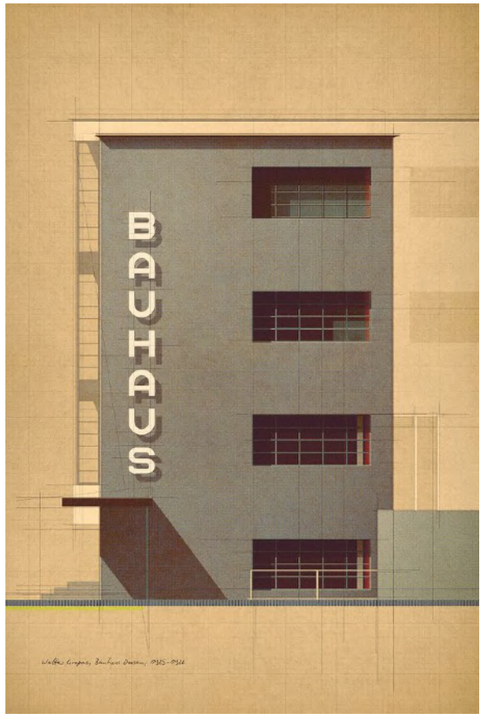
Another significant influence on minimalism is *Haiku poetry*. As noted in Tanizaki's writings on the aesthetic of silence, Haiku embodies the minimalist approach. These three-line, seventeen-syllable poems (structured as 5-7-5) convey profound meaning with just a few carefully chosen words. Despite their brevity, Haikus open up endless possibilities for interpretation and imagination, encouraging personal reflection. Like Zen, Haiku is open-ended, focusing on simplicity and depth while expressing only what is truly necessary.

In traditional Japanese aesthetics, *Wabi-Sabi* also plays a key role in minimalism. It is a philosophy that embraces the beauty of imperfection, impermanence, and incompleteness, values quality of simple and plain objects. It appreciates absence of unnecessary features to view life in quietness and reveals the most innate character of materials.

3.2 INFLUENCE OF MINIMALISM IN ARCHITECTURE

The influences for minimalism in architecture are diverse, drawing inspiration from movements such as *De Stijl* (Dutch for "The Style") of 1917 and the *Bauhaus* of the 1920s. The works of *De Stijl* artists especially from *Piet Mondrian* are consid-

(Fig.97) :
CAFE DE UNIE by Dutch architect J.J.P. Oud, Rotterdam, Netherlands. **Inspired from De Stijl movement.**



(Fig.98) :
BAUHAUS school by architect Walter Gropius, Weimar, Germany. **The most influential school in revolutionising modernism in architecture.**

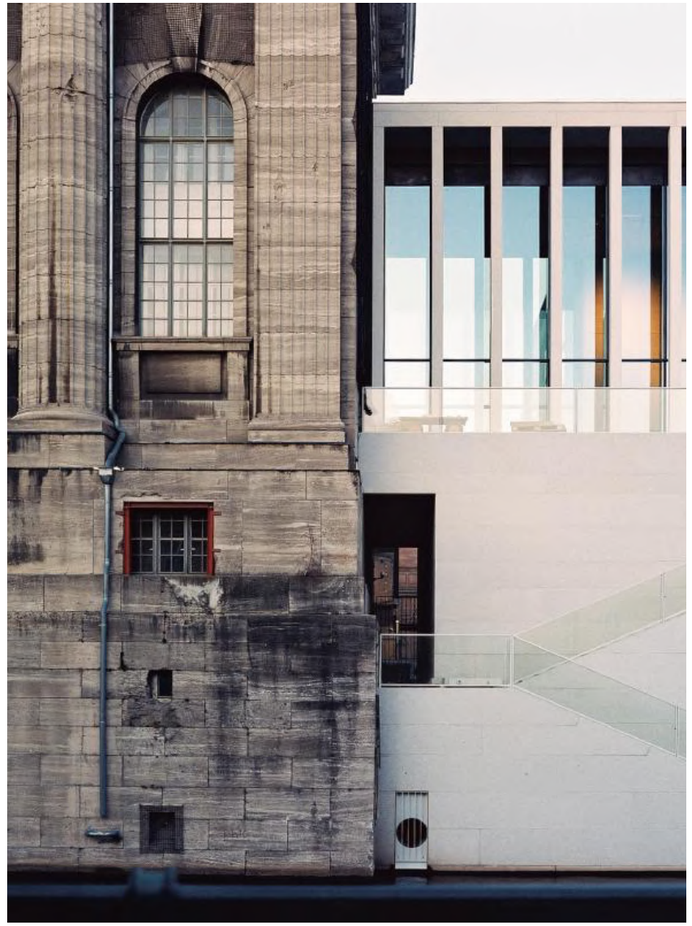
ered a major reference point. This movement expanded the ideas of expression by meticulously organising basic elements like lines and planes. In architecture, the third dimension adds a unique aspect to this philosophy, where horizontal and vertical elements can overlap in some plans and diverge in others. Architects like *Theo van Doesburg, Gerrit Rietveld and Jacobus Johannes Pieter Oud (J.J.P Oud)* applied these principles through a design philosophy rooted in functionalism, the absence of surface decoration, and the use of rectilinear planes.

The *Bauhaus* approach was closely linked to the *De Stijl* movement, sharing principles of functionalism, cleanliness, reduced forms, and purity. The *Bauhaus school*, founded in 1919 in Weimar, Germany, by architect *Walter Gropius*, was the most influential art school of the 20th century. Its name, meaning "house of building," symbolised its goal of uniting Fine Arts and Applied Arts in perfect harmony.

The philosophy embraced by the *Bauhaus* prioritized simplicity, rationality, and functionality, forming a revolutionary modern approach to design and art. This approach emphasised the use of primary colours and simple geometric shapes, creating a distinct and iconic aesthetic. Everyday objects, furniture, and even buildings followed the "less is more" philosophy, ensuring that functionality remained the highest priority while producing the timeless aesthetics we now recognise as modern design.

3.3 IMPORTANCE AND CHARACTERISTICS OF MINIMALISM

A key question in minimalist architecture is: How much can a form be simplified and reduced without losing its purpose and identity? Minimalism encourages designers to remove unnecessary elements while keeping the essence of the space intact. It emerged as a popular lifestyle choice in the 1980s, especially among wealthy individuals who felt overwhelmed by consumer culture. With their living spaces filled with unnecessary items, people became tired of the clutter and visual chaos brought on by mass consumerism. This led many to seek calm, uncluttered



(Fig.99) :
NEUES MUSEUM by David Chipperfield, Berlin, Germany.

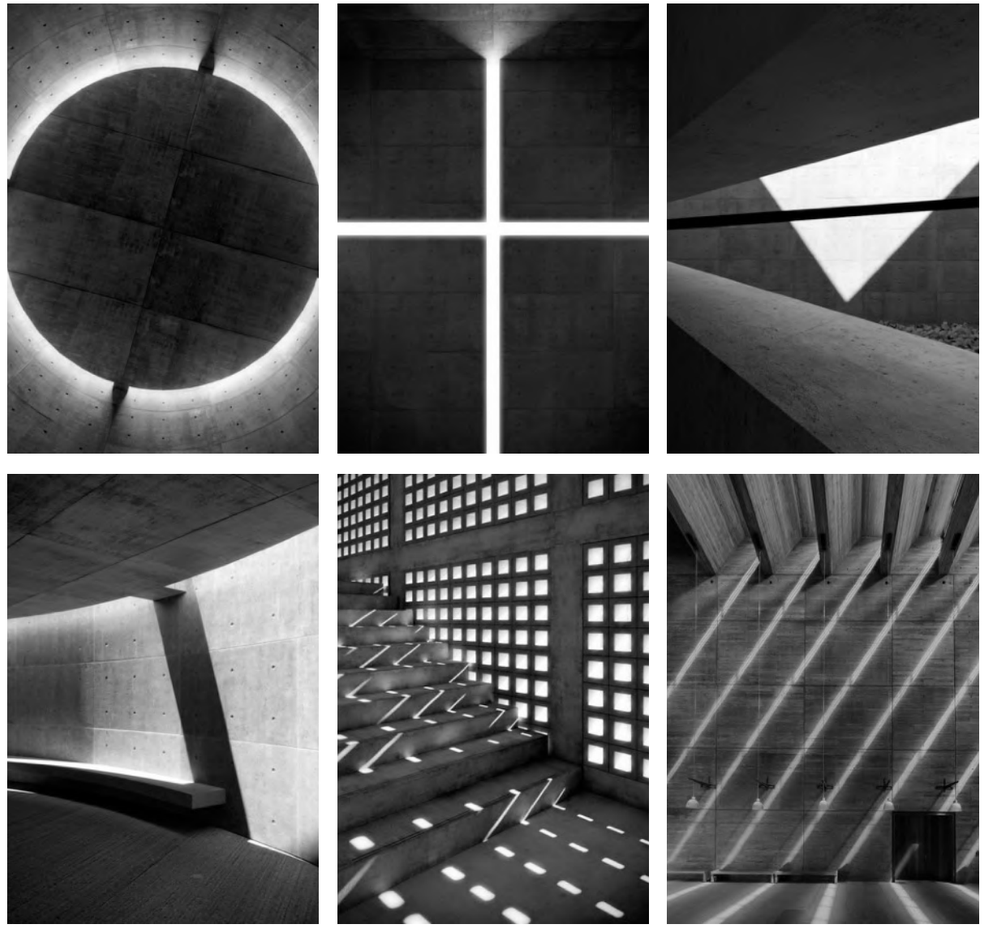
The **Neues Museum** in Berlin, restored by David Chipperfield, seamlessly blends historic preservation with modern minimalism, using simple materials to complement the original 19th-century structure. **The design emphasizes subtle contrasts between old and new.**

environments that offered a sense of peace away from the “visual noise” of everyday life.

The drive to reduce forms to their essence aligns closely with the principles of industrial manufacturing and design. Basic shapes, a limited colour palette, simplified lines, and clean, flat surfaces replace excessive decoration with a focus on simplicity and functionality. These streamlined forms are also well-suited for modular fabrication, making industrial manufacturing more favourable than handcrafted production. Industrial advances in the mid-20th century laid the foundation for a new aesthetic in architecture, one that embraced minimalism as a form of modern expression. Today’s minimalist architecture is arguably purer than ever, thanks to technological and material innovations that allow for sleek, precise designs. Minimalist aesthetics also have a strong commercial appeal, a the clean and uncluttered spaces naturally draw consumers' attention to showcased items within them.

Minimalism in art and architecture represents a fresh way of thinking and a lifestyle shift, focusing on removing non-essential elements to highlight the fundamental components of a complex system. By emphasising simplicity and clarity, this movement creates a sense of visual calm that contrasts with the busy nature of daily life. From a psychological perspective, minimalism acts as a form of perceptual relief, offering a serene escape and a sense of harmony through simplicity and elegance. French writer Antoine de Saint-Exupéry encapsulated this idea of perfection, stating: "Perfection is achieved not when there is nothing more to add, but when there is nothing left to take away." This philosophy resonates with the minimalist approach, which seeks to reveal beauty and purpose through reduction.

Minimalism has no official definition, partly because there are no strict rules that clearly outline what is or isn’t minimalist design. This makes it difficult to define minimalism in architecture, as much of it depends on how each person interprets a space or the feelings it creates, making the concept somewhat subjective. However, certain features are generally associated with minimalist design, providing a basic



(Fig.100) :
A few iconic projects by architect Tadao Ando exemplify minimalist design by emphasising non-materiality, where the interplay of light and shadow reveals the essential qualities of materials rather than focusing on the materials themselves.

framework. These include simple imagery, clean geometric shapes, repeated elements, precision, and a focus on materials and simplicity. Minimalist design often showcases large, unbroken forms, balanced proportions, and exposed structural elements. It aims for pure expression without added decoration or references to the past, creating spaces that are clear, restrained, and focused on essentials.

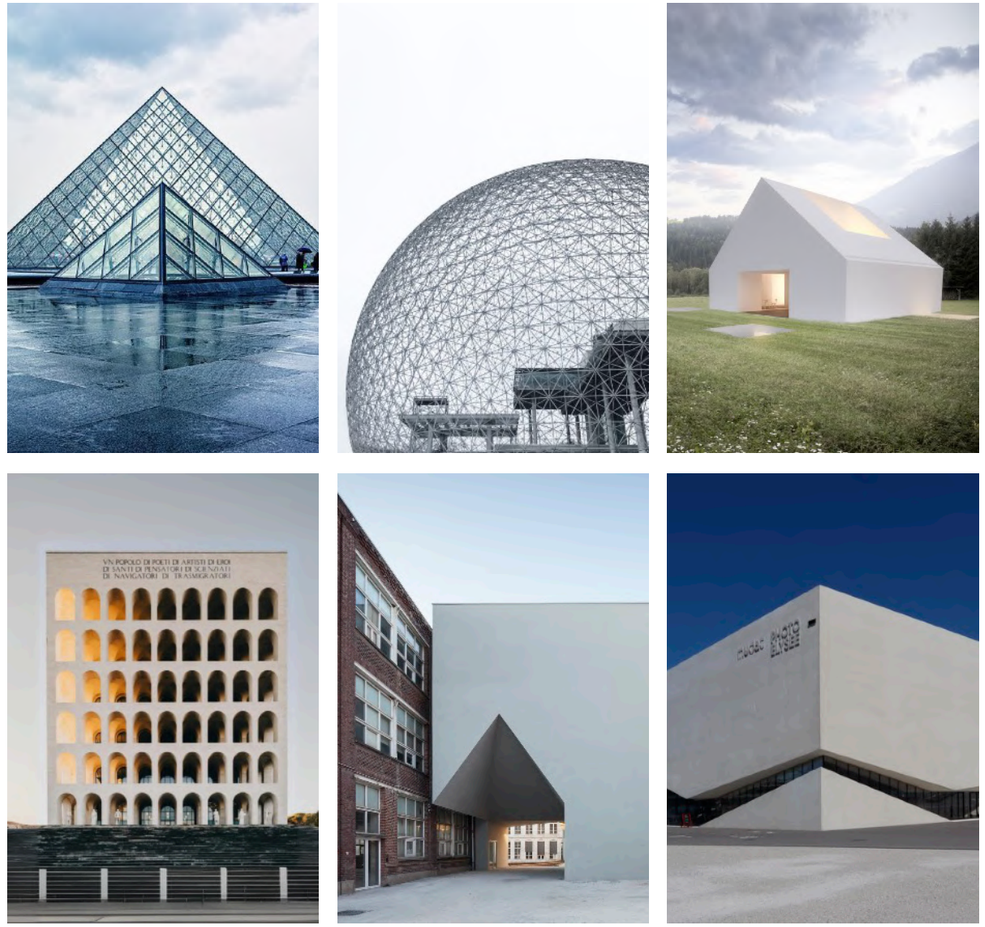
SHIFTING FROM MATERIALITY TO SPATIAL ESSENCE IN MINIMALIST ARCHITECTURE

New trends in architecture are shifting focus toward less material presence and more on the sensory and spiritual qualities of space. Today, elements like air, light, shadow, and smell are becoming materials of design. This raises the question: "Is materiality necessary in architecture?" Minimalism often embraces this concept of non-materiality by highlighting the essential qualities of materials through light, shadow, shape, and colour rather than the materials themselves. In minimalist architecture, materials are used not just to fill space but to define its essence and create a quiet, indirect language. This approach reflects a "voice of silence," where materials communicate subtly, encouraging an aesthetic experience that moves toward the "irreducible minimum," which minimalism seeks to achieve.

THE TRANSFORMATIVE ROLE OF LIGHT IN MINIMALIST ARCHITECTURE

Lighting plays a critical role in shaping minimalist aesthetics, emphasising the volume and mass of space to create complex and captivating effects. Through the use of light, materials can appear transformed, giving them a sense of “movement” that reveals their expressive character in interaction with shadows. In minimalist architecture, light is treated almost like a material itself—an essential medium that brings life to the structure, as it moulds and shapes the “soul” of the space. Contrast between light and shadow adds depth and transformation, enhancing spatial perception and becoming a key component of form.

The goal of minimalist design is to balance lightness and mass, as well as the inter-



(Fig.101) :
A few iconic projects by renowned architects serve as examples of minimalist design, showcasing the use of elementary geometric shapes and white as the primary colour to achieve clarity and simplicity in spatial composition.

play between gaps and fullness, to create harmony within a space. Often, cold white light is used for both decorative and diffuse artificial lighting, maintaining clarity and simplicity in the design. As architect Ian Moore notes, “The most important aspects of the place where we live are light, space, and ventilation,” highlighting light as a fundamental element that shapes how we experience minimalist architecture.

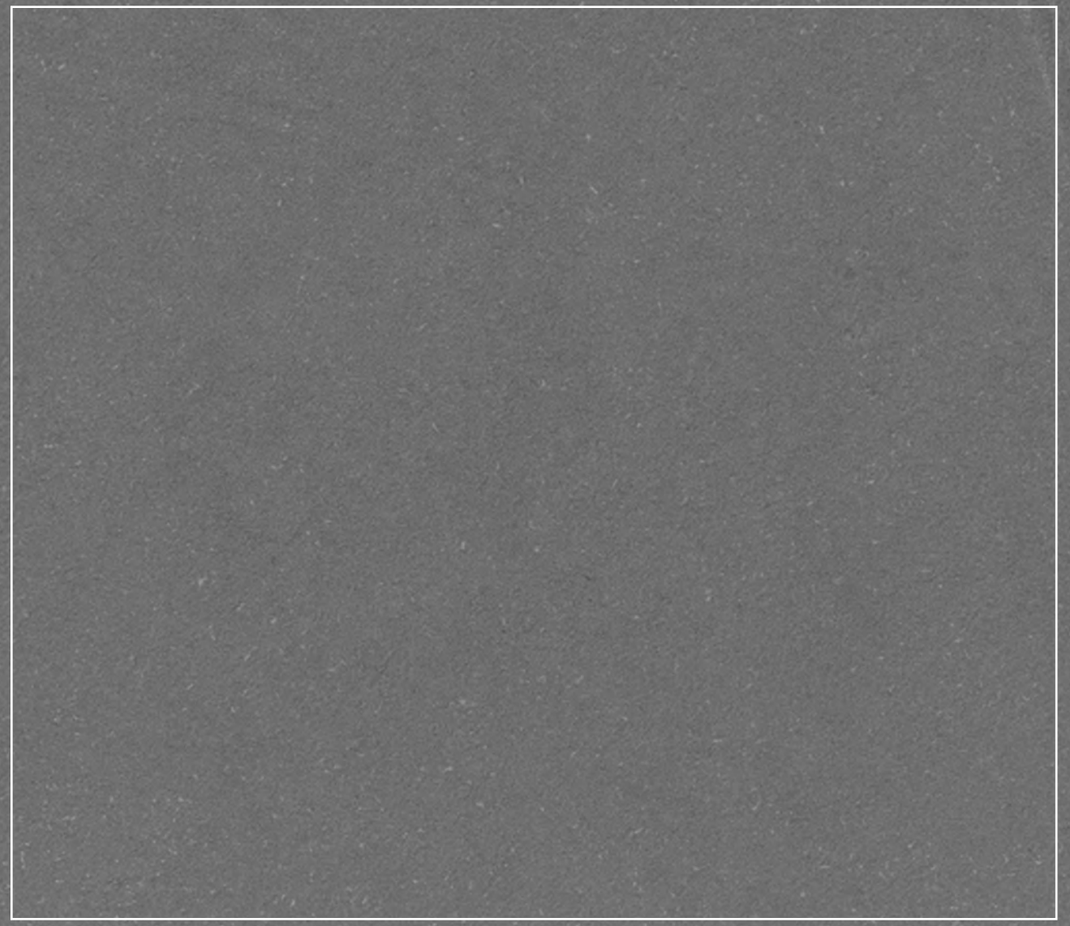
GEOMETRY AND COLOUR AS CORE PRINCIPLES IN MINIMALIST DESIGN

The use of elementary geometric shapes forms the foundation of minimalist composition, often relying on a single basic shape or a few similar orthogonal forms to create spatial clarity. Contemporary minimalist interiors embrace spatial simplicity, using white as the primary colour along with natural tones, soft textures, and occasionally high-tech elements. In some ways, this stripped-down architectural language reflects the digital age. Interior spaces often feature industrial or ultra-modern design elements, such as streamlined lighting, minimalist staircases, and sleek furnishings.

In minimalist design, form is prioritised over colour or texture, though colour still plays a powerful role in shaping a space’s character. Minimalist spaces typically avoid a wide colour range, favouring a limited palette often white (plaster), grey (raw concrete), and other clean, neutral surfaces. White, in particular, is central to minimalist interiors, as it enhances light, expresses form, and embodies a sense of universal spatial openness. It is also instrumental in resolving lighting challenges, as pure whiteness best reveals the essence of both form and material. As minimalist theory suggests, “The use of colour in architecture means addressing colour relation to architectural volumes and details,” allowing colour, when interacting with form, to become a subtle yet effective language of architecture.

DECODING ARCHITECTS

In this section, the architectural philosophy of Ludwig Mies van der Rohe is explored in relation to the principles of minimalism. By examining his design ideology and approach to space, this part focuses on how minimalism functions not just as a style but as a conceptual framework. The *Farnsworth House* serves as a key case study to understand his use of open planning, structural clarity, and reduction of form to essentials.



WHY MIES ?

4. DECODING ARCHITECTS AND PROJECTS

4.1 LUDWIG MIES VAN DER ROHE : FATHER OF MINIMALISM !

Ludwig Mies van der Rohe is one of the most significant pioneers of minimalism in architecture, and choosing him for my thesis is essential. His famous phrase, *"Less is more,"* is not just a slogan but a guiding principle that shaped the modern minimalist movement. His work emphasizes simplicity, clarity, and the honest use of materials, which aligns perfectly with the core principles of minimalism.

Mies approached architecture by stripping away unnecessary ornamentation and focusing on pure forms and essential elements. He believed that architecture should embody structural integrity and spatial freedom. By removing excess, he created buildings that were not only functional but also deeply aesthetic, showing how simplicity can elevate design. His use of materials like glass, steel, and concrete was groundbreaking, as he allowed their natural properties to shine, reflecting a truthfulness in construction and design.

One of the reasons Mies is essential to study is his mastery of open spaces and his ability to make minimal forms feel expansive and luxurious. In projects like the *Barcelona Pavilion* (1929), he demonstrated how simplicity could evoke a sense of elegance and harmony. The pavilion's clean lines, precise proportions, and open plan created a revolutionary design that remains iconic today. Similarly, in the *Farnsworth House* (1951), Mies used transparency and light to blend architecture with its natural surroundings, creating a seamless connection between the indoor and outdoor spaces.

Mies was also a visionary thinker, contributing significantly to the development of modernism through his leadership at the Bauhaus and later in the United States. He influenced generations of architects by showing that simplicity is not a lack of de-

(Fig.102) :
Portrait of architect *Ludwig Mies Van Der Rohe.*

The German architect Ludwig Mies van der Rohe was a pioneer of Modernist architecture and is often referred to as the father of minimalism. His timeless style, defined by simplicity and functionality, remains one of the most influential and sought-after design approaches even today.

sign but a deeper exploration of essential qualities. His work demonstrated that minimalism is not about doing less but about doing more with less—achieving a sense of balance, beauty, and functionality through restraint.

In the context of my thesis, studying Mies van der Rohe is crucial because his designs represent the foundation of minimalist architecture. He approached minimalism with a combination of philosophy, technical innovation, and aesthetic sensitivity, making his works timeless examples of how simplicity can enhance the essence of architecture. By decoding his principles, I can better understand the roots of minimalism and how his ideas continue to influence contemporary architects and designs.

4.1.2 INTRODUCTION

Ludwig Mies van der Rohe, born in 1886 in Aachen, Germany, is one of the most influential architects of the 20th century and a key figure in the history of minimalism in architecture. His journey began with an apprenticeship under Peter Behrens, a renowned German architect and designer. During this time, Mies was introduced to new ways of thinking about architecture, particularly the innovative use of materials like steel and glass. This experience shaped his philosophy and laid the foundation for his famous principle: *"Less is more."*

In 1930, Mies became the director of the Bauhaus, the iconic German art school that revolutionised modern design. The Bauhaus embraced architecture as a medium of art, promoting functional and simple designs that avoided unnecessary ornamentation. Mies adopted this philosophy wholeheartedly, favouring materials like steel, glass, and reinforced concrete to create buildings that were both structurally honest and visually clean. His work from this period set the stage for what we now recognise as modern minimalist architecture.

However, the rise of the Nazi regime in Germany led to the closure of the Bauhaus in 1933. In 1938, Mies moved to the United States, where he became one of the most innovative leaders of modern architecture. His designs in America, such as the Farnsworth House and the Seagram Building, showcased his ability to strip architecture down to its essence while still achieving a sense of elegance and sophistication.

Mies's work was not just about simplicity for its own sake—it was about revealing the true nature of materials and creating spaces that felt open and free. His approach to minimalism wasn't just a style but a philosophy of clarity and restraint, making him a vital figure to study for understanding how minimalism evolved in architecture.

4.1.3 ARCHITECTURAL PHILOSOPHY AND CONCEPTUAL INNOVATIONS

Ludwig Mies van der Rohe's design philosophy was rooted in the belief that architecture should serve the needs of people and that the design of a building should be informed by its function. He believed in creating designs that were simple, functional, and elegant, reflecting the era in which they were conceived. Mies did not aim to design buildings with a specific style; for him, philosophy always came first. The appearance of a building, he argued, was merely an expression of its time and the materials used. As he explained, *"I am not interested in the history of civilisation. I am interested in our civilisation."*

He strived towards an architecture with a minimal framework of structural order balanced against the implied freedom of free-flowing open space. He called his buildings *"skin and bones"* architecture. He sought a rational approach that would guide the creative process of architectural design, and is known for his use of the aphorisms *"less is more"* and *"God is in the details"*.

Mies was a great believer and developer of *"The Universal Space Theory."* The term *'universal space'* was first proposed by Mies van der Rohe to describe a kind of long-span single-volume flexible enclosure, which can be modelled or adapted to suit almost any user requirement.

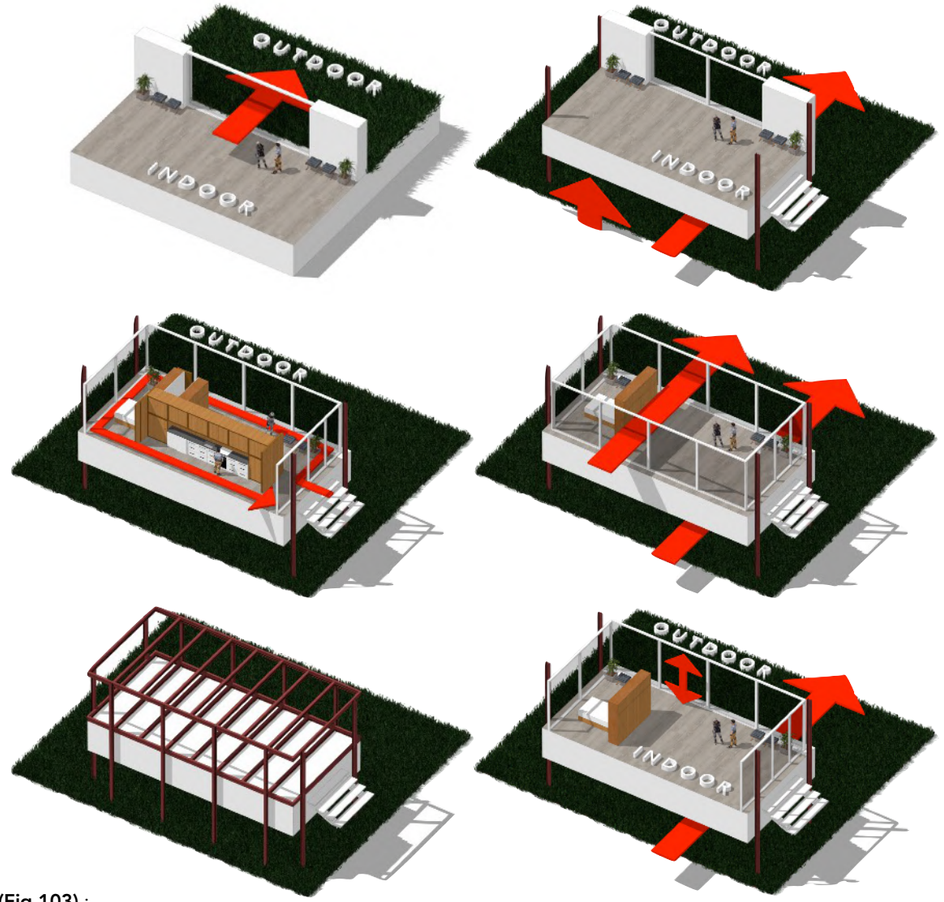
The term universal space originally referred solely to the usability of a space rather than its spatial quality. It describes buildings that enclose a large, single volume of space with long spans and minimal subdivisions. Mies used this concept to define spaces that are free-spanned and enclosed primarily by glass facades. Universal space, unrestricted by specific functions, represents an idealised abstraction of free and pure architectural space.

A central tenet of Mies' Universal Space Theory was adaptability and openness, achieved through modern materials like steel and glass. His designs, including the Farnsworth House, reflect an enduring emphasis on structural innovation and spatial fluidity. These principles ensure spaces can be reconfigured over time, meeting diverse functional requirements while maintaining a consistent aesthetic. By employing modular construction and open floor plans, Mies created structures that were as versatile as they were elegant. This adaptability not only extended the lifecycle of buildings but also minimised the environmental impact by reducing the need for constant reconstruction.

Mies' architectural philosophy and innovations revolutionised modern architecture, focusing on Transparency, Fluidity, and Open Spaces, which are also considered to be the major pillars of the Universal Space Theory.

FOCUS ON TRANSPARENCY AND FLUIDITY

Mies van der Rohe's focus on transparency highlights his innovative approach to blending indoor and outdoor spaces, making them feel like a unified whole. By using expansive glass panes, Mies allowed natural light to flood the interiors, creat-



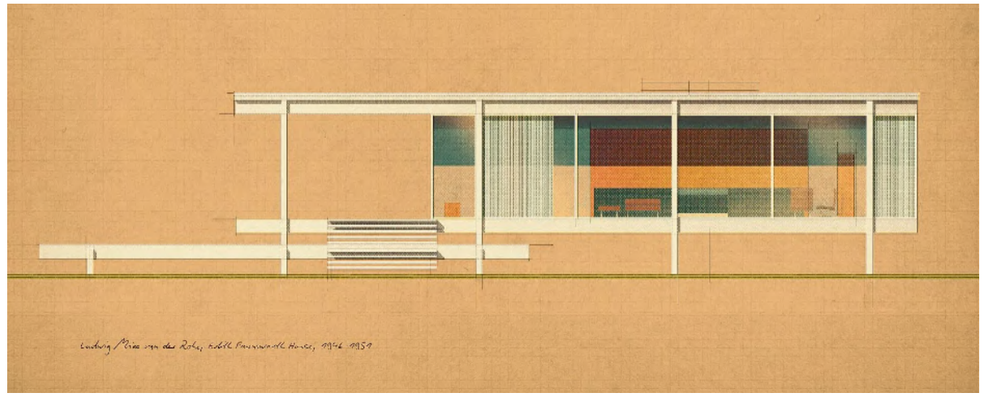
(Fig.103) :
Unfolding the concepts of Mies, integration of large glass panes to blur indoor-outdoor boundaries, cantilevered structures for uninterrupted spatial flow, and open floor plans with steel frameworks to achieve transparency, fluidity, and minimalist elegance.

ing an open and airy ambiance while reducing the reliance on artificial lighting. These glass surfaces also foster a strong visual connection between the interior and exterior, seamlessly integrating the building with its natural surroundings. This design philosophy emphasizes harmony with nature, striking a perfect balance between functionality and minimalist aesthetics.

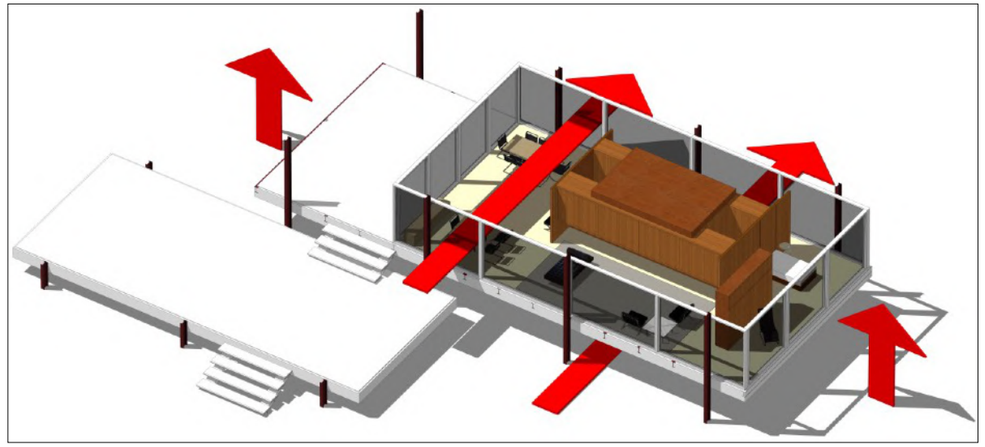
INTEGRATION WITH NATURE

The Farnsworth House is a prime example of Mies' transparency yet privacy driven design by integrating nature into the design. While floor-to-ceiling glass walls, floods the interiors with natural light, which dissolves the boundaries between the built structure and the surrounding landscape. Privacy is achieved through the use of placement of trees on the secluded site.

Mies elaborated on this concept in an interview about the Glass Pavilion, stating, *"Nature, too, shall live its own life. We must beware not to disrupt it with the colour of our houses and interior fittings. Yet we should attempt to bring nature, houses, and human beings together into a higher unity."* allowing nature to serve as both a shield and a companion to the design. Also this design allows residents to fully experience the changing seasons and immerse themselves in nature.



(Fig.104) :
THE FARNSWORTH HOUSE by German architect Ludwig Mies Van Der Rohe,
Plano, Illinois, United States.



(Fig.105) :
FILLER TEXT Unfolding the concepts of Mies, integration of large glass panes to blur indoor-outdoor boundaries, cantilevered structures for uninterrupted spatial flow, and open floor plans with steel frameworks to achieve transparency, fluidity, and minimalist elegance. ***FILLER TEXT***

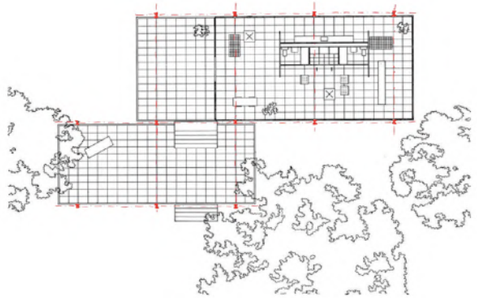
Mies' decision to elevate the structure on a cantilevered floor was a response to flood risks in that location. This practical solution not only ensured protection but also enhanced the spatial experience by allowing uninterrupted flow beneath the house, reinforcing the sense of transparency and fluidity. This elevated design complements the uninterrupted glass facades creating a floating effect that emphasizes the seamless integration of indoor and outdoor spaces while emphasising a sense of spatial continuity, making the relatively compact structure feel expansive and connected to its environment. This approach redefines the relationship between architecture and its context, showcasing Mies' mastery of blending form, function, and nature. The Farnsworth House exemplifies how transparency, as championed by Mies, can elevate architecture to a harmonious dialogue with its surroundings while adhering to the core principles of minimalism.

SIGNIFICANCE OF OPEN SPACES

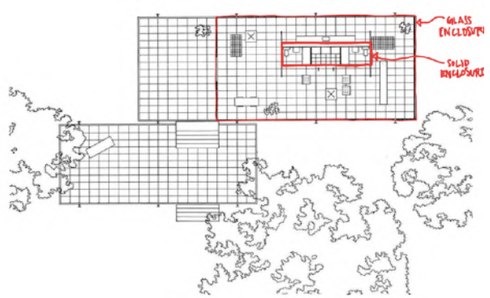
The concept of open spaces or open planning, a defining element of Ludwig Mies van der Rohe's architectural philosophy, underscores his belief in creating functional, adaptable environments that embrace simplicity. Open spaces, achieved through minimal use of walls and partitions, allow for flexibility and create a harmonious flow between interiors and exteriors. This principle is prominently showcased in Mies' Farnsworth House and Barcelona Pavilion, where the design blurs the line between indoor and outdoor environments, utilising glass facades and reflective materials to enhance spatial continuity and lightness.

Mies' designs frequently relied on grid systems and minimal structural elements, such as the slender steel columns in the Barcelona Pavilion, which provide support while maintaining openness. This approach aligns with his "less is more" philosophy, emphasising that every element in a space should serve a clear purpose. The floating rooflines and open floor plans create a sense of weightlessness and invite visitors to experience the interplay between architectural form, light, and the surrounding environment

4.1 FARNSWORTH HOUSE



(Fig.106) :
Unmolested regular grid & use of steel columns, giving a direction to underlying grid in the design of Farnsworth house by Ludwig Mies Van Der Rohe.



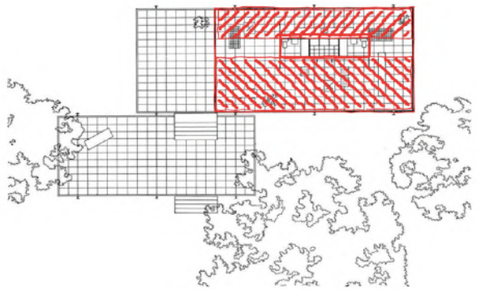
(Fig.107) :
The idea of "space within the space" that includes the house has an enclosed and an open zones in the design of Farnsworth house by Architect Mies.

The Farnsworth House by Mies exemplifies his mastery in using a regular grid system and I-section steel columns. The columns, establish a clear directionality within the design, reinforcing the underlying grid and contributing to the spatial rhythm of the house. This structural precision supports the elevated floor plan and open layout, allowing for flexibility in interior spaces. The strategic alignment of the steel columns plays a dual role: providing essential structural support and enhancing the visual flow of the design. By separating the columns from the partition walls, Mies achieved an unobstructed interior that emphasizes openness and freedom. This setup allows the architectural form to engage seamlessly with the surrounding environment.

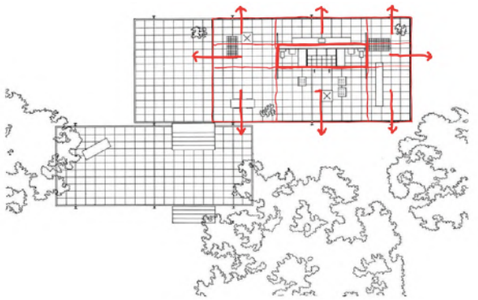
In the design Mies masterfully delineated space using two primary zones: a transparent glass enclosure and a solid core. The glass enclosure, composed of floor-to-ceiling windows, dissolves the boundary between interior and exterior, immersing occupants in the surrounding landscape and allowing natural light to permeate the

living area. This openness fosters a seamless connection with nature, aligning with Mies's philosophy of integrating architecture with its environment.

Contrasting this transparency, the solid core houses essential services, including the kitchen, bathroom, and a fireplace. This central volume provides necessary privacy and functional separation within the open plan, organising the interior space without the need for intrusive walls. The interplay between the transparent and solid elements creates a dynamic spatial experience, balancing openness with intimacy, where form and function coalesce to produce an elegant and harmonious living environment.



(Fig.108) :
Enclosed Zone or Solid Core separates the space into two parallel linear arrangements without any partition walls in the design of Farnsworth House.

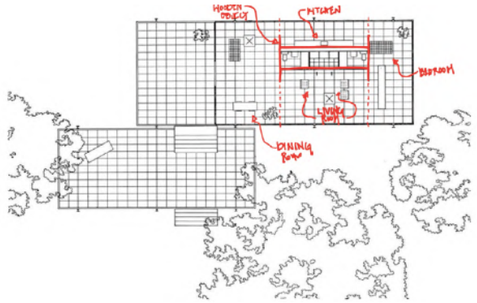


(Fig.109) :
Open Zone or Glass Enclosure said to be continuous in all four directions due to the use of full height glass panes in the design of Farnsworth House.

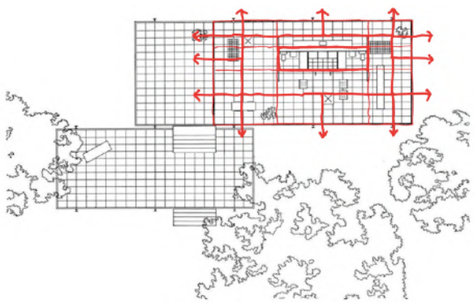
Mies ingeniously utilised a central solid core to organise the interior space into two parallel linear arrangements without the need for partition walls. This freestanding core, was places off centre, allowing for various sets of proportions to be used for each implied space while offering a separation between the sleeping area and public spaces of the house such as office, Living area and dining area, within the open plan, where as houses essential services such as the kitchen, bathroom, and fire-

place has been placed in the core by means of single wardrobe acting as partition itself.

By concentrating these functional elements within the core, Mies achieved a clear spatial organisation that delineates living areas while maintaining an unobstructed, flowing interior. The absence of interior walls allows for greater freedom in circulation and flexibility in the use of space, embodying Mies's minimalist design philosophy. This central core not only anchors the open plan but also enhances the spatial dynamics, creating a balanced interplay between functional and open zones.



(Fig.110) :
Despite the lack of any kind of partition walls it is still possible to point out the function of the room in the design of Farnsworth House.



(Fig.111) :
The entire interior space could be imagined continuous in all directions hear the walls looses its primacy and blends the space with surroundings.

Even though the house technically offers only one single room, the off-centred core, designed as a large wardrobe, subtly separates the space, creating more intimate and functional areas. A minimum number of elements is used to achieve maximum spatial articulation. The carefully placed furniture further defines these spaces, playing a key role in organising the interior. Despite the absence of walls, it is still possible to identify distinct spaces such as the kitchen, dining area, bedroom, living room, and office. Additionally, the arrangement of furniture and the four corners of the core create imaginary partitions between the spaces, enhancing the sense of openness while maintaining privacy within the house's minimalist design.

By not considering the partition walls in the design between the spaces, the entire interior space could be imagined continuous in any direction hear the walls looses its primacy. This thoughtful spatial organisation without any interruptions or partitions allows for a seamless interaction between the interior spaces and the surrounding environment, embodying Mies's philosophy of integrating architecture with nature.

CONCLUSION

This chapter has explored how minimalism, as practiced by Ludwig Mies van der Rohe, goes far beyond aesthetic simplicity to embrace philosophy, structure, and spatial freedom. At its core, minimalism values material integrity, clarity of structural expression, and reduction to essential form—principles that Mies articulated through aphorisms like *"less is more"* and *"God is in the details"*

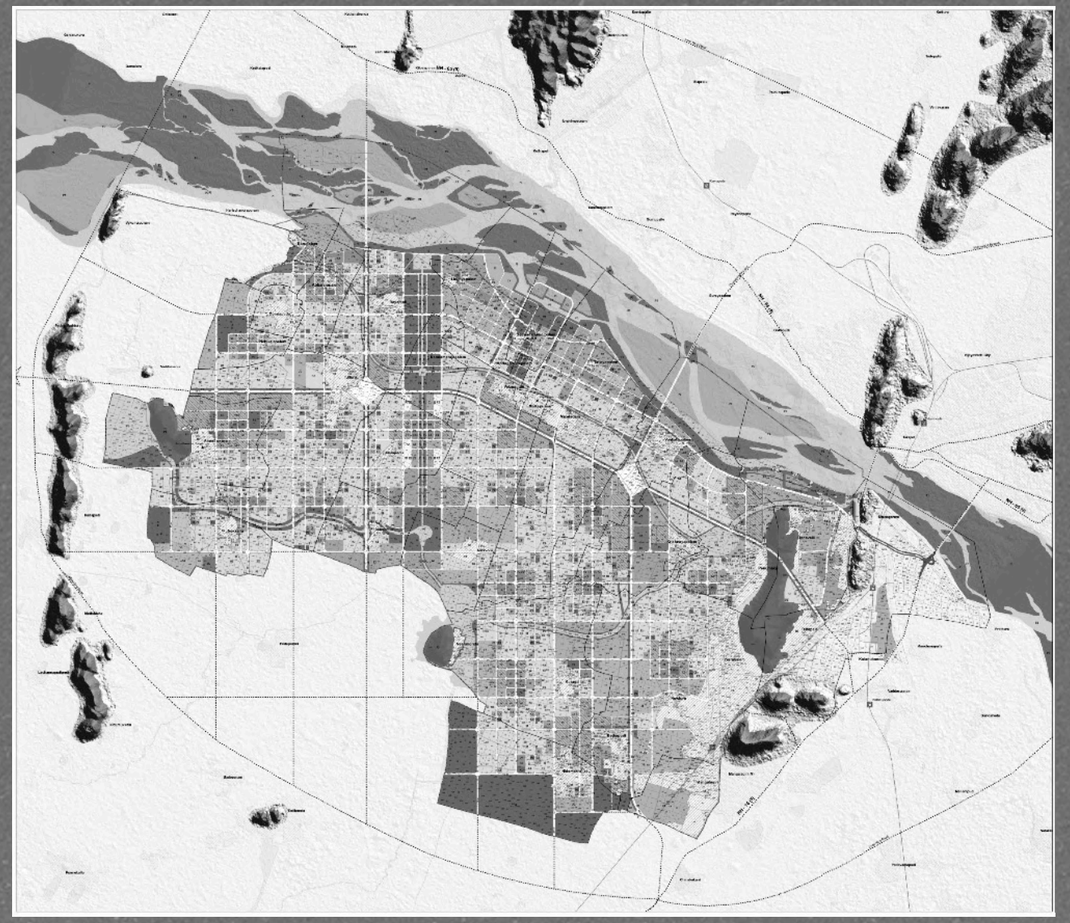
The **Farnsworth House** stands as a powerful embodiment of these ideas. Its open-plan layout, centrally located service core, and transparent glass envelope dissolve spatial boundaries. Only structural columns remain to articulate the plan, creating vast, uninterrupted interior space that flows seamlessly into the surrounding landscape. The design elevates the house above a flood plain and situates it within nature in a way that preserves harmony and lightness. Natural light floods the interior and encourages cross-ventilation, enhancing comfort and minimizing reliance on artificial systems.

Critically, the open-plan system functions as both spatial and experiential strategy. It promotes visual permeability, flexibility in use, and psychological continuity. The Farnsworth House's minimalist openness reduces cognitive clutter and fosters mental clarity—qualities echoed by architectural research linking minimalism with enhanced focus, productivity, and well-being.

Despite practical critiques regarding privacy, thermal comfort, and usability, the Farnsworth House remains an enduring prototype for minimalist living. It successfully demonstrates how open planning, transparency, and structural honesty can combine to create a profound connection between habitation and environment. In doing so, Mies not only shaped modern domestic architecture but also offered a lasting conceptual framework for minimalist design in urban and architectural practice.

WHY AMARAVATI ?

In this chapter, we explore the rich historical and urban evolution of Amaravati, a city that has transformed from an ancient Buddhist settlement into one of India's most ambitious planned capitals. Located on the southern banks of the Krishna River in Andhra Pradesh, Amaravati is being developed as a greenfield capital city in response to the state's bifurcation in 2014. Envisioned as a symbol of modern governance and sustainable urbanism, the city spans over 217 square kilometres and is strategically positioned between Vijayawada and Guntur. With its master plan incorporating smart infrastructure, green corridors, and integrated transport systems, Amaravati reflects a bold vision for future-ready urban development in India.



5.1 AMARAVATI (NEW CAPITAL CITY)

5.1.1 INTRODUCTION

Amaravati, envisioned as the new capital city of Andhra Pradesh, stands as one of India's most ambitious urban development projects of the 21st century. Located along the southern banks of the Krishna River, the city spans approximately **217.23 square kilometers**, designed to meet the administrative, economic, and cultural needs of the state following its **bifurcation in 2014**. Strategically situated between **Vijayawada and Guntur**, two major urban hubs, Amaravati benefits from regional connectivity and is integrated into a broader **economic and cultural corridor**.

Planned as a **greenfield city**, Amaravati was conceived with the vision of becoming a **world-class, sustainable, and technologically advanced urban center**. Drawing inspiration from global capital cities, its master plan emphasizes **smart infrastructure**, **green corridors**, **public transport systems**, and **mixed-use urban zones** that promote efficient land use and liveability. The city's layout aims to balance innovation with inclusivity, sustainability with growth.

Despite facing political and economic shifts over the years, **Amaravati continues to symbolize planned urbanism in contemporary India**, blending **cultural heritage**, **governance**, and **future-ready urban planning** to lay the foundation for a vibrant, resilient capital city. **The city's first phase is set to be completed within 30 months, aiming to position Amaravati among the world's top five capital cities. Planned for a population of 3.5 million by 2050, and over 1,600 km of cycle tracks. This bold vision emphasizes sustainability, connectivity, and economic growth.** Amaravati stands as a testament to India's evolving approach to planned urbanism.

(Fig.112) The satellite image shows Amaravati situated along the banks of the Krishna River, highlighting its strategic location with expansive agricultural land, water resources, and connectivity that shape its urban development potential.

5.1.2 GEOGRAPHICAL FEATURES & CLIMATE OF AMARAVATI

Geographical Features

Amaravati, the capital city of Andhra Pradesh, is located in the **Guntur district**, nestled along the **southern banks of the Krishna River**, approximately **15 kilometers west of Vijayawada**, **16 kilometers north of Guntur**, and **45 kilometers southeast of Tenali**. Geographically, it lies at **16.5097° N latitude and 80.5185° E longitude**, with an average elevation of **27 meters (89 feet)** above sea level. The city spans **217.23 square kilometers**, encompassing **25 villages across three mandals—Thullur, Mangalagiri, and Tadepalli**—and is home to around **100,000 people living in approximately 27,000 households**.

Amaravati's terrain is largely **flat and fertile**, forming part of the **Krishna River basin**, a region known for its agricultural richness, especially in **rice cultivation**. It is also strategically placed at the center of the **Andhra Pradesh Capital Region**, which includes parts of **Guntur, Palnadu, Krishna, and NTR districts**, connecting major urban centers like **Vijayawada, Guntur, and Tenali**, along with several towns and villages.

Climatic Conditions

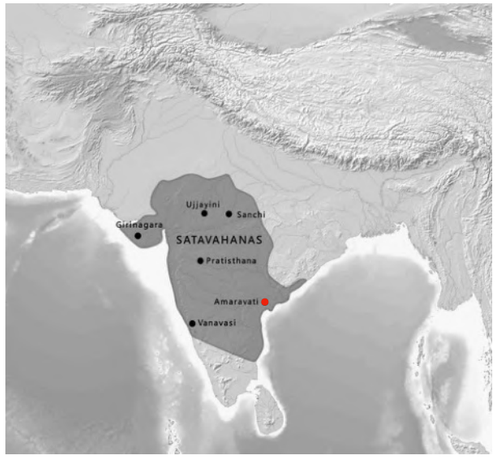
The **climate** is tropical and marked by **hot and humid summers**, where temperatures range from **17°C to 45°C**, with **humidity** levels rising up to **68%**, while **winters** are relatively mild, ranging from **12°C to 30°C**.

5.2 TECHNICAL REPORT

To understand **why Andhra Pradesh needed a new capital**, it is essential to trace the region's historical, political, and administrative evolution. The story spans centuries from **ancient dynastic rule to colonial influence, post-independence reorganization, and the recent bifurcation of the state**. This chapter is structured into **four key periods: the Satavahana Dynasty, the era before independence, the post-independence phase, and the current state after the bifurcation in 2014.** Each of these milestones reveals the shifting power centers and regional dynamics that ultimately necessitated the creation of a new capital city - Amaravati.

5.2.1 SATAVAHANA DYNASTY

The Beginning



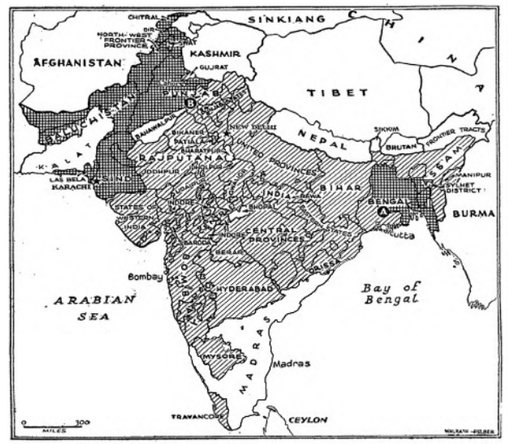
(Fig.113) The 18th-century map highlights the Satavahana dynasty and its capital cities, with Amaravati marked as a key historic and cultural center.

Amaravati, the capital city of the Indian state of Andhra Pradesh, is named after the nearby historic site of **Amaravathi**, which served as one of the capitals of the **Satavahana Dynasty** (Figure 113) around two millennia ago. The name *Amaravati* literally translates to *"the abode of immortals"*, and holds significance from historical, spiritual, and mythological perspectives. This name was also used in the 18th century for a village near **Dharanikota**, the ancient capital of the Satavahanas. The Satavahanas hold a prominent place in the history of Andhra Pradesh, with **Buddhism flourishing during their reign**, contributing significantly to the faith's spread in the region. The primary language was Prakrit written using the Brahmi script, which served as the base for of Telugu script.

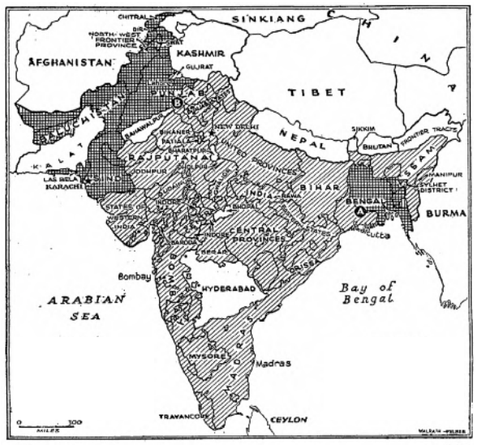
Over the centuries, this area was ruled successively by various dynasties and empires, including the **Ikshvakus, Vishnukundinas, Pallavas, Cholas, Kakatiyas, the Delhi Sultanate, Musunuri Nayaks, Bahmani Sultanate, Vijayanagara Empire, the Sultanate of Golconda**, and the **Mughal Empire**, as Amaravati being one of the capitals before eventually becoming part of the **Nizamate of Hyderabad** in 1724.

5.2.2 BEFORE INDEPENDENCE

During British East India Company



(Fig.114) The 20th-century map highlights the Andhra were part of Madras Presidency.



(Fig.115) The 20th-century map highlights the Hyderabad were ruled by Nizam.

During the pre-independence period, the **Telugu-speaking region** was divided between two major administrative entities. The **Telangana region** was part of the **Hyderabad State** (FigureX), ruled by the **Nizam**, while **Andhra** were part of the **Madras Presidency** under the rule of **British East India Company** (FigureX). Nizam Kings being Muslims were always against the interests of Hindus. They used to collect heavy taxes, thus pushing Telangana people into extreme poverty. In contrast, the regions under British rule, though subjected to colonial exploitation, the people were reasonably educated, where few of them turned into businessmen. Following **Operation Polo,** a military action by the Indian government, **Hyderabad State was integrated into the Indian Union**, leading the way for the unification of Telugu-speaking regions.(Figure X)

5.2.3 AFTER INDEPENDENCE

After British East India Company

During the post-independence period, in 1953, a decision was taken by leaders of Andhra to have **a separate state for Telugu speaking region** leading to the **formation of the Andhra State** through the **bifurcation of the Madras Presidency**. As a result, **Andhra lost Chennai (formerly Madras) to the newly formed state Tamilnadu** and This left Andhra without a well-established city to serve as its capital.

(Fig.116) State map of newly formed Andhra Pradesh merging both Telugu speaking states Telangana and Andhra post Independence.

The need to develop a new capital from scratch was a significant challenge for the newly formed state. Since both **Andhra and Telangana were Telugu-speaking regions**, and **Hyderabad held the necessary infrastructure and potential to serve as a capital**, strong and rich class politicians of Andhra approached then Prime Minister Jawaharlal Nehru to propose a merger. **Despite resistance from sections of Telangana, the merger was approved in 1956** to maintain political stability, **forming the unified state of Andhra Pradesh, with Hyderabad as its capital** (Figure X).

Telangana people were against the merger but **The Gentlemen's Agreement was signed in 1956 between Andhra and Telangana leaders to safeguard the interests of Telangana**. Later due to political disparities and perceived injustices in overall development ultimately led to the formation of a separate Telangana state.

5.2.4 AFTER BIFURCATION IN 2014

The New Beginning

Following the bifurcation of Andhra Pradesh in 2014 (Figure X), it faced the significant challenge of establishing a new capital. **The Andhra Pradesh Reorganisation Act, 2014, designated Hyderabad as the joint capital for both states for a period of ten years. However, as of June 2, 2024, Hyderabad ceased to serve as the capital for Andhra Pradesh, becoming the sole capital of Telangana.**

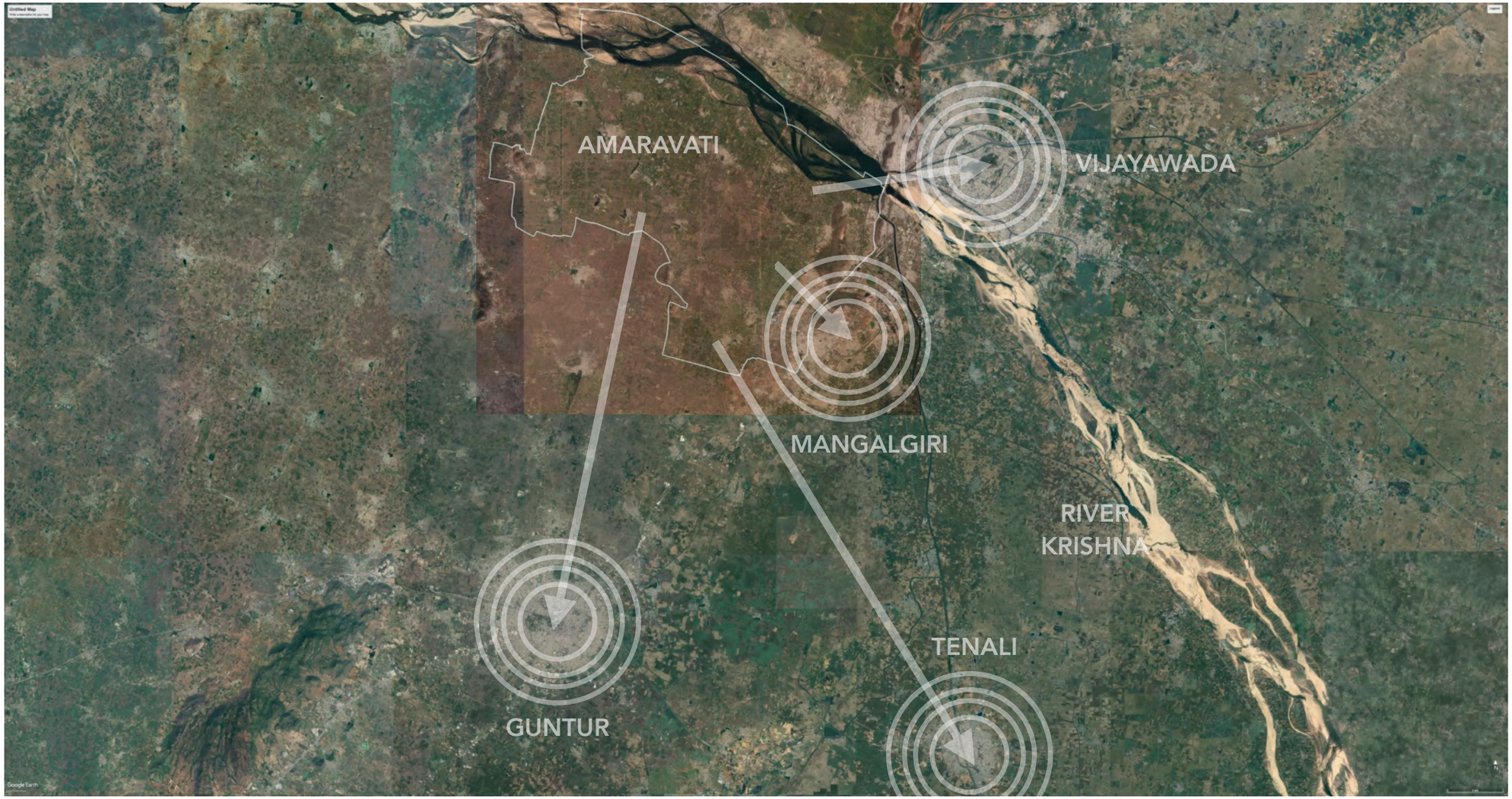
In response to this, the Andhra Pradesh government, **proposed the development of a new capital city i.e Amaravati.**

(Fig.117) State maps of Andhra Pradesh and Telangana after Bifurcation in 2014

Reasons to choose Amaravati as new capital city.

Due to its **strategic location between the major cities of Vijayawada and Guntur**, due to its **deep historical roots as the ancient capital of the Satavahana dynasty.** The location offered an excellent opportunity to develop **a world-class riverfront capital city,** leveraging the ample water resources from the Krishna River to support a futuristic Mega Metropolitan State Capital Region and **its potential for well-planned, modern urban development.** Geographically, Amaravati is almost **centrally located between the regions of Uttarandhra and Rayalaseema**, making it **equidistant and easily accessible from all parts of the state.**

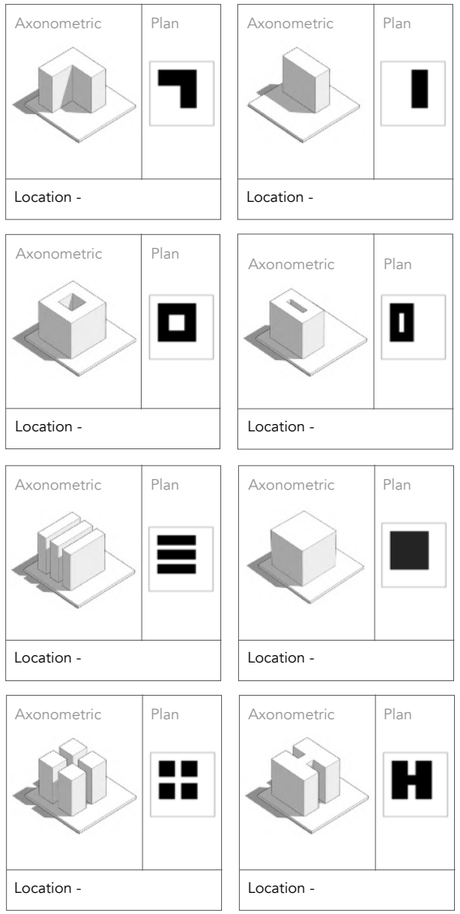
5.3
SITE CONTEXT



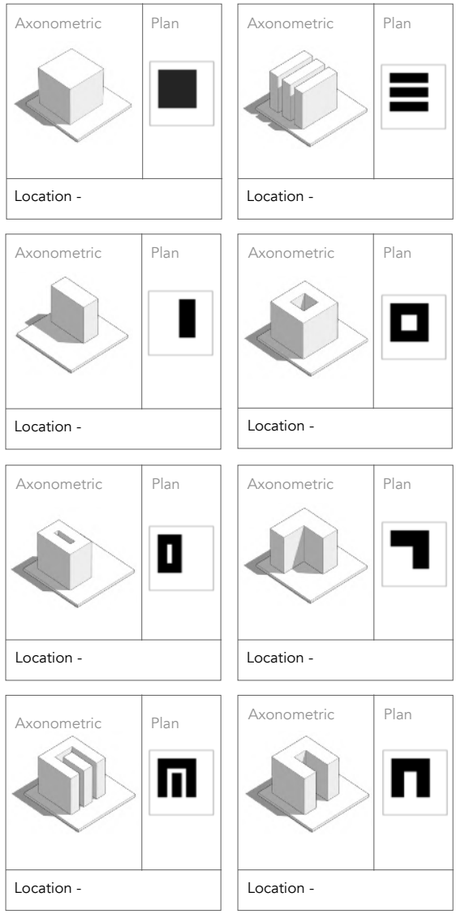
(Fig.118) Satellite image of new capital city of Andhra Pradesh, Amaravati living in the banks of river Krishna highlights its surrounding cities Guntur, Mangalgiri, Vijayawada and Tenali as its surrounding context.

5.4 IDENTIFICATION OF BUILDING TYPOLOGIES

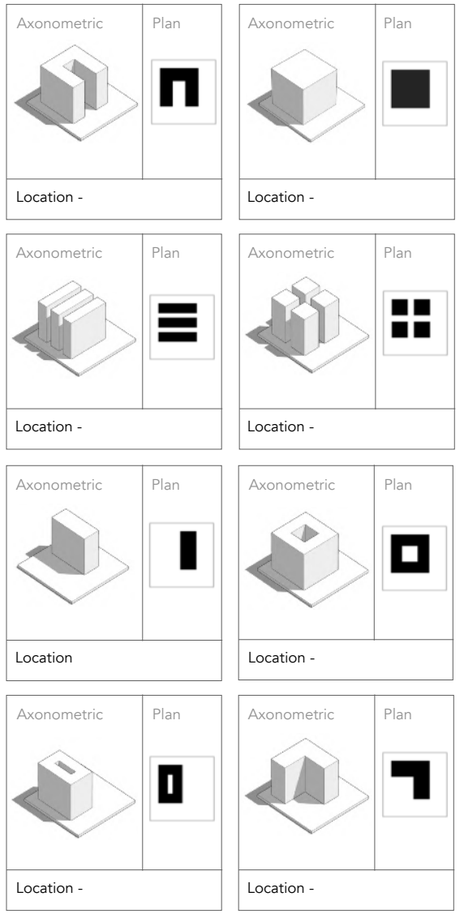
VIJAYAWADA



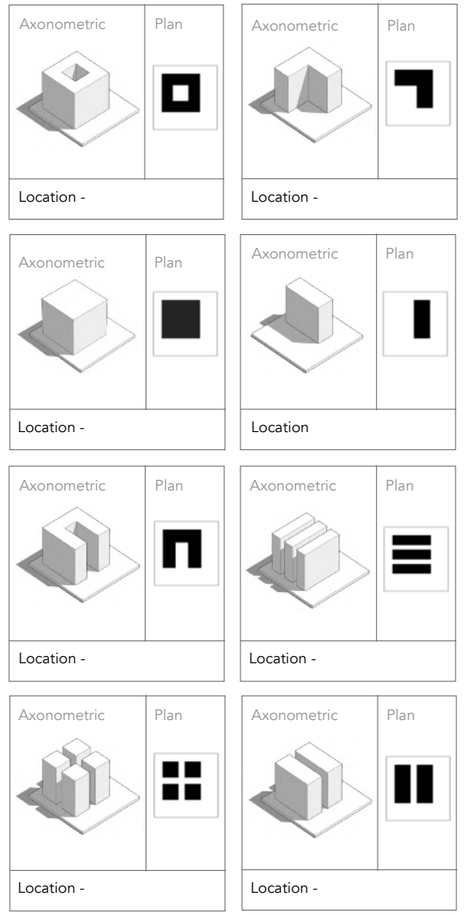
GUNTUR



MANGALGIRI

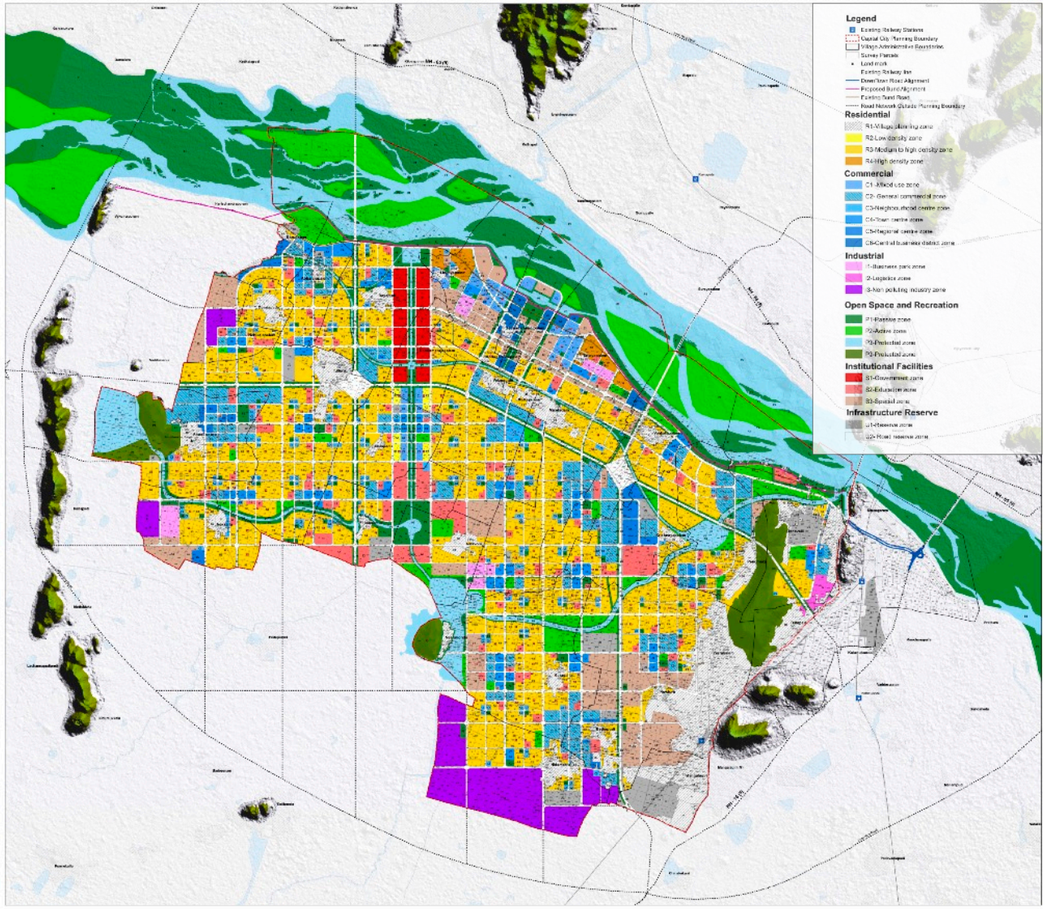


TENALI



5.5 AMARAVATI

In this chapter, I will present the proposed master plan for the new capital city of Andhra Pradesh—Amaravati—as envisioned by the Andhra Pradesh Capital Region Development Authority (APCRDA). This comprehensive plan aims to transform Amaravati into a globally competitive and sustainable city, integrating economic growth, infrastructure development, and environmental sustainability . Additionally, I will provide an overview of the current state of Amaravati to contextualize its existing urban conditions.



(Fig.119) The master plan of Amaravati, prepared by APCRDA (Andhra Pradesh Capital Region Development Authority), outlines the city's proposed urban structure, featuring its zoning, road networks, green corridors, and integration with the Krishna Riverfront, reflecting the vision for a modern, planned capital city.

(Fig.120) The satellite image shows Amaravati situated along the banks of the Krishna River, highlighting its strategic location with expansive agricultural land, water resources, and connectivity that shape its urban development potential.

5.6 CONCLUSION

In this chapter, we will explore the rationale behind selecting Amaravati as the site for our design proposal. By examining the urban development trajectories of Barcelona and Chandigarh—two iconic cities that were master-planned and developed from the ground up—we identify several meaningful parallels that underscore Amaravati's potential as a modern, well-planned capital city. These comparisons help us understand how Amaravati stands at a similar point of opportunity, where visionary urban design can shape its future.

This chapter aims not only to highlight the commonalities between these cities but also to justify the selection of Amaravati as the site for the design intervention. By drawing from the successes and planning ideologies of Barcelona and Chandigarh, the intention is to create a strong conceptual foundation for the proposal. Furthermore, this comparison supports the belief that Amaravati, being a capital city in its formative phase, offers the rare advantage of a blank slate—free from past urban limitations and full of possibilities for sustainable growth, inclusive planning, and cultural identity.

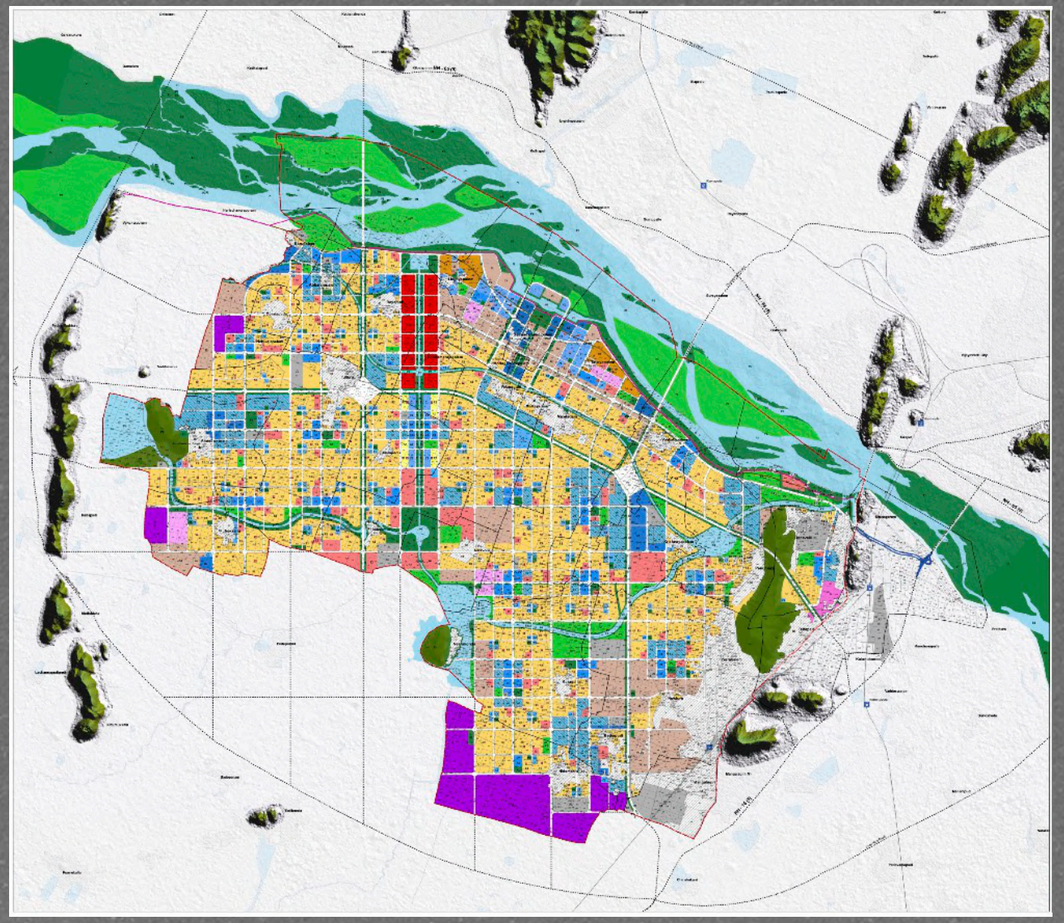
Reasons to choose Amaravati as site for Project proposal.

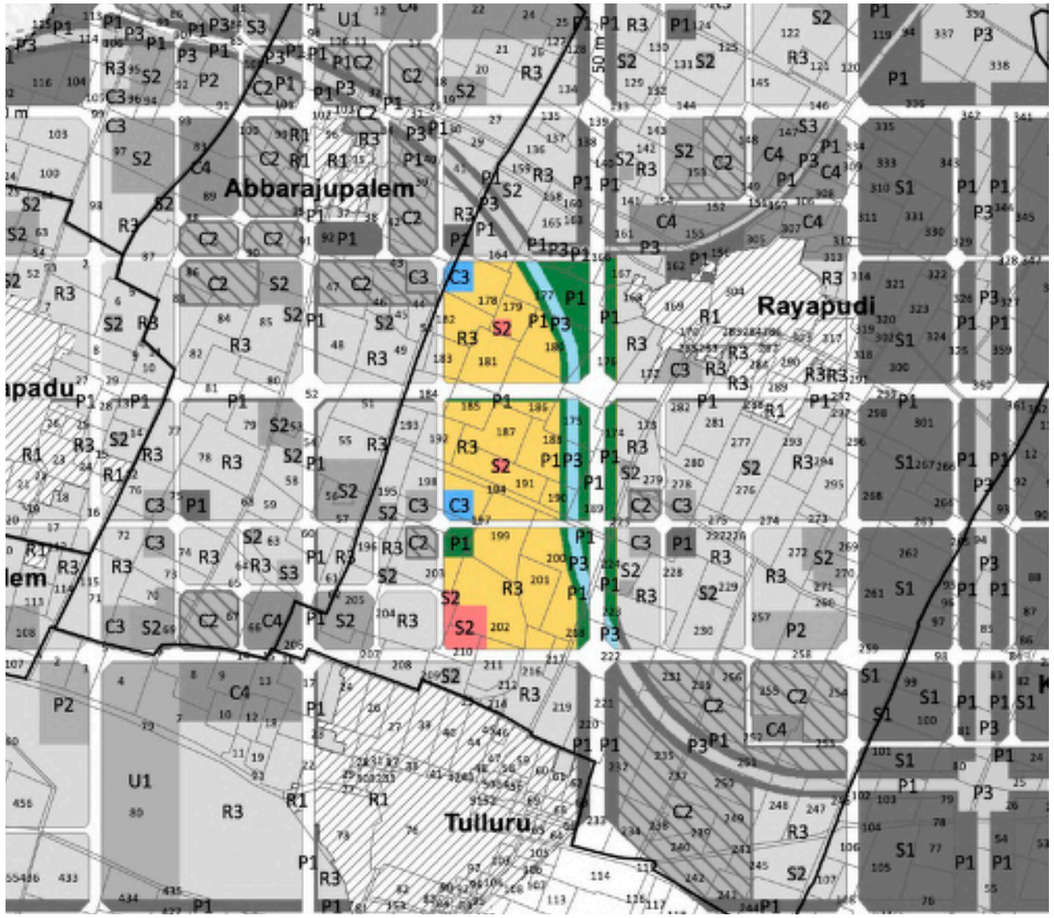
Amaravati's development shares notable similarities with the planning and growth of Barcelona and Chandigarh

- **Planned Development from Scratch**: All three cities—Barcelona, Chandigarh, and Amaravati—were designed with comprehensive master plans, allowing for systematic infrastructure and urban development without the constraints of pre-existing structures.
- **Integration of Surrounding Villages**: Similar to Barcelona's expansion through the incorporation of adjacent villages, Amaravati's development involved merging 25 villages from the Thullur, Mangalagiri, and Tadepalli mandals, integrating them into the capital city area.
- **Grid-Based Urban Planning**: Chandigarh is renowned for its grid-based layout with sector dimensions of approximately 800m x 1200m. Amaravati's proposed plan features a grid pattern with blocks measuring around 800m x 800m, reflecting a similar approach to organized urban planning.
- **Strategic Geographical Positioning**: Both Chandigarh and Amaravati were strategically located to serve as central hubs within their respective regions, facilitating balanced regional development and accessibility.
- **Emphasis on Green Spaces and Sustainability**: Amaravati's master plan includes 51% green spaces and 10% water bodies, drawing inspiration from Chandigarh's design, which integrates extensive parks and green belts to promote environmental sustainability.
- **Government-Led Development Initiatives**: The establishment of development authorities, such as the Andhra Pradesh Capital Region Development Authority (APCRDA) for Amaravati, mirrors the creation of similar bodies for Barcelona and Chandigarh, ensuring focused governance and execution of urban planning objectives.

6.1 SITE SELECTION

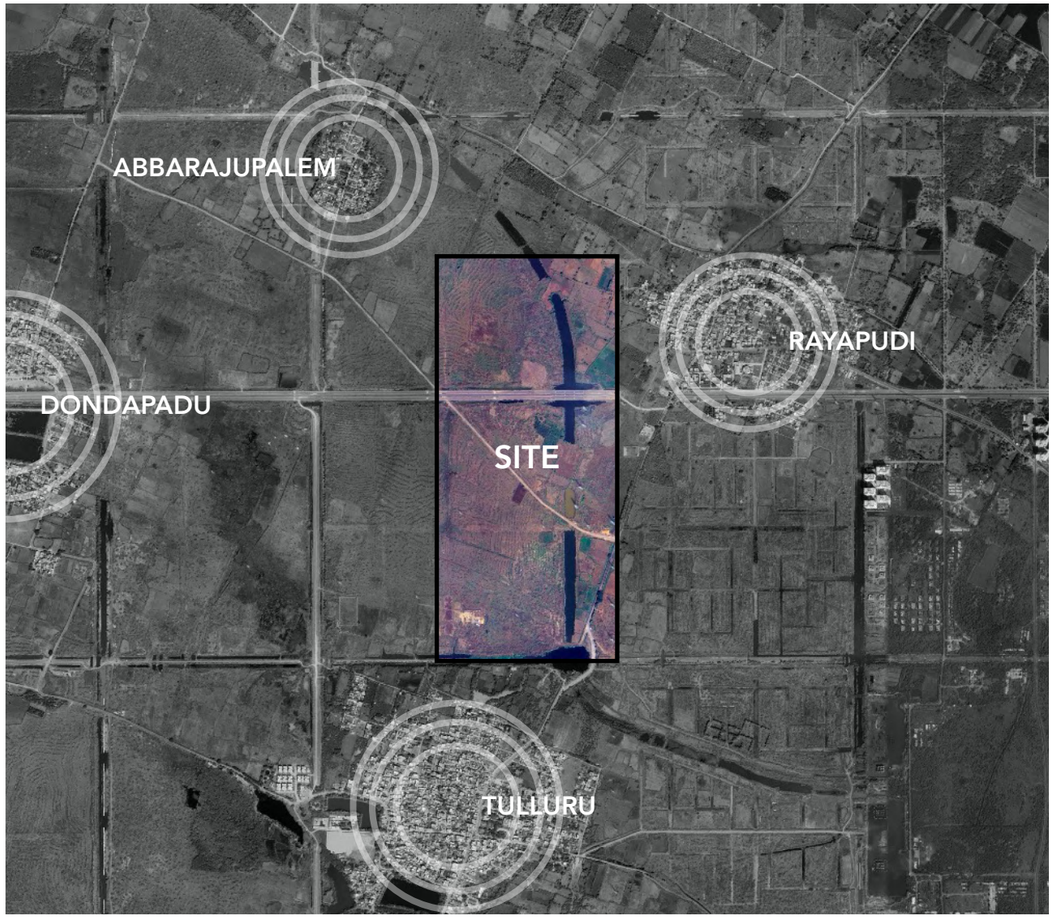
The selected site for the design proposal is strategically located near the center of the Amaravati Capital Region and is surrounded by four existing villages. This positioning not only offers a central advantage but also provides an excellent opportunity for integrated urban expansion. The proximity to these villages allows for seamless incorporation of local communities into the city's future development, promoting both cultural continuity and social inclusivity. Additionally, the site's location makes it highly accessible and well-connected, which enhances its potential for rapid infrastructural and economic growth. Its nearness to established settlements means basic utilities and services can be extended efficiently, making it an ideal zone for catalytic development within the emerging capital city.





(Fig.121) The master plan of Amaravati, prepared by APCRDA (Andhra Pradesh Capital Region Development Authority), highlighted is the potential proposal for Design development, located in between four nearby villages which has a potential for a river front development.

(Fig.122) The master plan of Amaravati, prepared by APCRDA (Andhra Pradesh Capital Region Development Authority), highlighted is the potential proposal for Design development, located in between four nearby villages which has a potential for a river front development.



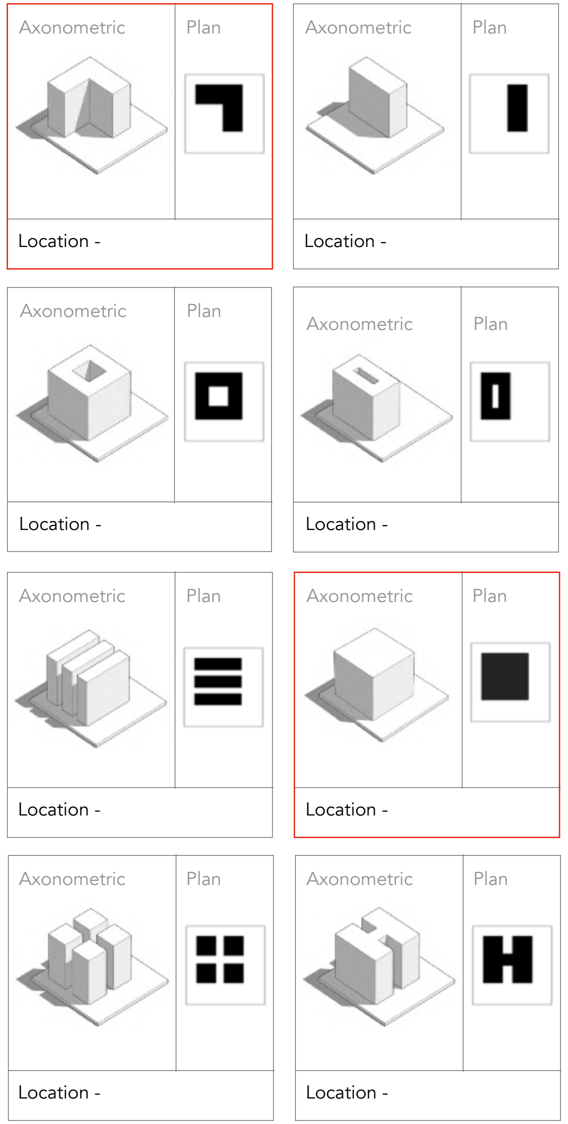
(Fig.123) The Satellite image in which the highlighted is the potential proposal for Design development, located in between four nearby villages which has a potential for a river front development.

(Fig.124) The Satellite image in which the highlighted is the potential proposal for Design development, located in between four nearby villages which has a potential for a river front development.

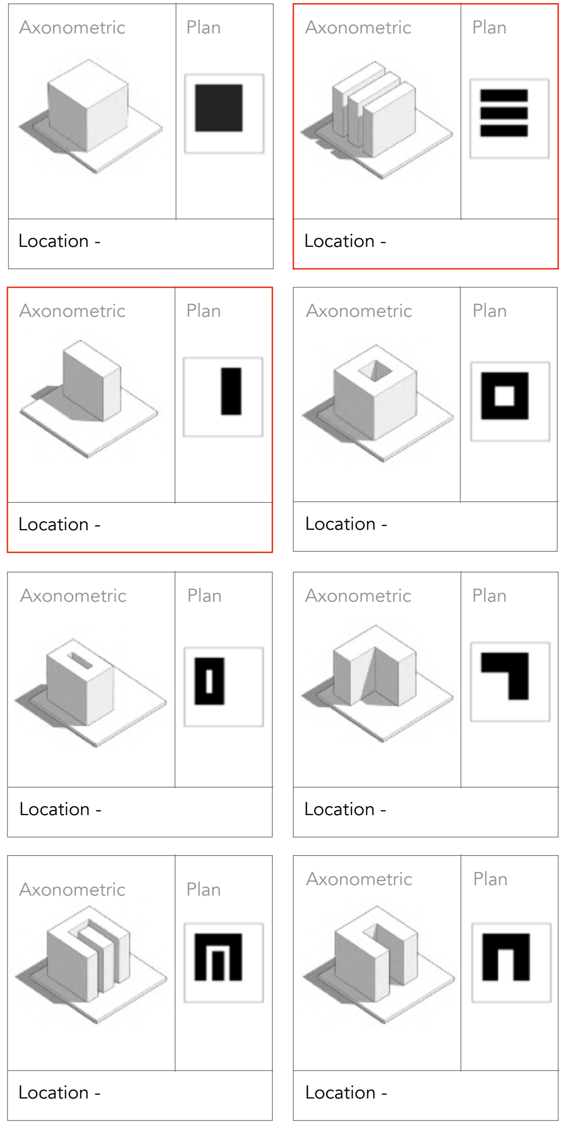
6.2 CITY COLLECTION

(FILLER TEXT) In this chapter, we explore the rich historical and urban evolution of Amaravati, a city that has transformed from an ancient Buddhist settlement into one of India's most ambitious planned capitals. Located on the southern banks of the Krishna River in Andhra Pradesh, Amaravati is being developed as a greenfield capital city in response to the state's bifurcation in 2014. Envisioned as a symbol of modern governance and sustainable urbanism, the city spans over 217 square kilometres and is strategically positioned between Vijayawada and Guntur. With its master plan incorporating smart infrastructure, green corridors, and integrated transport systems, Amaravati reflects a bold vision for future-ready urban development in India.

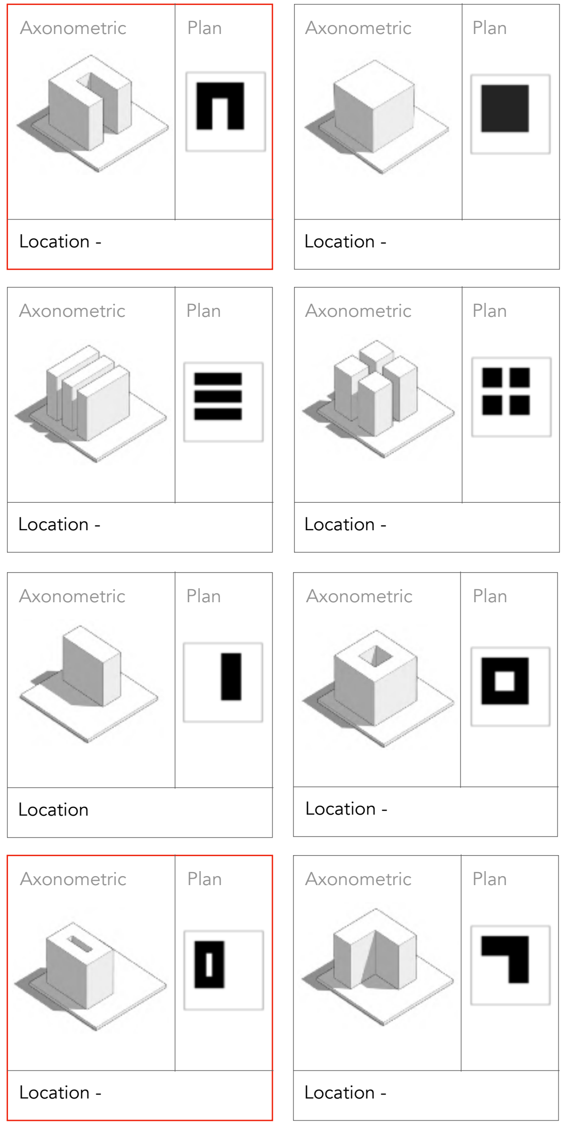
VIJAYAWADA



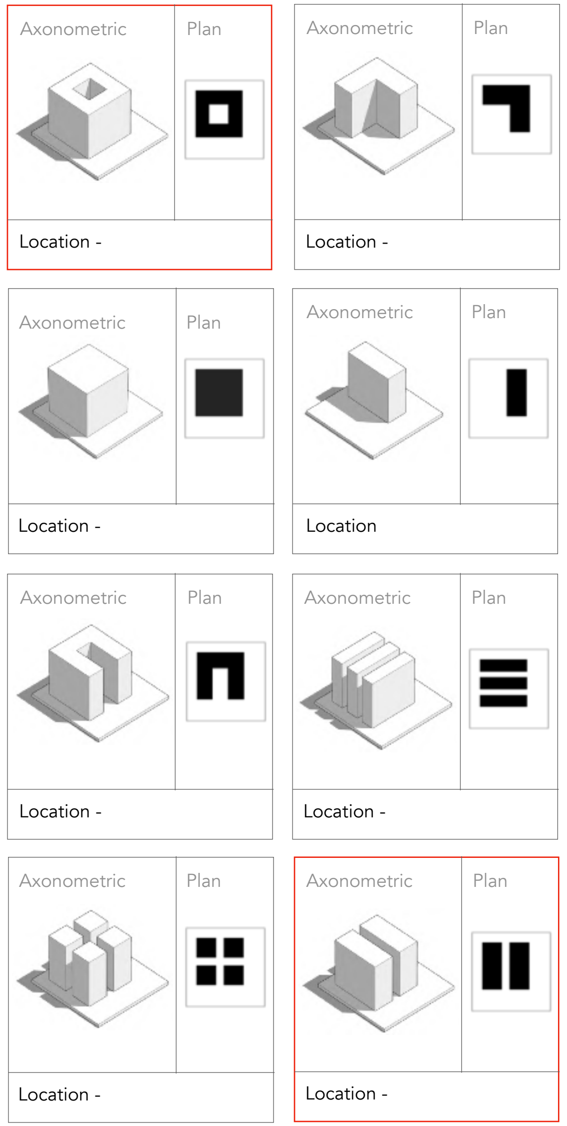
GUNTUR

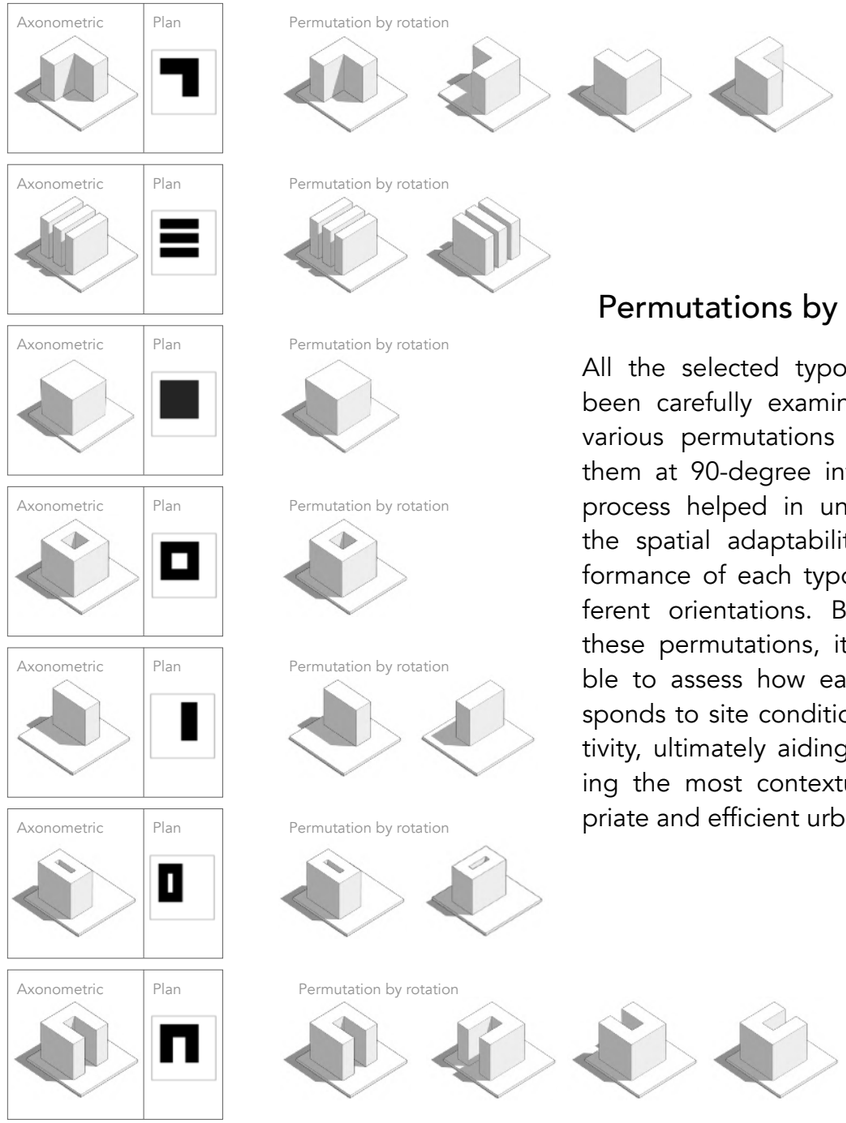


MANGALGIRI



TENALI



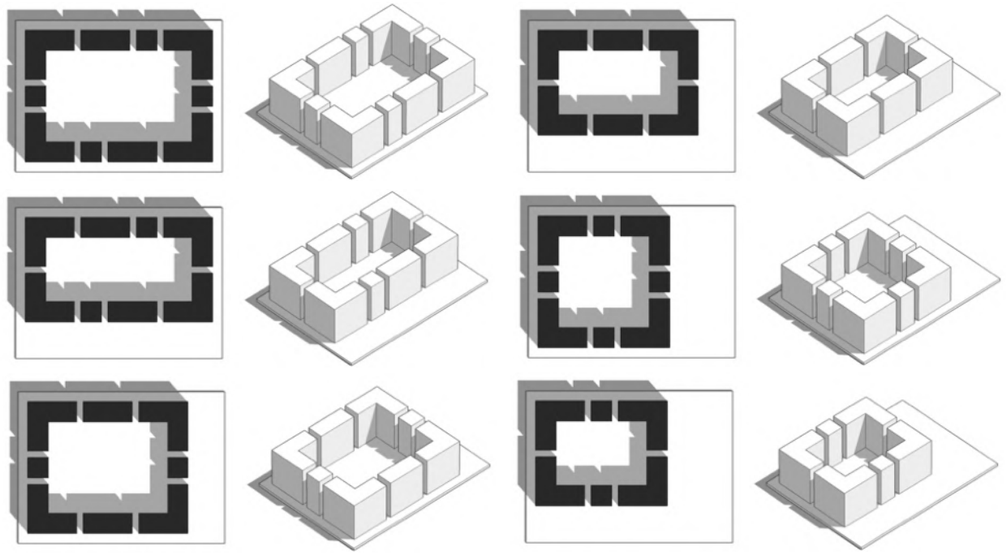


Permutations by Rotation

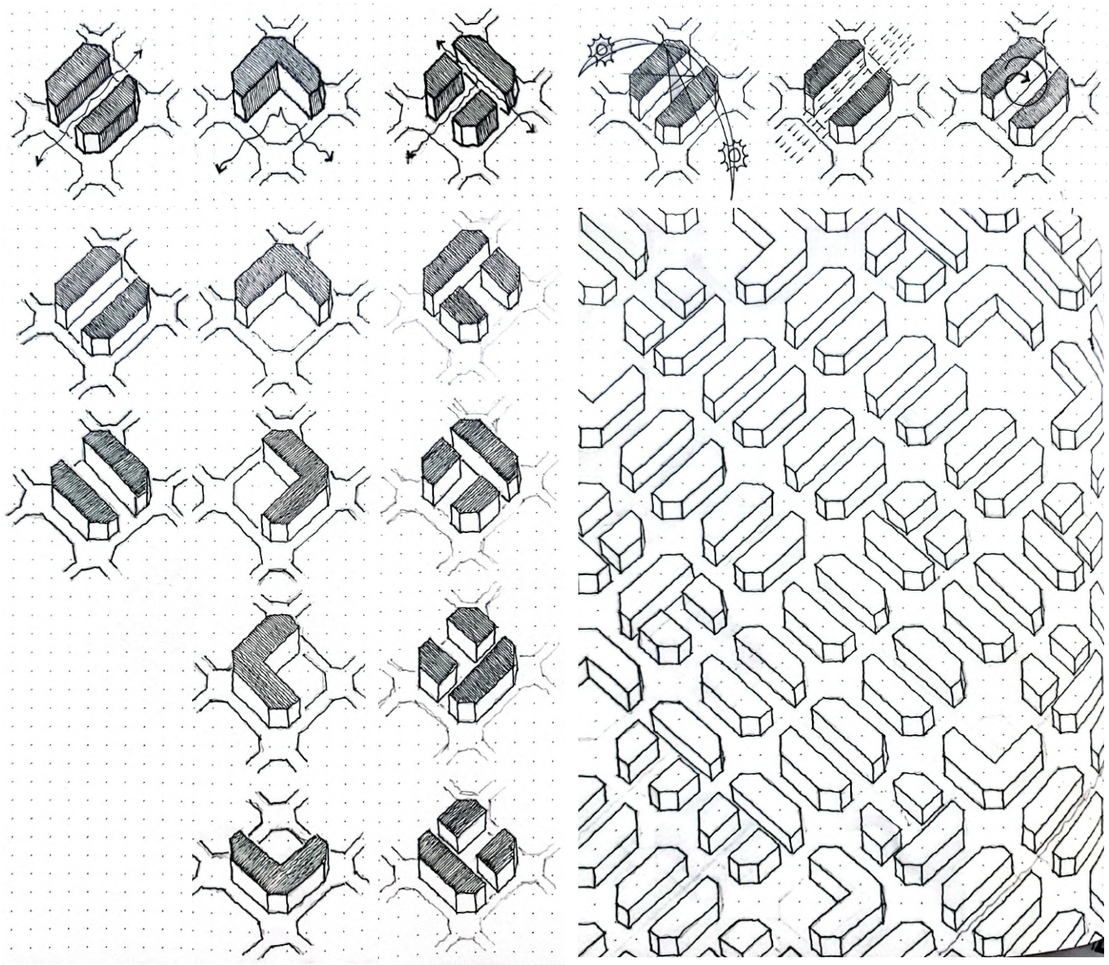
All the selected typologies have been carefully examined through various permutations by rotating them at 90-degree intervals. This process helped in understanding the spatial adaptability and performance of each typology in different orientations. By exploring these permutations, it was possible to assess how each form responds to site conditions, connectivity, ultimately aiding in identifying the most contextually appropriate and efficient urban layouts.

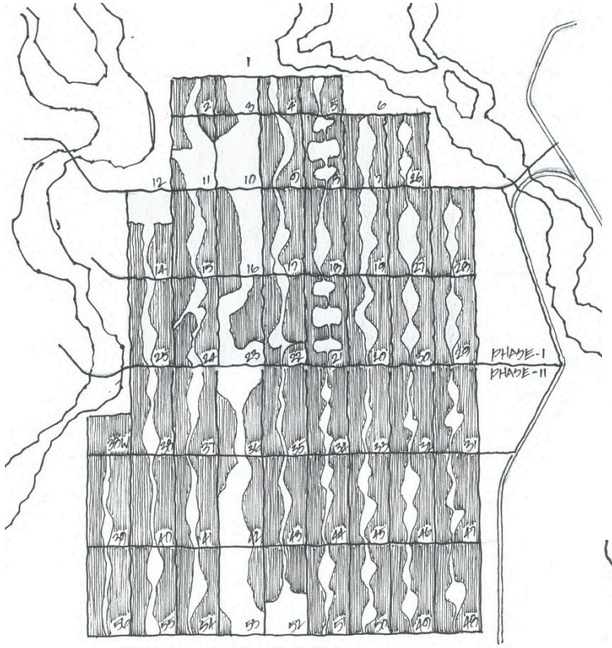
Permutations in Clusters

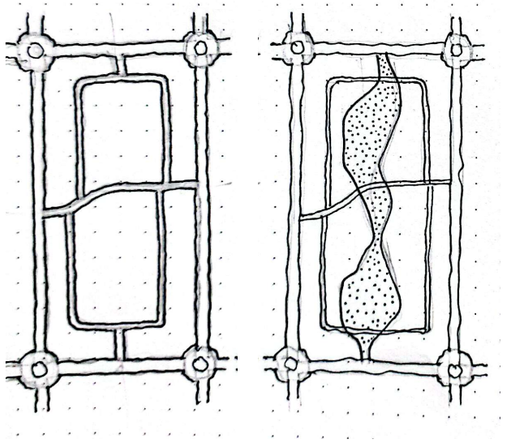
By arranging the selected typologies in appropriate sequences and exploring their spatial relationships, a variety of distinct cluster formations were generated. These clusters serve as the primary design strategy, allowing for a modular, adaptable, and context-sensitive urban structure. The idea was to move beyond rigid grid patterns and instead create flexible neighborhood blocks that encourage social interaction, mixed-use development, and pedestrian accessibility. Each cluster is composed by analyzing permutations of rotated typologies, ensuring spatial efficiency, optimal orientation, and variation in public and private realms. This method not only adds diversity to the urban fabric but also reflects the evolving nature of cities, accommodating future changes in population density, land use, and community needs. As a result, the clusters act as building blocks of a dynamic and inclusive city model tailored for Amaravati's future growth.

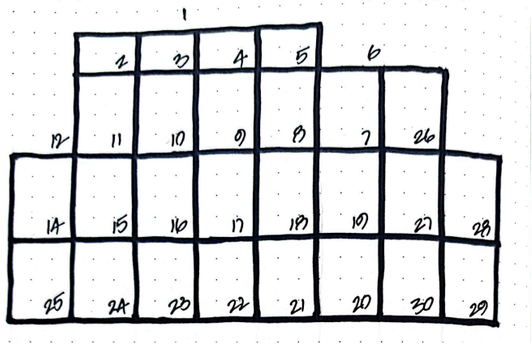


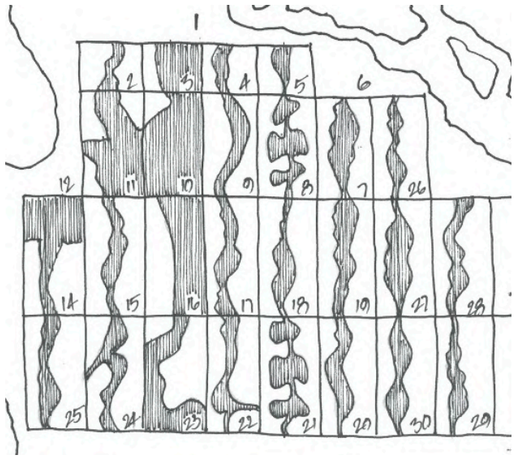
Concepts



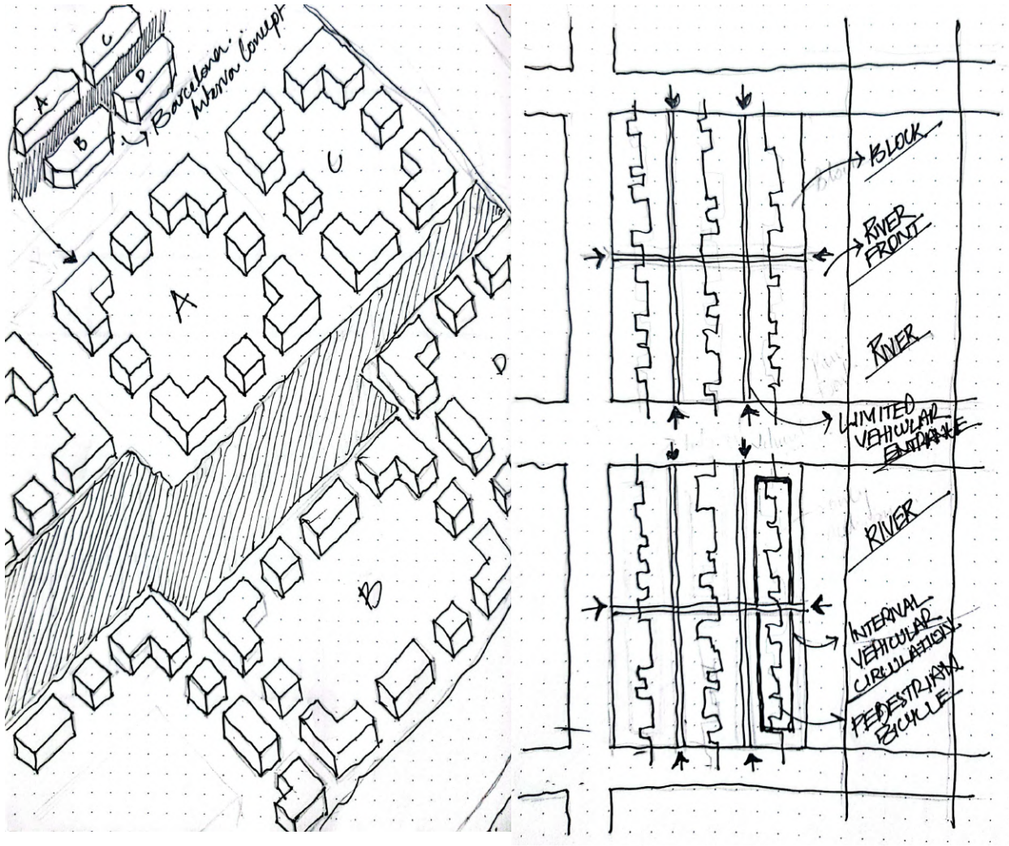


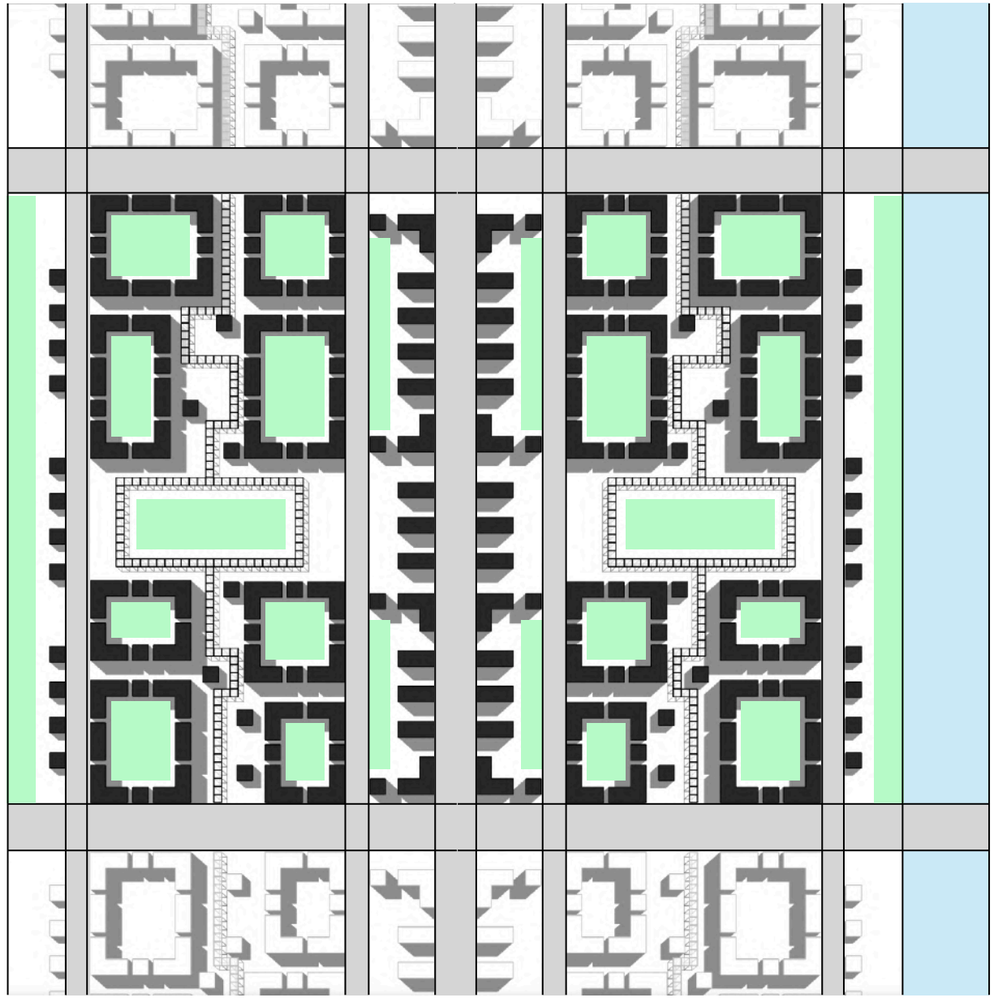




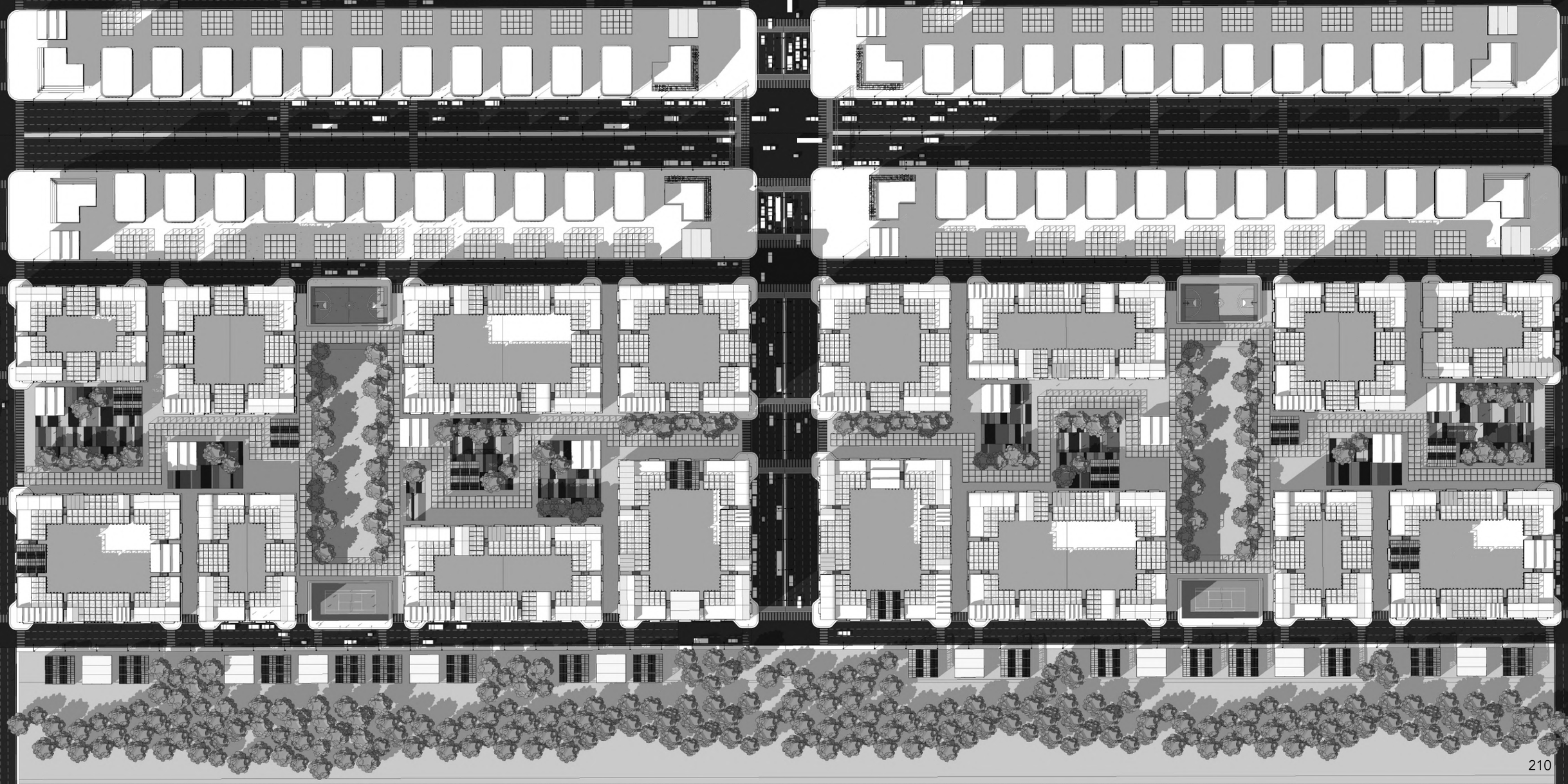


Concepts

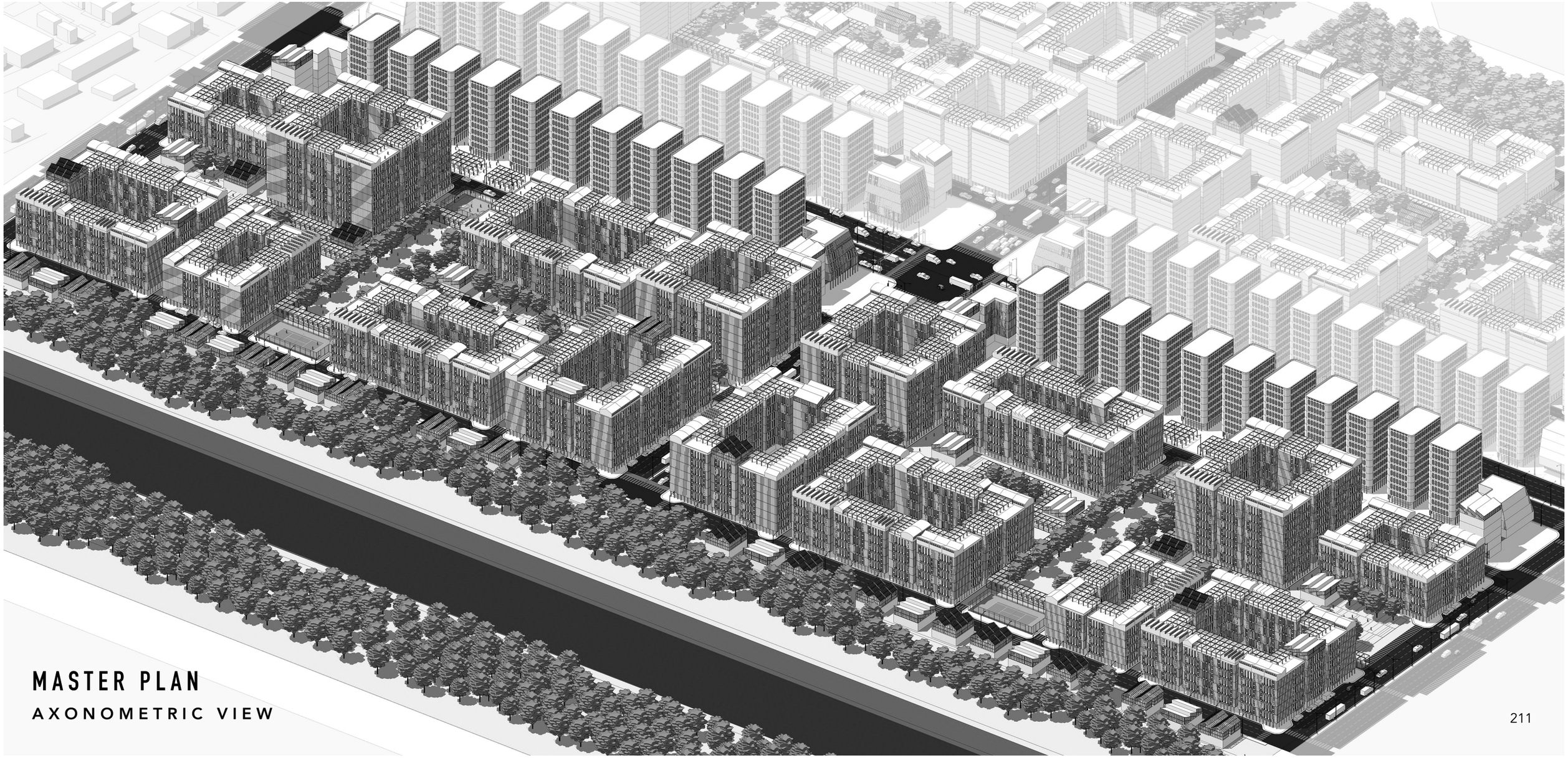

A
B
C
D
Barcelona Manzana Concept
BLOCK
RIVER FRONT
RIVER
LIMITED VEHICULAR ENTRANCE
RIVER
INTERNAL VEHICULAR CIRCULATION
PEDESTRIAN BICYCLE



PROJECT PROPOSAL



MASTER PLAN



MASTER PLAN

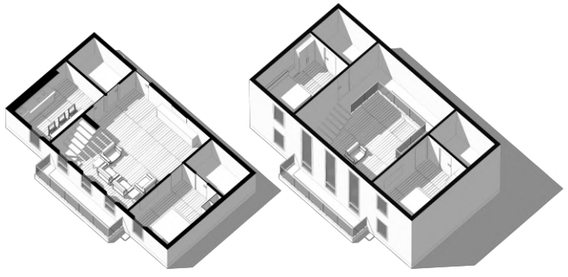
AXONOMETRIC VIEW

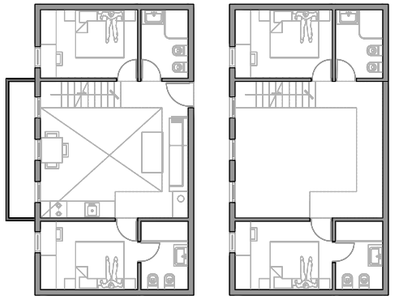
ENLARGE - 1

AXONOMETRIC
VIEW

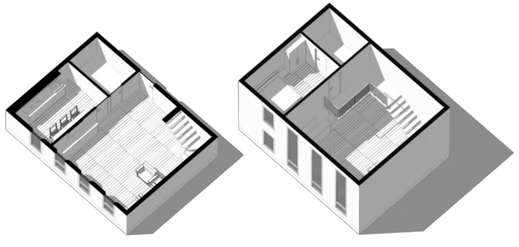
ENLARGE - 2

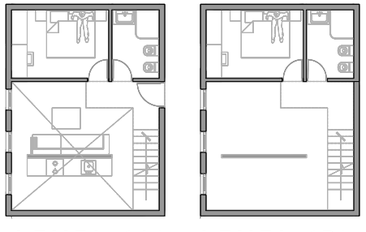
AXONOMETRIC
VIEW



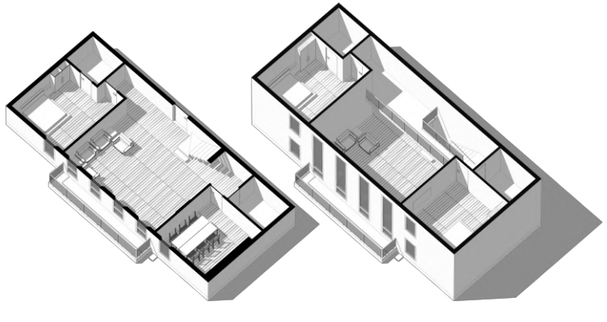


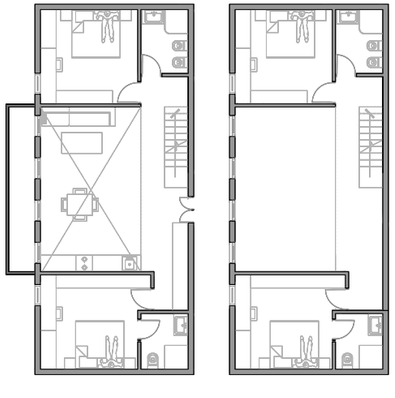
LEVEL (A) LEVEL (B)





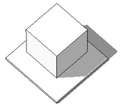
LEVEL (A) LEVEL (B)



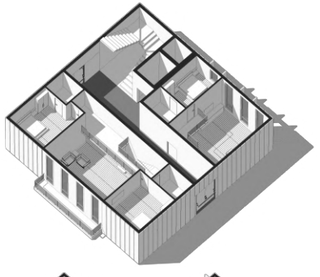


HOUSING UNITS 1, 2, 3
AXONOMETRIC VIEW

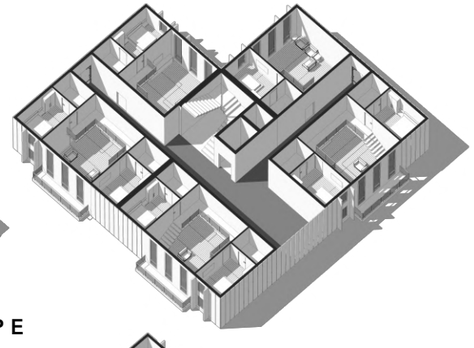
HOUSING UNITS 1, 2, 3
FLOOR PLANS

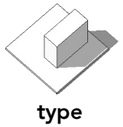


type
SQUARE

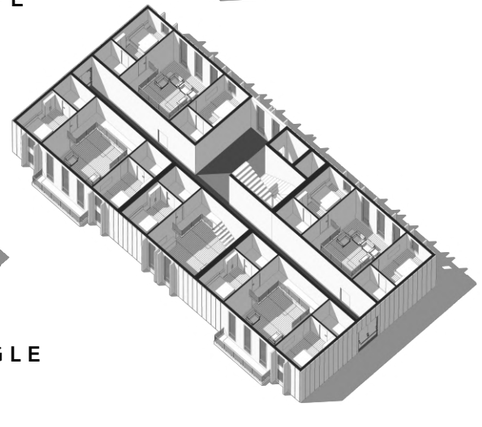


type
'L' SHAPE

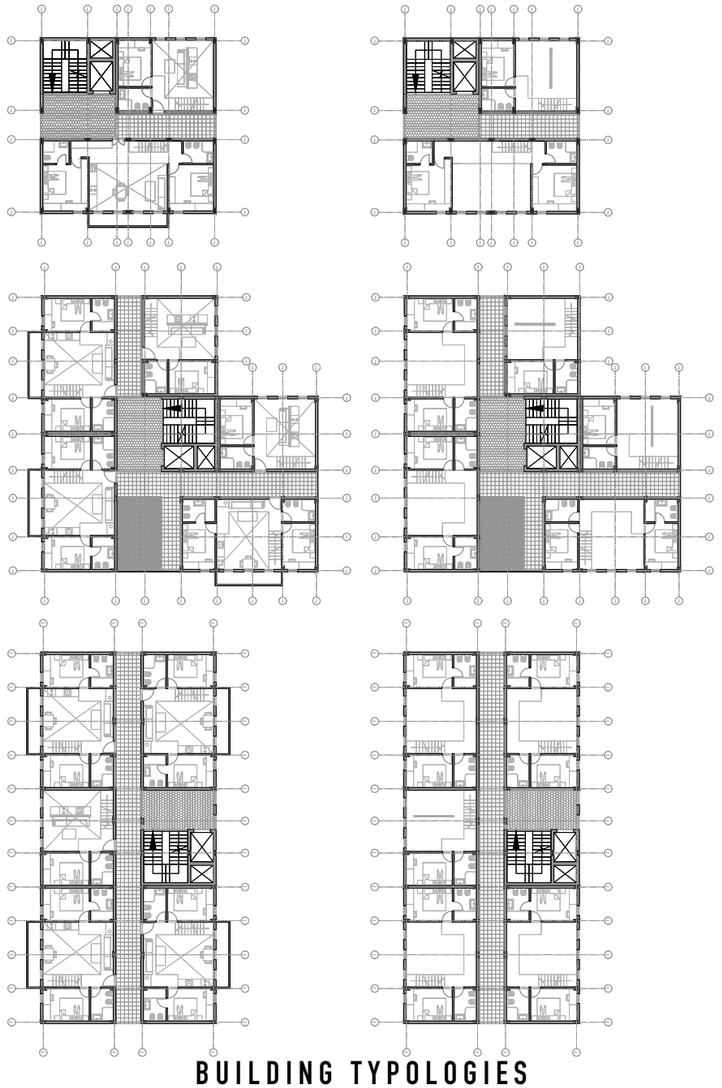




type
RECTANGLE



BUILDING TYPOLOGIES
AXONOMETRIC VIEW



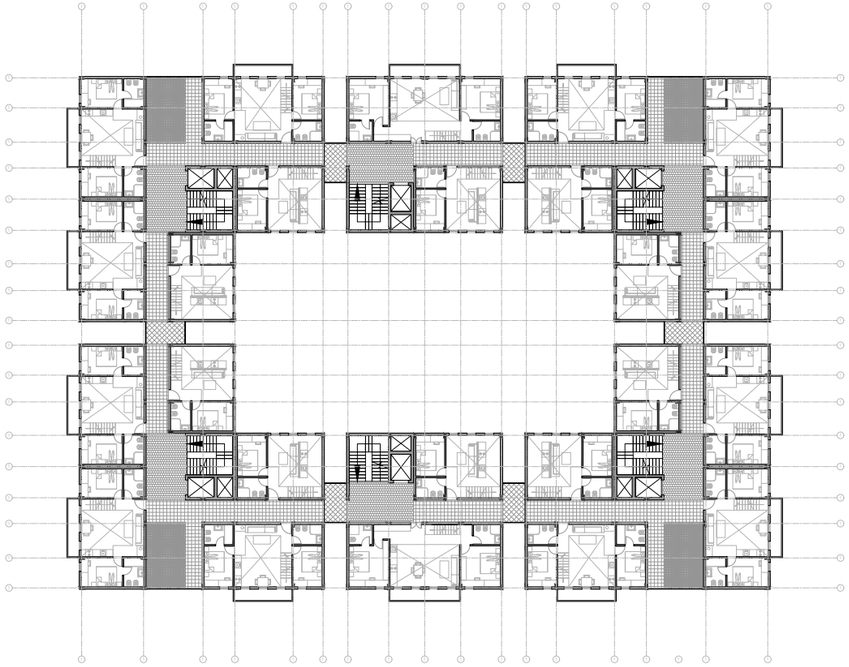
BUILDING TYPOLOGIES
FLOOR PLANS

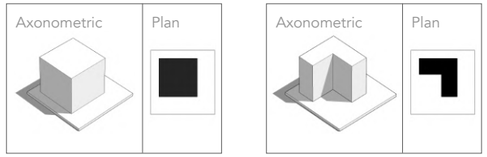
CLUSTER - 1

AXONOMETRIC VIEW

CLUSTER - 1

TYPICAL FLOOR PLAN

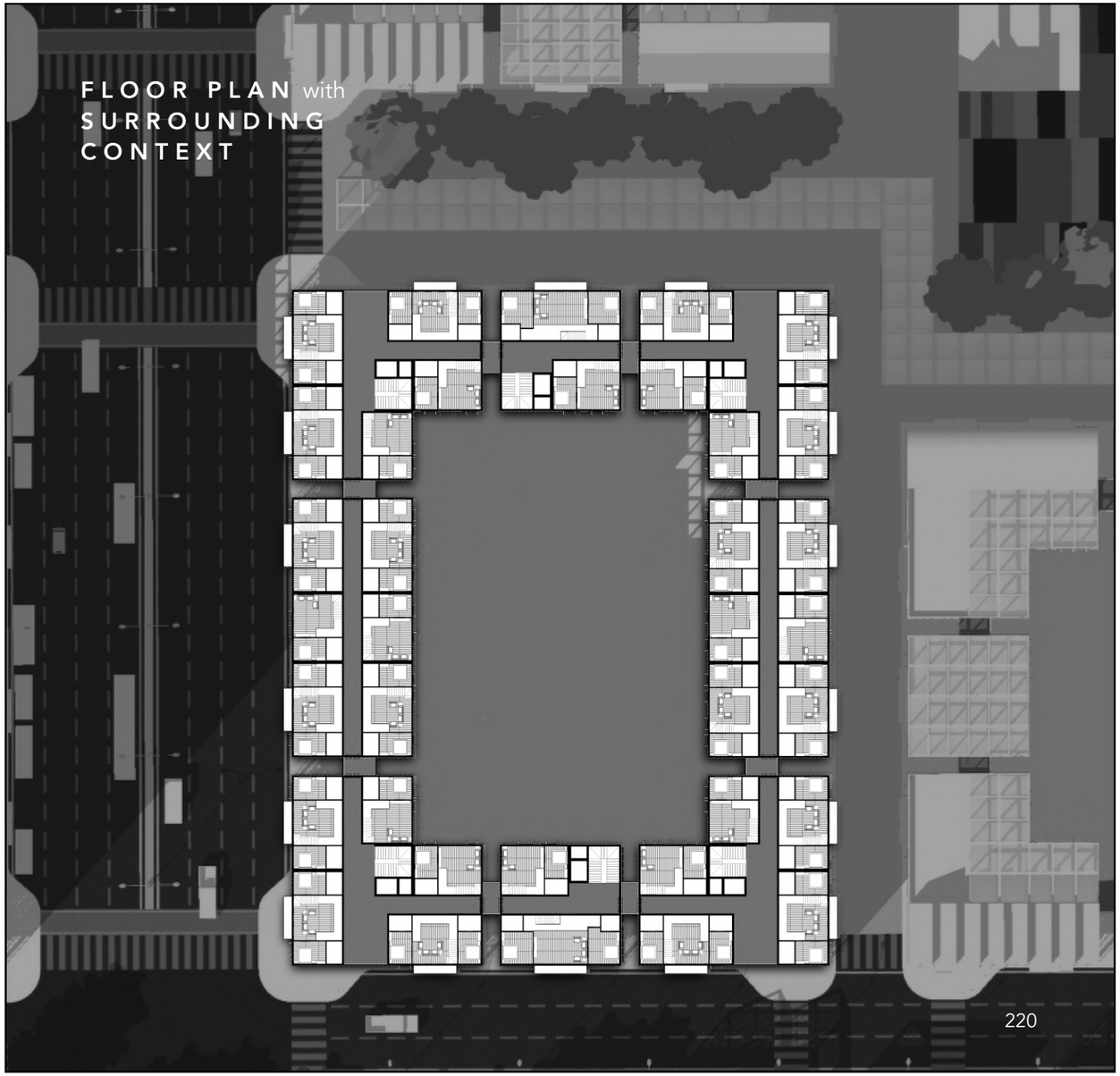




Different Typologies used to form CLUSTER

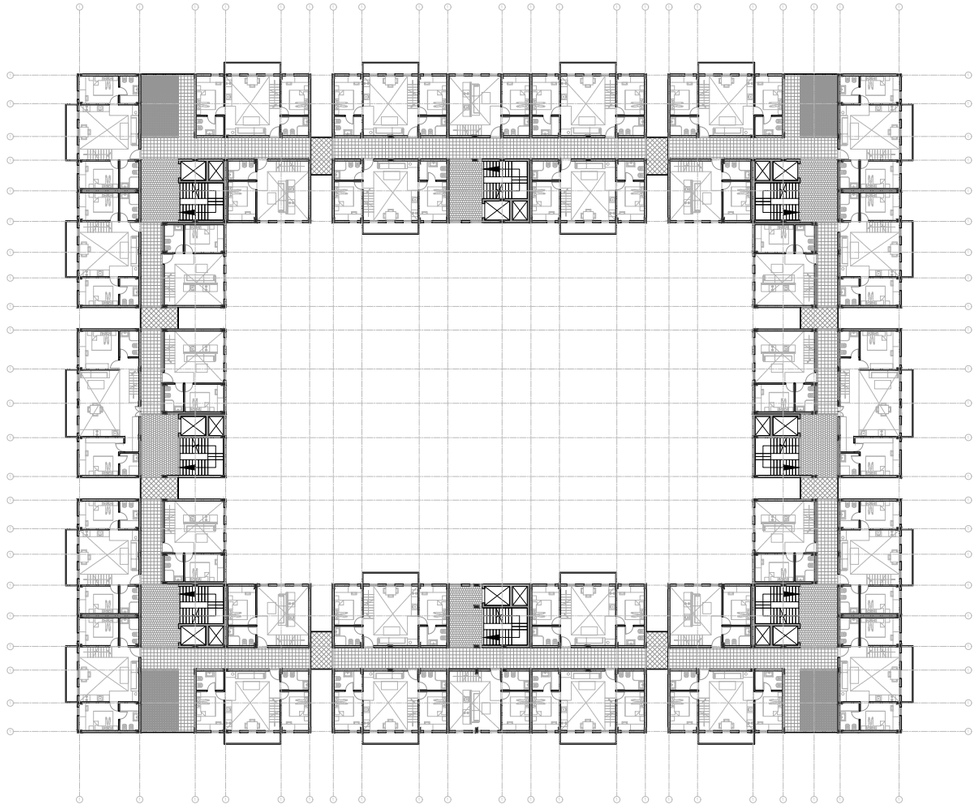
CLUSTER - 2

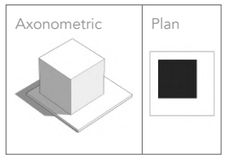
AXONOMETRIC VIEW

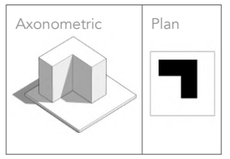


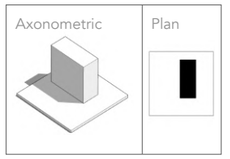
CLUSTER - 2

TYPICAL FLOOR PLAN



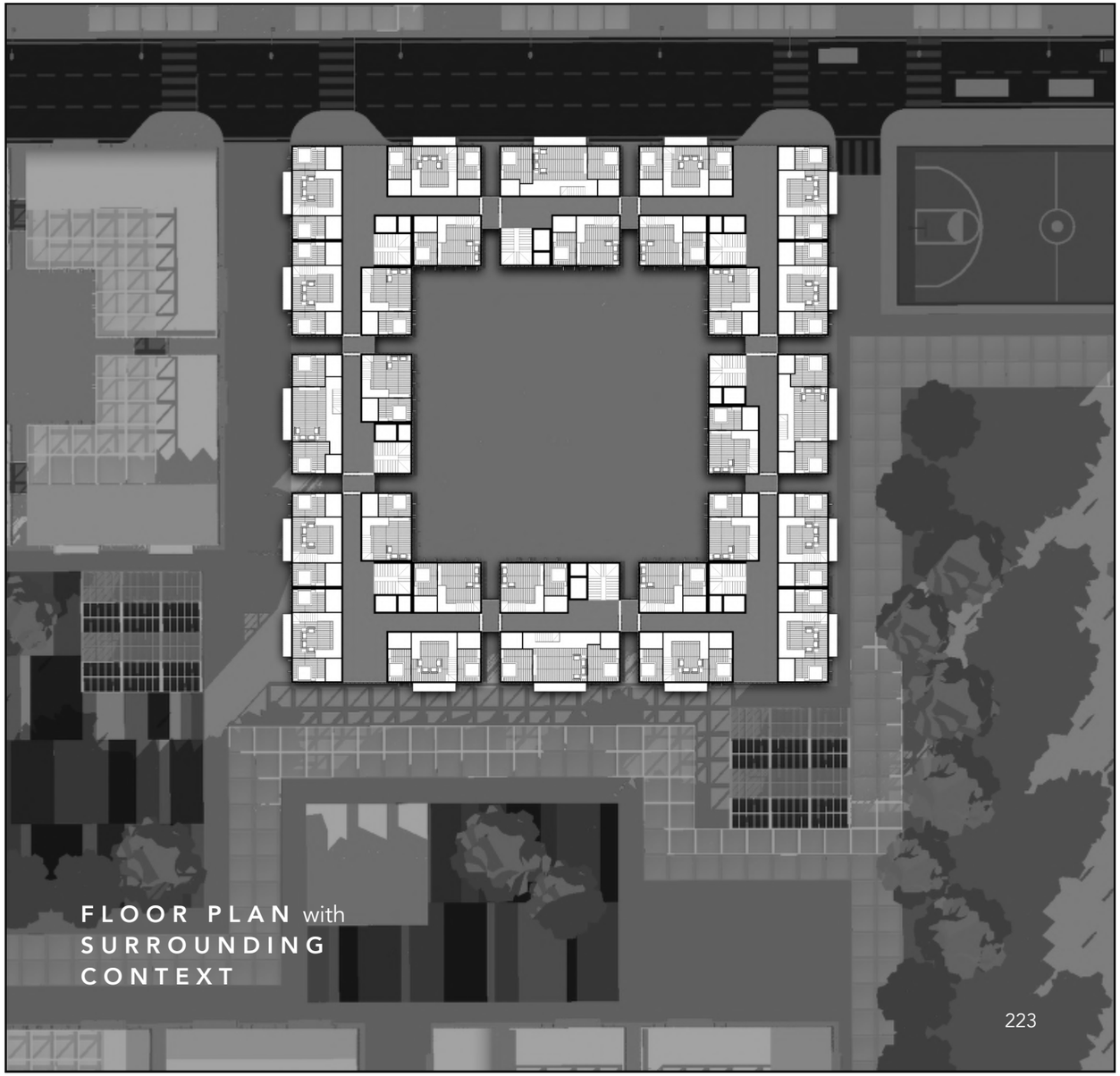






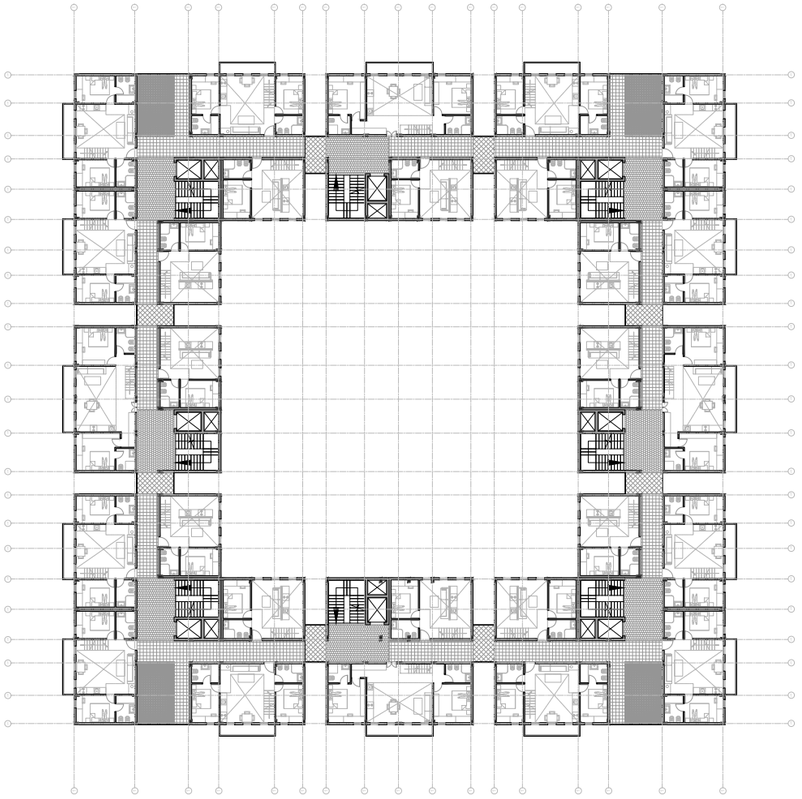
CLUSTER - 3

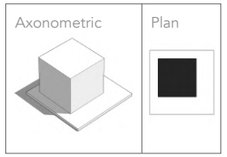
AXONOMETRIC VIEW

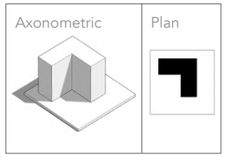


CLUSTER - 3

TYPICAL FLOOR PLAN

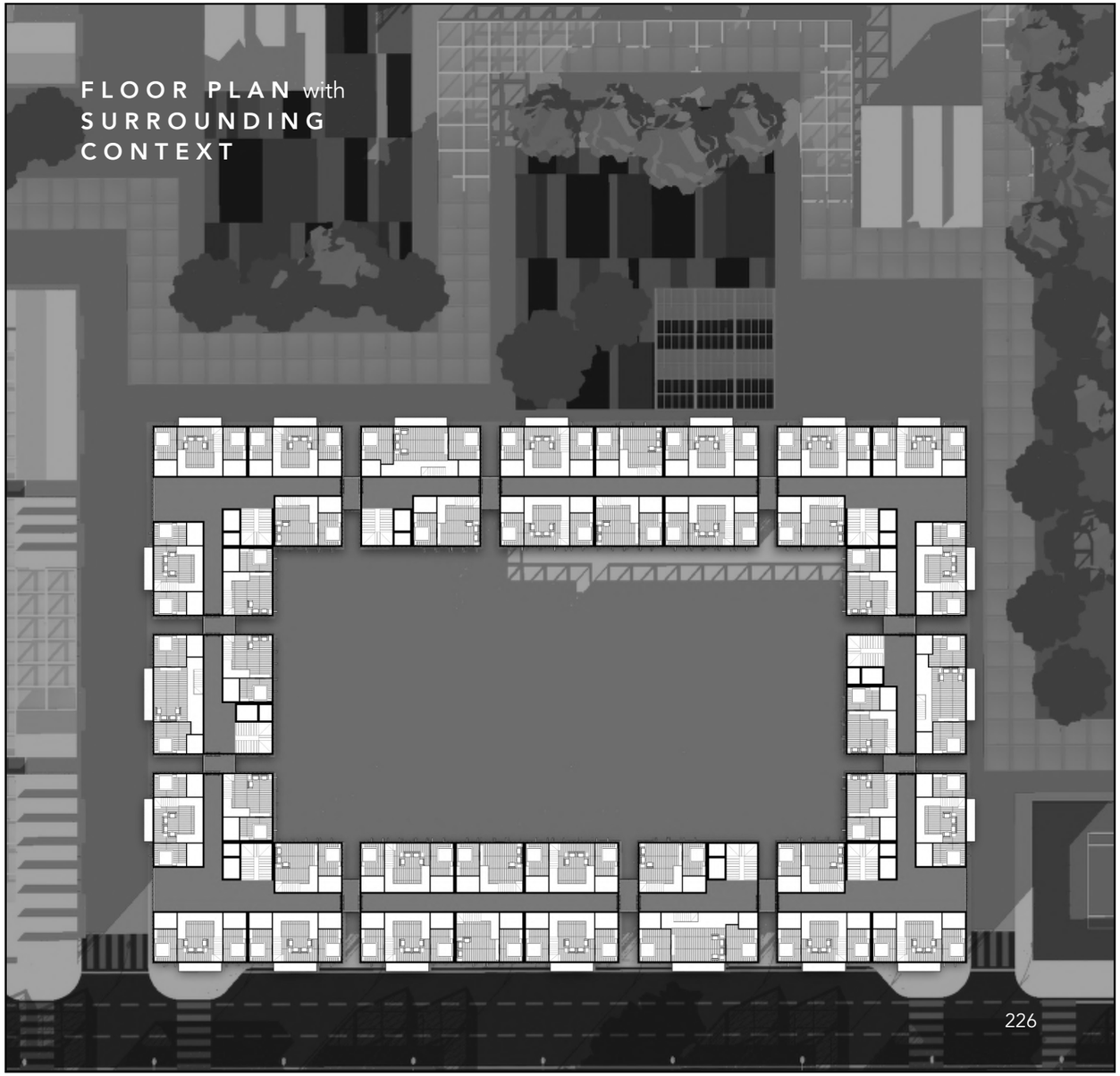






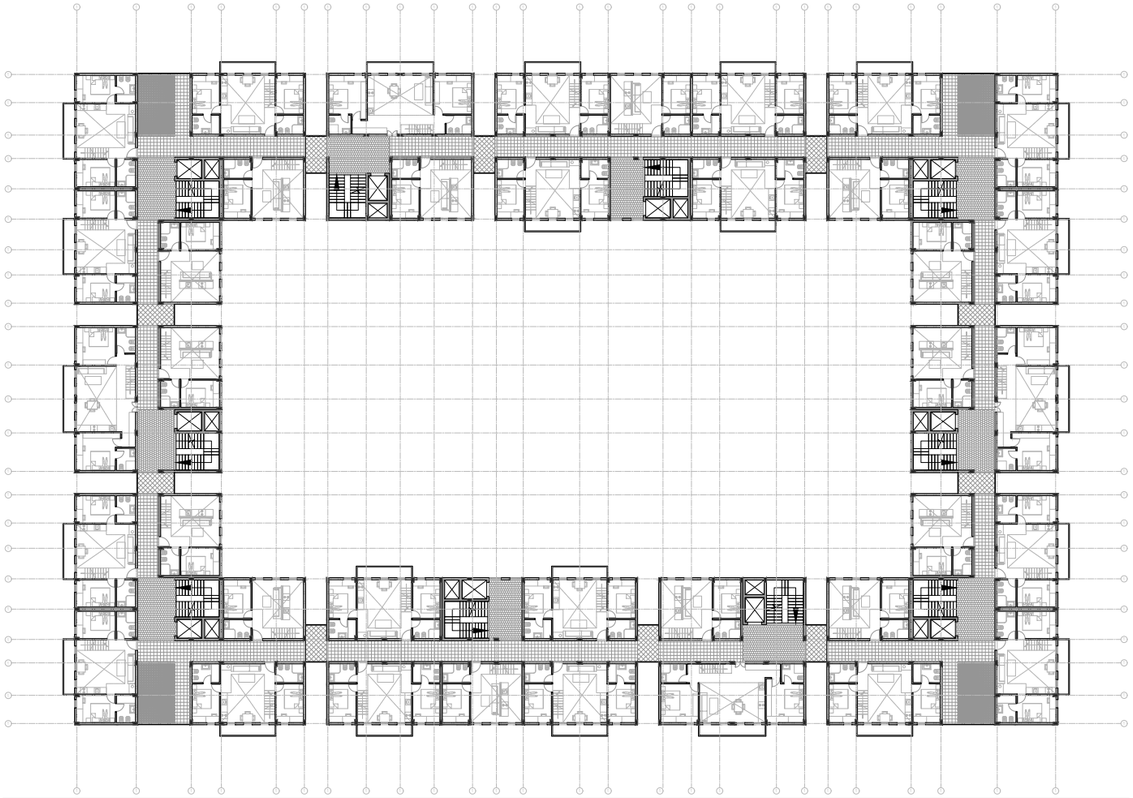
CLUSTER - 4

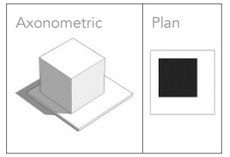
AXONOMETRIC VIEW

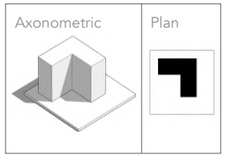


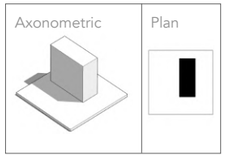
CLUSTER - 4

TYPICAL FLOOR PLAN



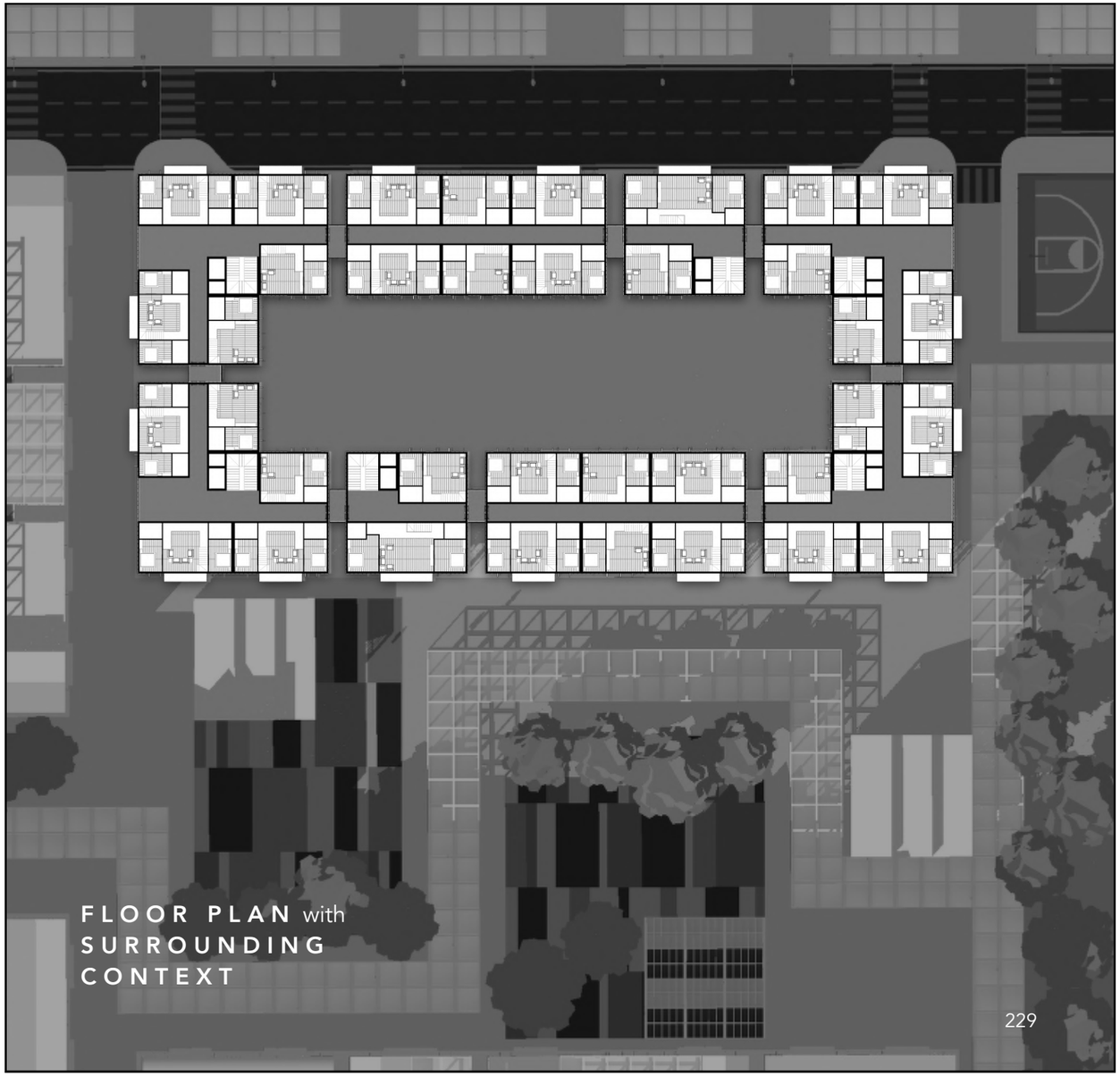






CLUSTER - 5

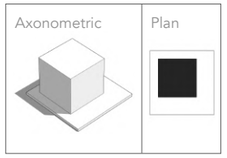
AXONOMETRIC VIEW

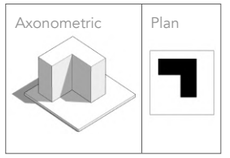


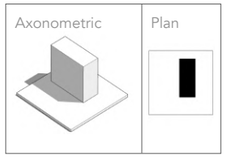
FLOOR PLAN with
SURROUNDING
CONTEXT

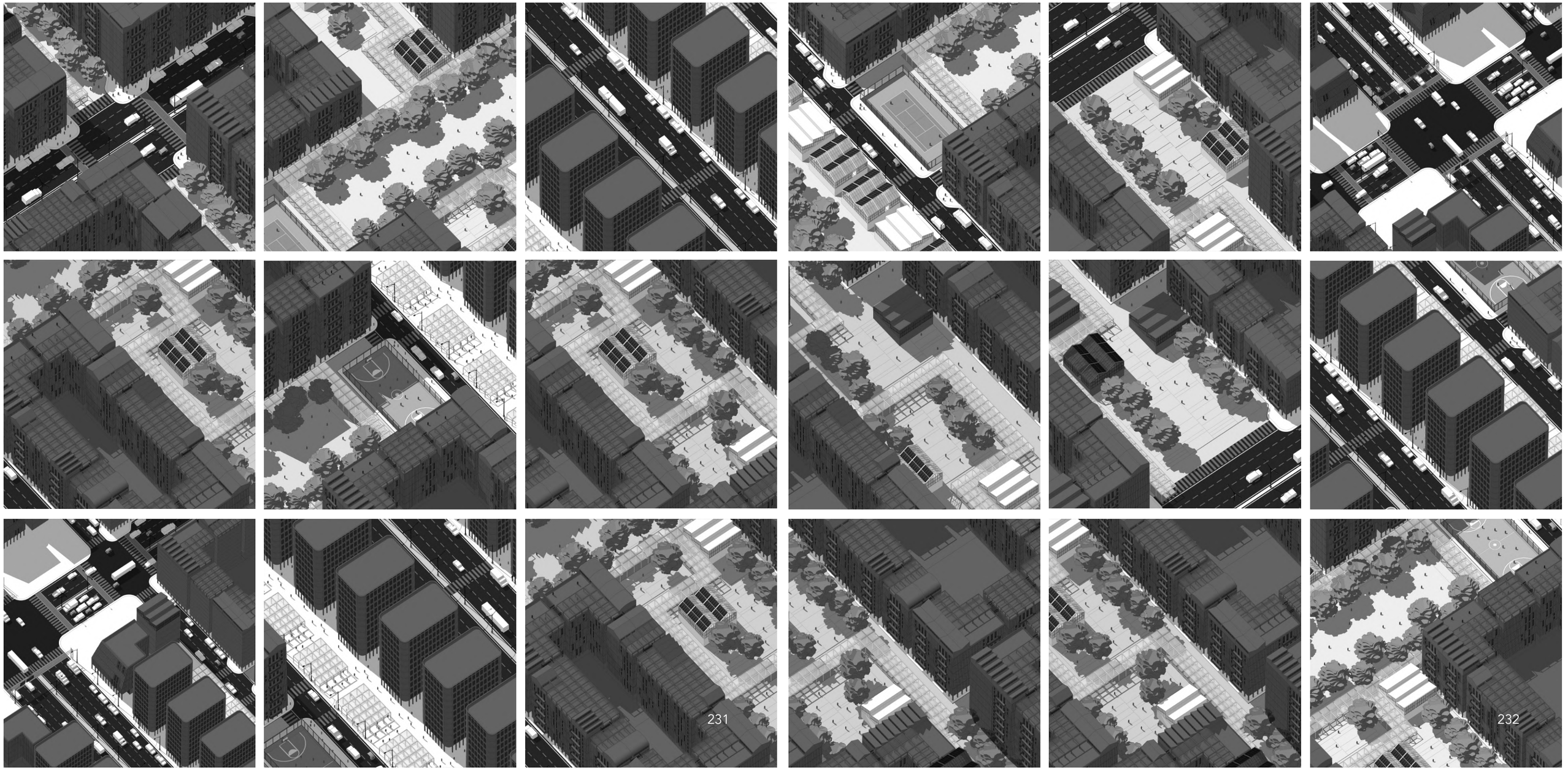
CLUSTER - 5

TYPICAL FLOOR PLAN





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232

6.5 CONCLUSION

The proposed design for Amaravati draws from the lessons of Barcelona, Chandigarh, and the principles of minimalism, reinterpreting them to suit the unique context of the site. Like Barcelona and Chandigarh, Amaravati too holds the advantage of being developed on largely open land, offering the rare opportunity to create a city free of rigid constraints and responsive to contemporary needs. One of the key inspirations has been the emphasis on green and breathing spaces: Cerda's vision of central green courtyards within the Barcelona block and Le Corbusier's continuous vertical green corridors in Chandigarh have been reimagined in this proposal through a network of interconnected courtyards and pedestrian-friendly clusters. These clusters not only provide community spaces but also prioritize non-motorized mobility, creating healthier and more inclusive environments.

The human-centered approach of Ildefons Cerdà, where blocks were designed to maximize light, ventilation, and user well-being, strongly informs the proposal. Instead of individual blocks, clustered courtyards with commercial ground floors are introduced, fostering both social interaction and economic vibrancy. Similarly, Le Corbusier's hierarchical road system has inspired a circulation framework that minimizes traffic within the core while ensuring accessibility, reinforcing the idea of functional order at the urban scale.

At the architectural level, the influence of Ludwig Mies van der Rohe's Farnsworth House highlights the potential of minimalism and open floor planning. By adopting open planning strategies, the design emphasizes flexibility, transparency, and connectivity within built spaces, aligning with the broader urban vision of openness and adaptability.

In essence, the proposed project is a synthesis of global urban design precedents and architectural philosophies, reinterpreted to create a city that is human-scaled, ecologically responsive, and socially engaging—an Amaravati that learns from the past while shaping a resilient future.

Key Elements to Notice in Proposed Project.

- **Integration of Green and Breathing Spaces:** Drawing inspiration from Cerda's vision of interior green courtyards in Barcelona and Le Corbusier's linear green corridors in Chandigarh, the proposal creates a multi-layered green system. Landscaped courtyards, linear parks, and pedestrian boulevards form a continuous network that not only enhances air quality and microclimate but also provides accessible recreational spaces for the community.

- **Cluster-Based Urban Blocks:** Unlike Cerda's singular blocks, the design proposes clusters of buildings organized around shared courtyards. These courtyards serve as social and interactive spaces, while the in-between areas are reserved for pedestrian and cyclist movement only, ensuring a human-centered and safe environment.

- **Pedestrian and Cyclist-Friendly Streets**: Inspired by Barcelona's walkable streets and the breathing spaces between Cerda's blocks, the design prioritizes **non-motorized transport** within cluster zones. Commercial activities on the ground floor activate the streets, creating lively, inclusive, and economically vibrant public spaces.

- **Efficient Road Network and Sectoral Planning**: Borrowing from Le Corbusier's 7V road hierarchy in Chandigarh, the proposal adopts a **controlled vehicular circulation system**. Each sector/cluster has limited vehicular access points, ensuring **smooth traffic flow, reduced congestion, and safer residential environments**.

- **Community-Oriented and Human-Centered Design**: Echoing Cerda's philosophy that cities should serve the people, the design ensures that the **end-user remains the primary focus**. Public spaces, pedestrian pathways, courtyards, and commercial hubs are all arranged to encourage interaction, inclusivity, and a high quality of urban life.

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