



Theories of Architecture

ENAR 329

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Lecture 5

Modernity and Modernism

30th October 2021

A Summary

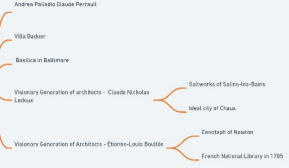
THEORIES OF ARCHITECTURE

1450-1500 Renaissance
Structures as works of art rather than structural necessities.

1485-1500 Brunelleschi Architecture
Seen as odd, irregular - vs. sturdy, order, balance, logic of "born classical (Brunelleschi?)".

1700s Neoclassicism
Reaction of art and architecture was onto and made through usage of grid, creamy, pastel like colors for light colors.

1750-1900 NeoClassical Architecture
was symptomatic of a desire to the perceived "purity of the arts of Rome and the 'ideal' Greek arts and to a lesser extent to the 16th century Renaissance Classicism.



Late 19th century Eclecticism. The word eclecticism is derived from the Greek word ἐκλεκτικός, which loosely means "to choose the best"



Mid 18th century Neo Gothic A reaction towards the constant copying of previous styles such as the classical style. They wanted to become free of Roman and Greek Architecture.



18th-19th century Industrial Revolution
This transition included going from hand production methods to machines.



Bauhaus Arts School. Movement during the span of 1880 to 1930 in the United States.
Tech, science and industry were very important to Bauhaus Architecture and the industrial needs of the period, most notably the Industrial Revolution, Bauhaus Architecture pioneered the use of new materials such as cast iron, piping.



Walter de D'Arcy
left his marks on Notre-Dame cathedral. He had advanced knowledge of structural physics which he used to save crumbling buildings.



1880-1910 Arts and Crafts Movement
A style that urged for a return to craftsmanship and which rebelled against industrialization.



1880-1910s Art Nouveau
Artists/architects desired to break all connections to classical times.



1890-1910 Chicago School
One of the distinguishing features of the Chicago School is the use of steel-frame buildings with masonry cladding → allowing large plate-glass window areas and limiting the amount of exterior ornamentation.



1890s and 1900s City Beautiful Movement



20th Century Futurism
Antonio Sant'Elia expressed his ideas of modernity in his drawings for La Città Nuova



Arguing that the term makes any style, movement, or architect that breaks with precedent and is "new" in movement and fundamental posture.

Functionalism

Functionalism is based on the principle that **the design of a building should reflect its purpose and function.**

The central idea of “form follows function” was infused with the idea of using architecture as a means to physically create a better life for citizens.

“The House is a machine for living in “ Le Corbusier

“Form ever follows function” Louis Sullivan

“Who ever regrets that the house of the future can no longer be constructed by craftsmen should bare in mind that the motorcar is no longer built by the wheelwright”

Mies van der Rohe

A *wheelwright* is a craftsman who builds or repairs wooden wheels.

What is functionalist architecture?

Functionalist architecture is essentially **architecture that is designed primarily to satisfy the purpose for which the building is intended for .**

-The appearance of the building, its shape and decoration should be a secondary concern to the requirement for the building to work well for its users, to be functional.

-In 1896 Louis Sullivan expressed his belief that 'form ever follows function', meaning that a building's appearance (form) should be determined by the most practical relationship of its necessary parts (functional considerations).

-In this way Le Corbusier believed a house could become 'a machine for living in'.

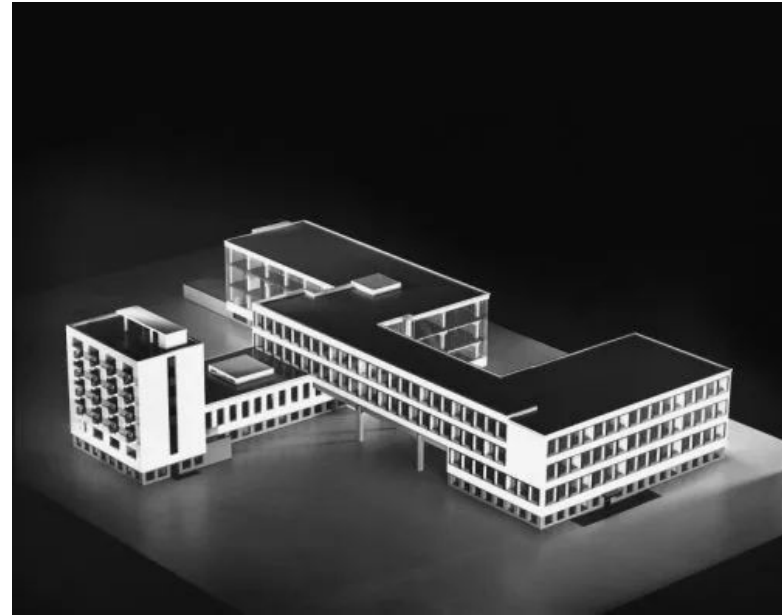
In his 1923 publication Towards a New Architecture Le Corbusier exhorted architects to adopt the same rational process as the designers of aeroplanes, typewriters, bicycles and ocean liners.

Bauhaus functionalism The architectural style most associated with functionalism is that of the German Bauhaus School. The term 'Bauhaus' is an expression meaning 'house for building'.

Walter Gropius, **The Bauhaus, Dessau**, Germany

1925 -26 Functionalist features:

- In Each distinct function is given its own space and visual expression- workshops, classrooms, residences, auditorium/cafeteria.
- Architectural form is determined by the practical arrangement of functions. No ornamentation
- The building was rational and utilitarian, like a machine.



Mies van der Rohe, Seagram Building

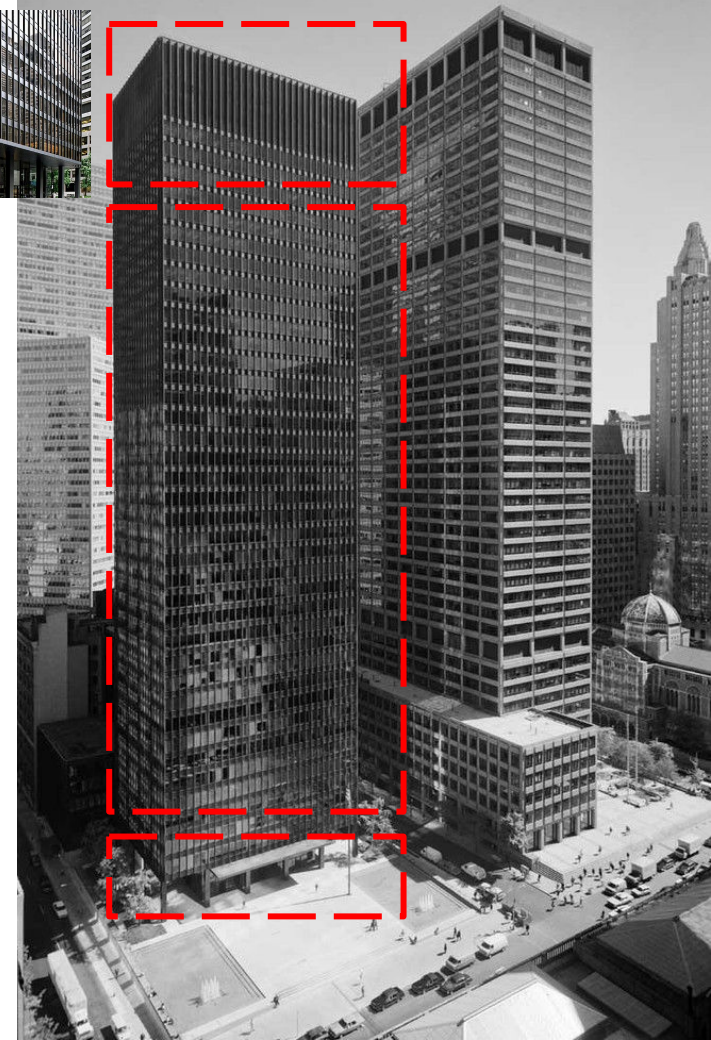
Functionalist features:

-The building has a tripartite division like the base, shaft and capital of a column following a formula prescribed by Louis Sullivan.

-The separate functions of street-level **entrance reception**; of **high rise levels of modular office spaces**; and of the **top-most mechanical and service areas** are given distinct architectural expressions.

-The building has a rational functional appearance with its machine-like precision, its clean lines, modular components, rigidly geometric forms and metal skeleton.

-**The metal frame allows for each floor to be open-plan** and to be divided with partition walls independently of the configuration of other levels.

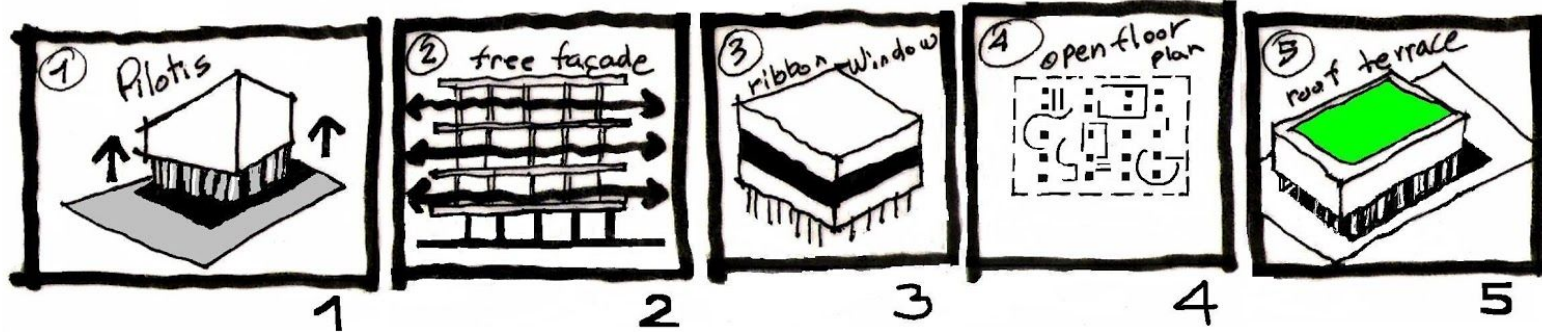


**Seagram Building
1958**

Le Corbusier (1926) and the 5 points of Architecture

5 points of modern architecture based on the ideas of living in the industrial world by Le Corbusier (1926)

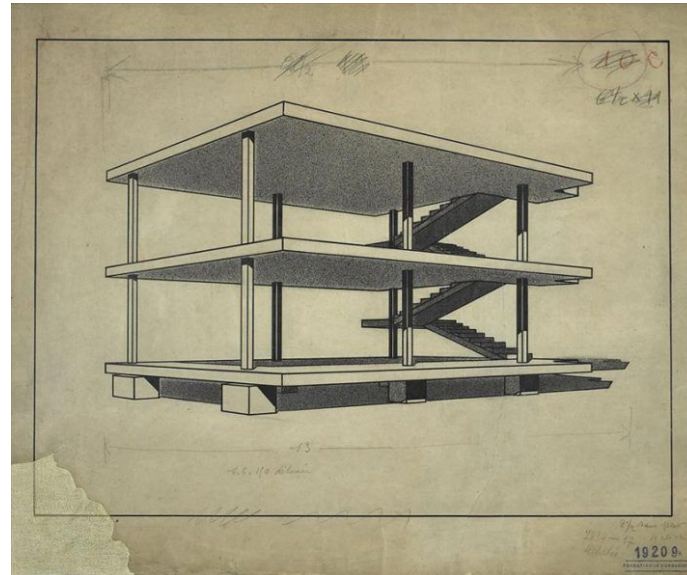
Five principles of modern architecture were first published in the journal *L'Esprit Nouveau* in 1926. The magazine founded by Le Corbusier, poet Paul Derme and artist Amed Ozenfant in 1920 and specialized in literature, visual arts and architecture.



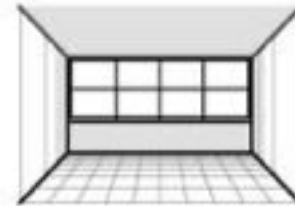
1. Pilotis – Replacement of supporting walls by a grid of reinforced concrete columns that bears the structural load is the basis of the new aesthetic.



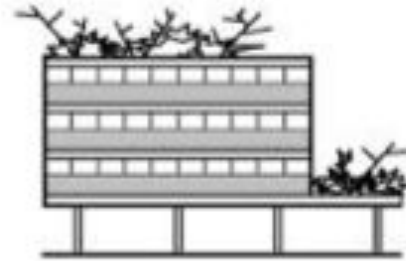
3. The free design of the façade—separating the exterior of the building from its structural function—sets the façade free from structural constraints.



4. **Ribbon Window;** The absence of load-bearing walls allows making windows of any shape and size. Horizontal windows throughout the facade increase the level of insolation and increase the sense of space.



5. **Roof gardens** on a flat roof can serve a domestic purpose while providing essential protection to the concrete roof



The Villa Savoye is the best example of 5 points of modern architecture in use

Villa Savoye in Poissy, France, 1929-1931.

- The house is being built on stilts to separate it from the ground and make efficient use of the space.
- Historical ornaments are entirely absent.
- The active use of white colour was associated with novelty, purity, simplicity
- The construction has a free layout.
- Unconventional and dynamic spiral staircases and ramps
- Horizontal windows
- Roof garden

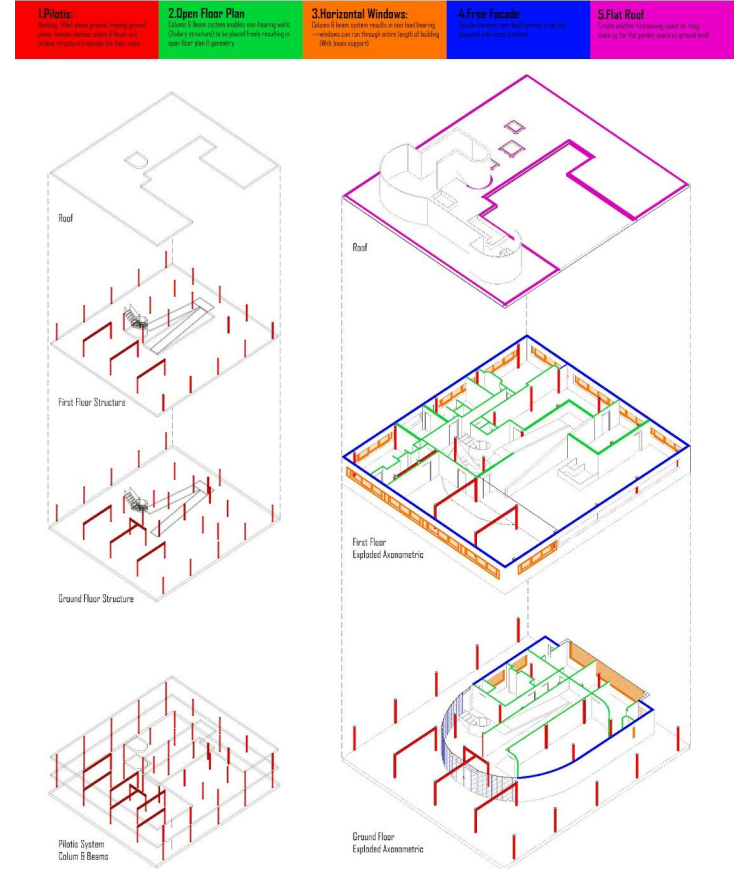
Stilts are poles, posts or pillars that allow a person or structure to stand at a height above the ground.

https://www.youtube.com/watch?v=f1womjgDI_I



Structural Analysis

Le Corbusier's 5 Points of Architecture



The five points became a kind of guideline for the New Architecture, as Corbusier used to call it. Even after decades, new technologies, materials, and demands of society have continued to update those architectural solutions, announced almost a century ago as the basis for a new architecture.

Pilotis

Lifting a building over pilots frees the ground floor for the circulation of people and vehicles. This fundamentally modern solution is still used today to promote free spaces, with a stronger connection between the public sphere and the building's private spaces.

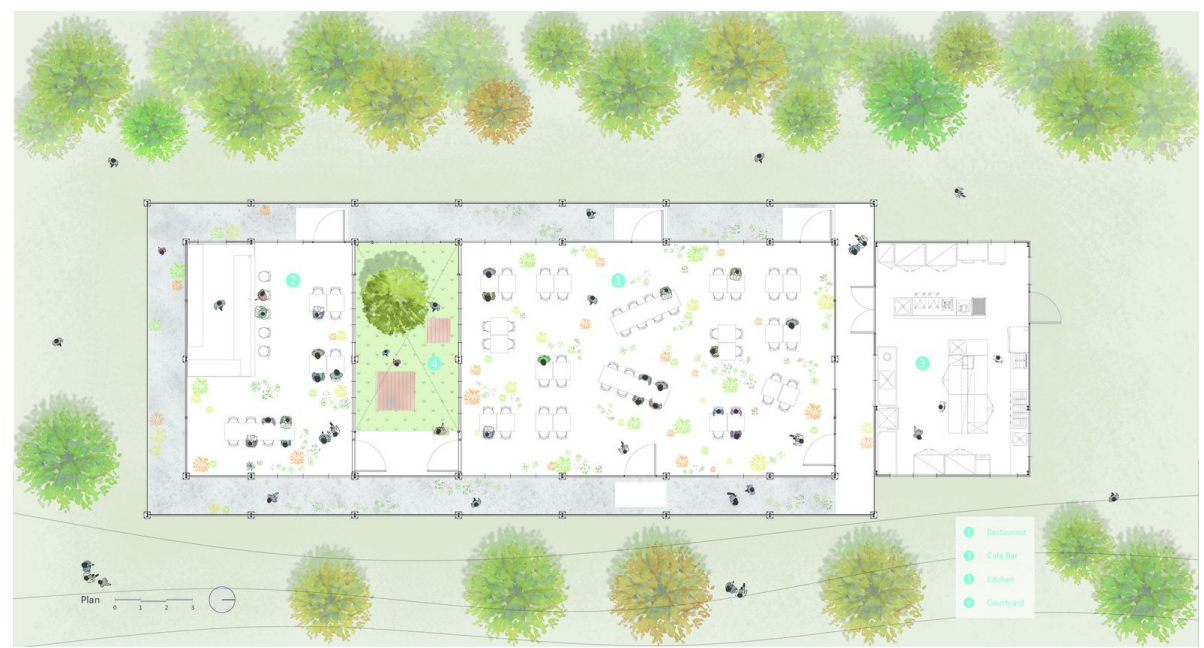


Office Buildings - Kráľová pri Senci, Slovakia-2019

The office part, built on lightweight platform, is supported by inclined steel pillars that emphasize the elegance of the building. So do rounded corners, and monochromatic materials (concrete, glass, steel).

Free Design of the Ground Plan

The free design of the ground plan is achieved by creating an open plan, freeing the floor plan from structural conditioning so that the partitions and internal spaces of the building become more flexible and integrated. This feature allows for future changes in the building, expansions, or moving partition walls.



Restaurant, Sustainability
•Kaohsiung, Taiwan (ROC) [2019](#)

Green-house is a home for plants that provides a luminous environment. The challenge of this project is to house both plants and humans under the same roof in a subtropical climate with suitable materials and design.

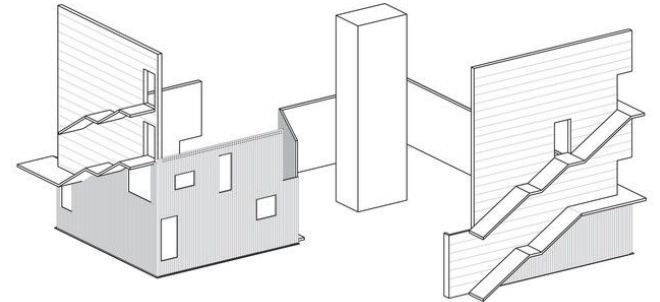
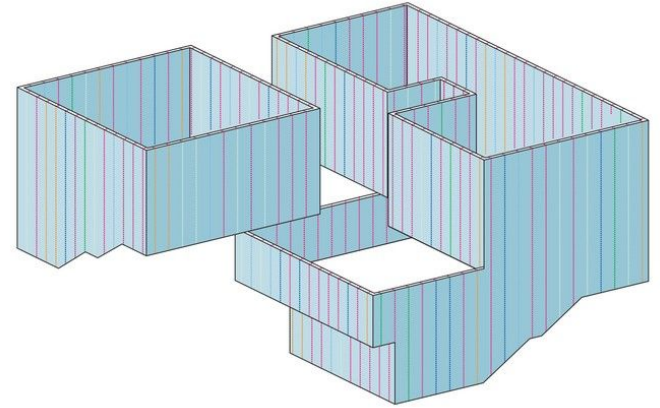
Free Design of the Facade

Separating the structure from the walls creates not only a free floor plan but also a facade that allows more freedom for windows and openings. As a result, non-structural walls can also enable the installation of horizontal windows, yet another one of the five points for a new architecture.



Library
• Changnyeong-gun, South Korea -2009

Paju Book City is a 125 hectare “Urban Wetland” that is being developed for the publishing industry in South Korea. Our firm was among a select group of foreign architects invited to design individual buildings within this innovative master plan. The client is a young web publishing company looking for light, open and interconnected workspaces.



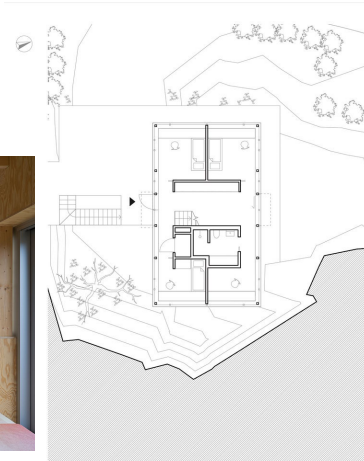
Horizontal Windows

Horizontal windows are generous openings that cut through the entire length of the building's facade, providing more indoor lighting and panoramic views of the exterior. Many contemporary projects display variations of this feature by exploring different styles and positions of the window frames.

Villa Oreveien / Lie Øyen Arkitekter

Houses

•Drøbak, Norway 2019

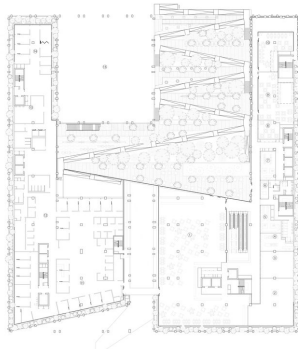


Roof Garden

A roof garden, or green roof, is a flat roof that offers additional living space, in contrast to traditional roofs. In the last decades, roof gardens have become very popular, and the improvements in materials and waterproofing systems have allowed for even more freedom when designing this architectural solution.

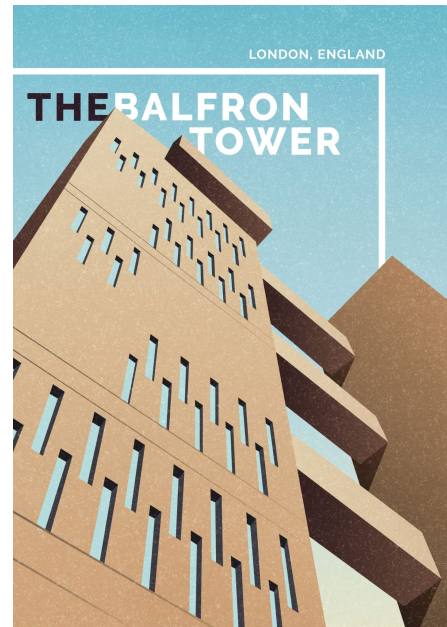
Punggol Neighbourhood and Polyclinic /
Serie Architects + Multiply Architects

Mixed Use Architecture, Community Center
•Singapore -2018



Brutalism

What is an 'Urban Project'? The 'Urban Project' is an integrated way of thinking about making places in our cities. The projects that are not solely the design of buildings but of integrated places that included: infrastructure, streets, parks, squares, public buildings, shops and other places for work as integrated environments for housing.



Brutalist architecture

An architectural style that was quite popular in mid 20th century from the 1950s up until the 1980s, especially in civic projects and institutional buildings and in the form of sculpture-, brutalist architecture **establishes the right of building materials and structural features to be seen, admired and even celebrated.**

Interestingly, **the term ‘brutalism’ has nothing to do with the cold, menacing aggro of this architectural style; the word is derived from the French phrase, *béton brut*, meaning ‘raw or unfinished concrete’.**

In fact, the negative perceptions around brutalist architecture could be attributed to this word association – such buildings are often seen as **unfriendly, intimidating and even uninhabitable.**

Brutalism is considered one of the most divisive among all architectural styles, thanks to the strong emotions it evokes amongst the design community as well as the masses.

The genesis of the brutalist design movement can be credited to French-Swiss Modernist architect Le Corbusier, who over a career spanning 50 years, designed several buildings across the world and is known for pioneering reinforced concrete columns that could support the weight of the building.

Bare concrete columns, for instance, were a signature aesthetic of his buildings.

Following the war, Corbusier was commissioned to design a social housing project for the working class in Marseilles, France.

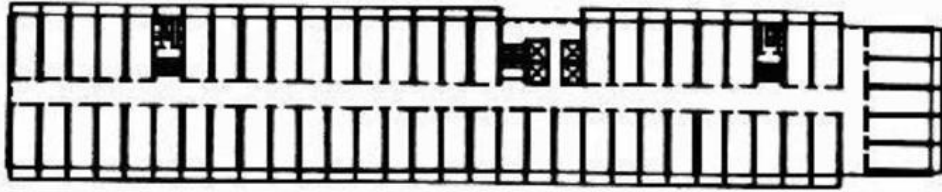


Built in 1952 to house up to 1600 people in 337 apartments, the **Unité d'Habitation** represents the birth of brutalism –

the building's massive reinforced concrete framework, modular apartments and absence of decorative features kick-started a whole new architectural style that was embraced across the world and remained popular for almost three decades.

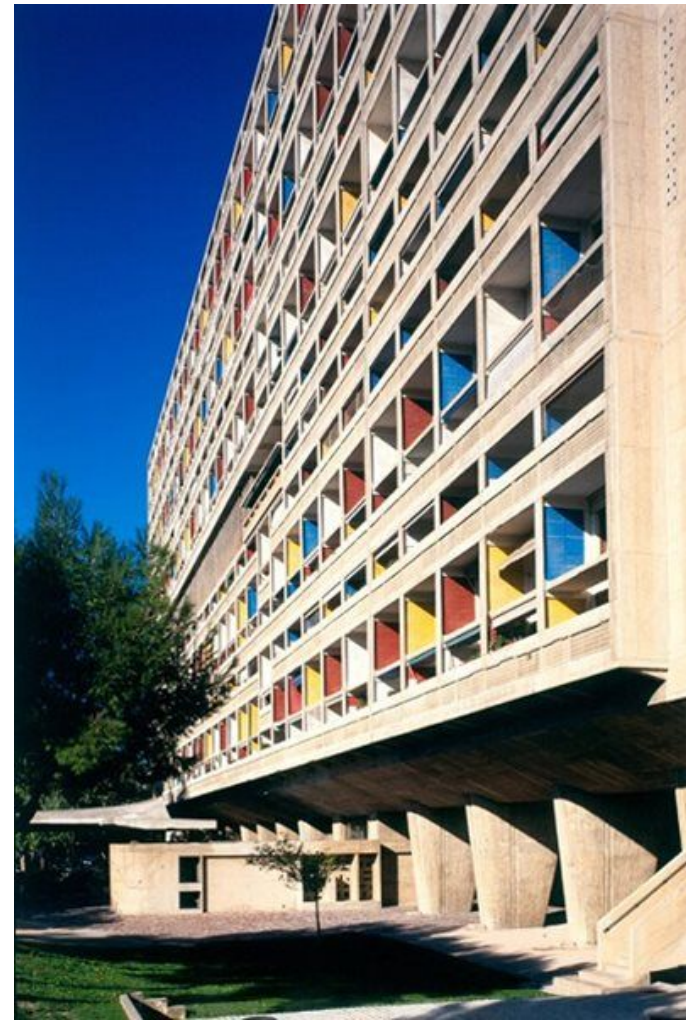


Le Corbusier's idea of bringing the villa within a larger volume that allowed for the inhabitants to have their own private spaces, but outside of that private sector they would shop, eat, exercise, and gather together.

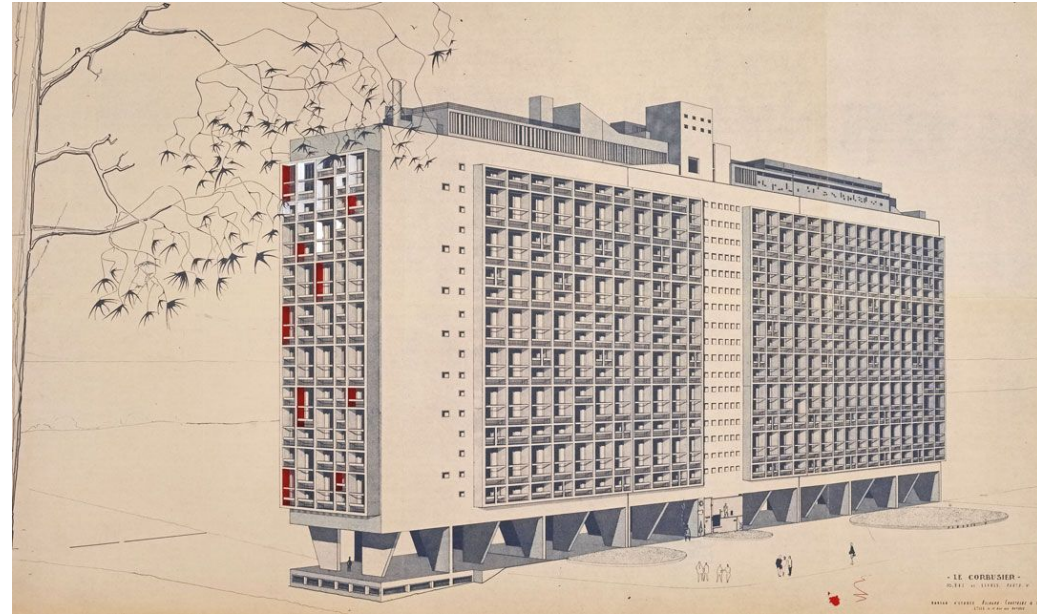


GreatBuildings.com

With nearly 1,600 residents divided among eighteen floors, the design requires an innovative approach toward spatial organization to accommodate the living spaces, as well as the public, communal spaces. Interestingly enough, the majority of the communal aspects do not occur within the building; rather they are placed on the roof.



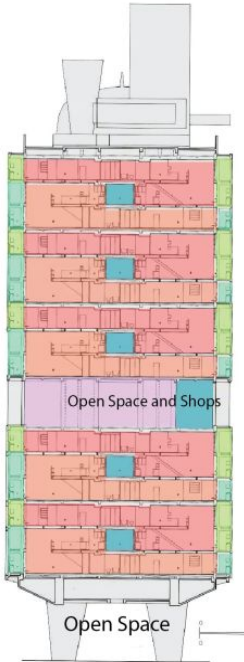
Le Corbusier believed **the tower block was the solution for rehousing the masses that had been displaced during the second world war, and that high rise building could be used to create spacious city homes with the same amenities as a typical street.**



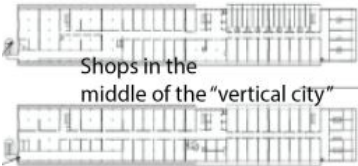
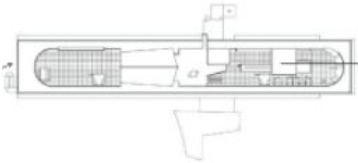
The Unite d’Habitation is essentially a “city within a city” that is spatially, as well as, functionally optimized for the residents.

Characteristics:

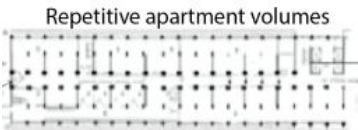
- Separation of public spaces from private apartments
- Colour is the only ornament . All else is raw concrete .
- Stacking and interlocking of individual apartments
- Visual emphasis on tectonic structure and form.



Open space and Garden



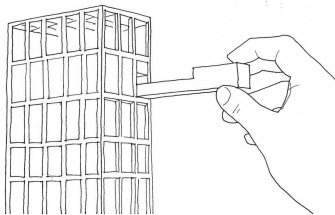
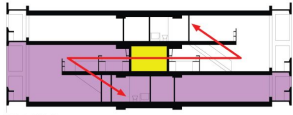
Shops in the middle of the “vertical city”



Repetitive apartment volumes



Free the ground



All apartments are building blocks, which fill a simple cuboid volume.

<https://www.youtube.com/watch?v=hhPxGwlxcMU>

Habitat 67, designed by architect Moshe Safdie as the Canadian Pavilion for the World Exposition of 1967, **was originally intended as an experimental solution for high-quality housing in dense urban environments.**

Safdie explored the possibilities of **prefabricated modular units** to reduce housing costs and allow for a new housing typology that could integrate the qualities of a suburban home into an urban high-rise.



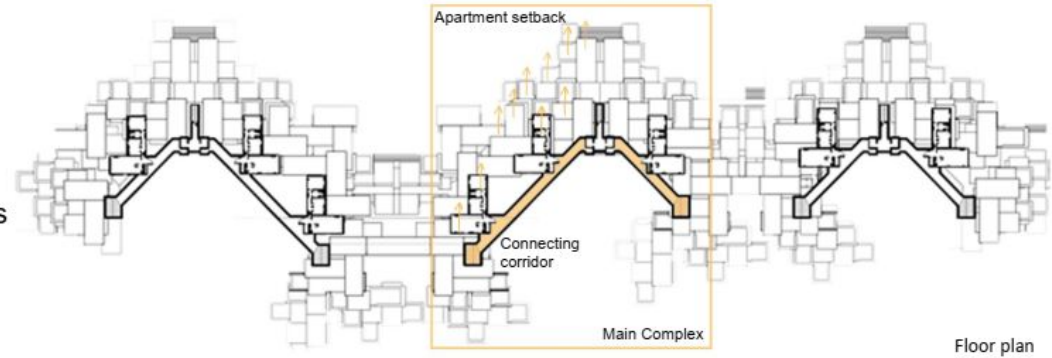
By stacking concrete “boxes” in variant geometrical configurations, Safdie was able to break the traditional form of orthogonal high rises, locating each box a step back from its immediate neighbor. This ingenious **method provided each apartment with a roof garden, a constant flow of fresh air and a maximum of natural light**: qualities which were unprecedented for a twelve story apartment complex. Habitat 67 thus pioneered the integration of two housing typologies—the suburban garden home and the economical high-rise apartment building.





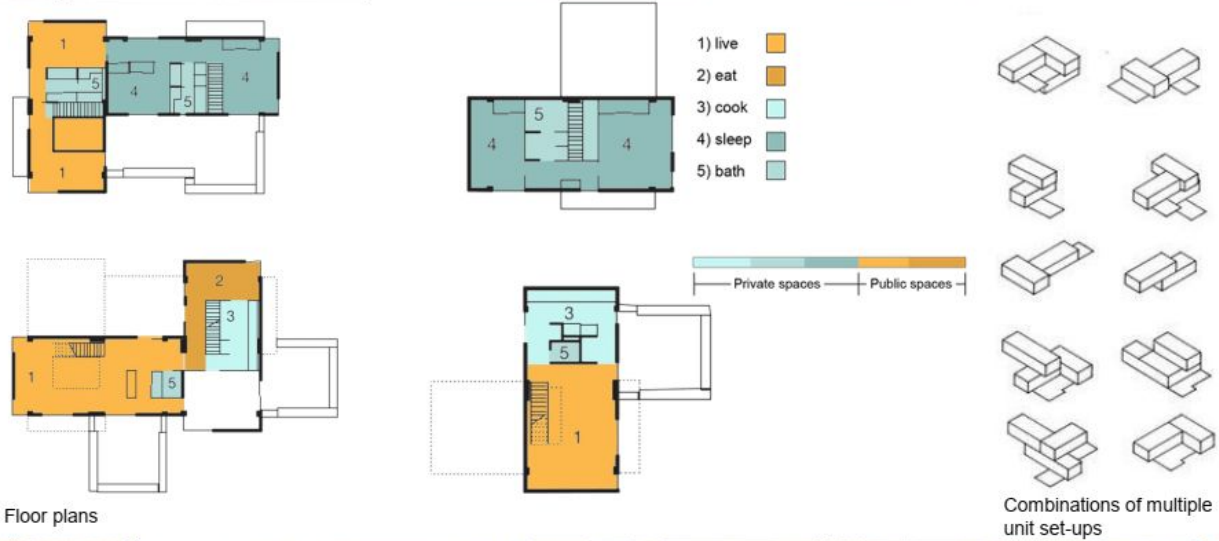
Habitat '67 pioneered the combination of two major housing typologies – the urban garden residence and the **modular high-rise apartment building**. The Habitat '67 is actually **12- storey complex** (158 dwelling units) with the following main characteristics:

- 15 models varying between 1 and 5 modules
- Views on 3 sides and landscaped terraces
- Surface areas vary from 624 to 3,000 square feet,
- Spread out over 1, 2, 3 floors
- Private terraces from 225 to 1,000 square feet
- 6 elevators
- Walkways at various levels giving access to residences
- Central heating and air conditioning





- The apartments consist of one to four 55m² boxes creating various configurations.
- All of the houses have one 20m² to 90m² **private roof garden**.
- Each unit looks similar to the rest, creating a **common external appearance**. But every house is different when it comes to the interior, as the resident can transform his space.



Circulation – access

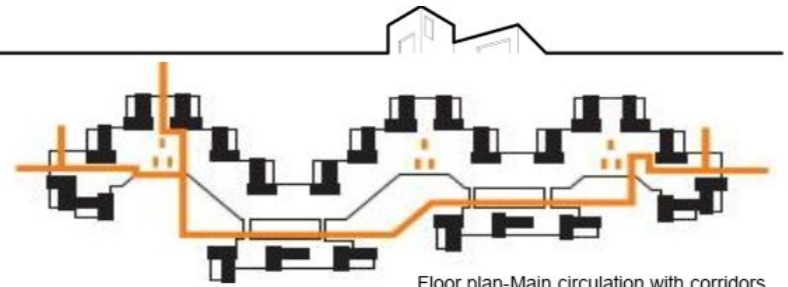
▪ Common circulation

Circulation within the habitat is achieved through 18 **external corridors**- streets 7 **stair shafts** and 6 **elevator shafts**, without the elevator being the main access to upper stories as it stops at every fourth floor.

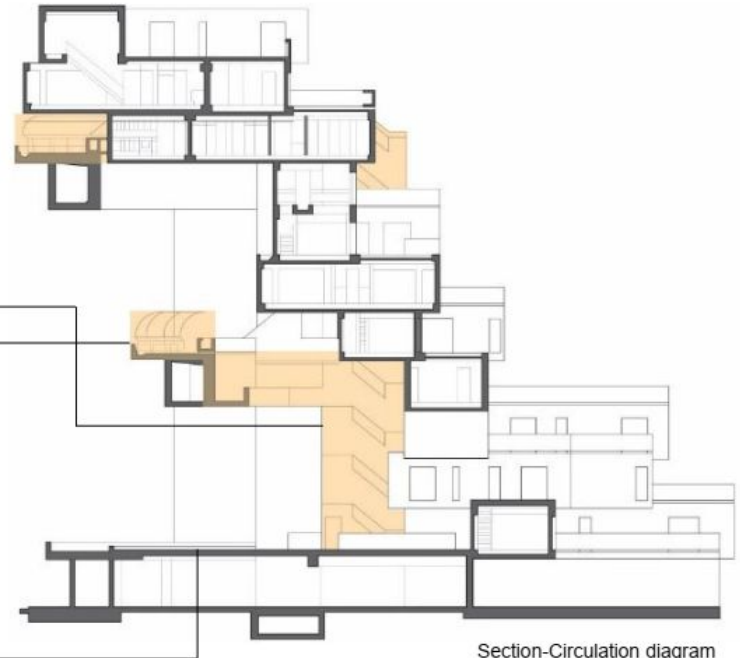
▪ Private circulation

Many of the apartment consist of more than one boxes that are interconnected through small staircases

The circulation system gives to the habitat the essence of a vertically developed village.



Floor plan-Main circulation with corridors

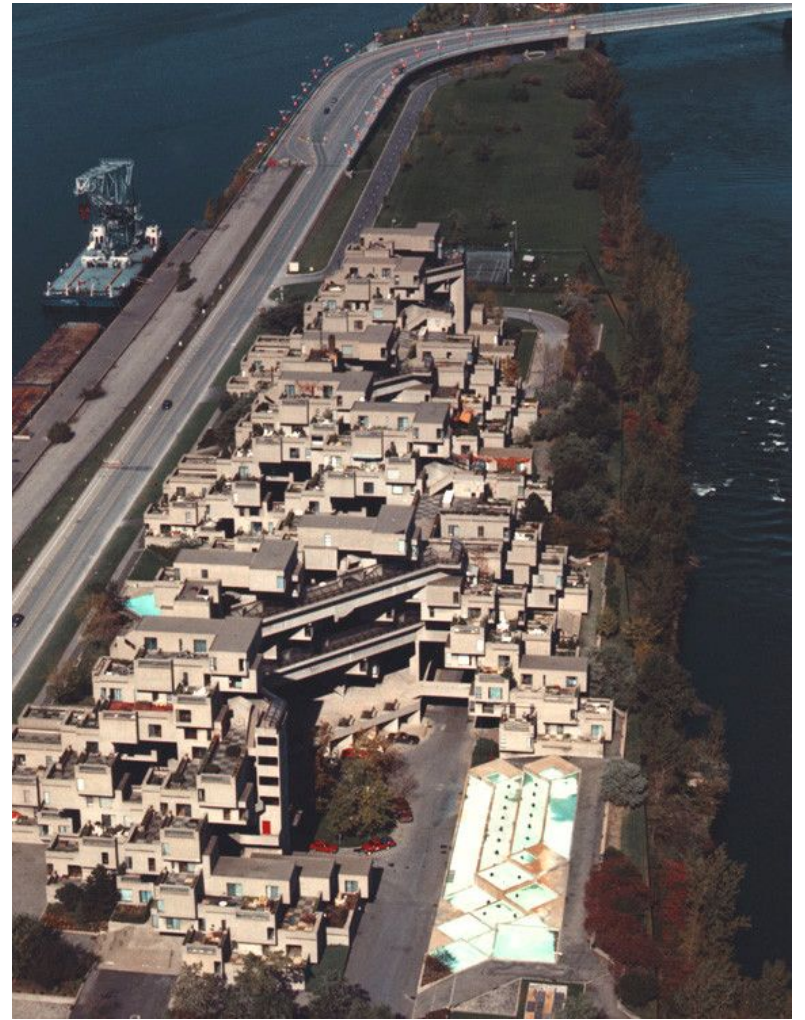
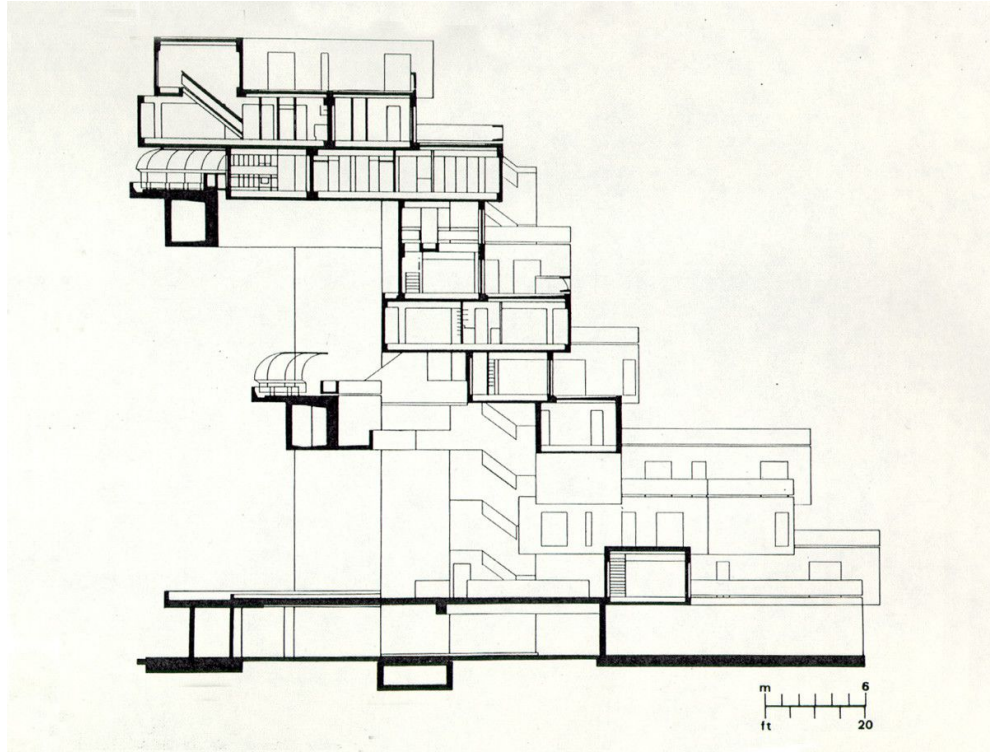


Section-Circulation diagram





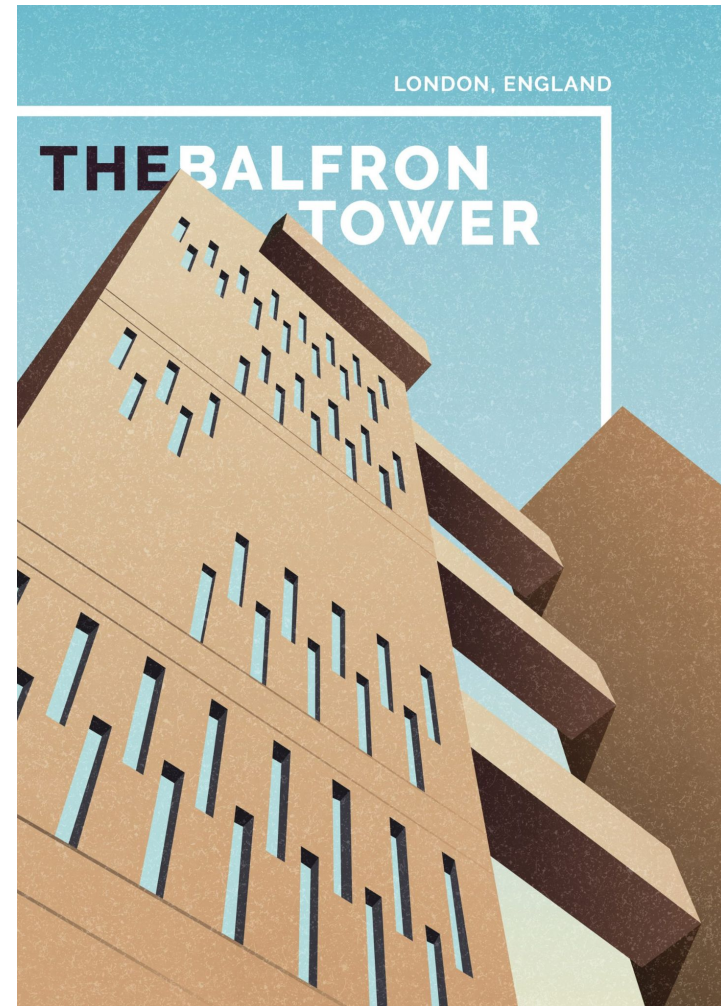
Qualities of suburban life in a densely populated environment:
Private garden
Fresh air
multiple exposures



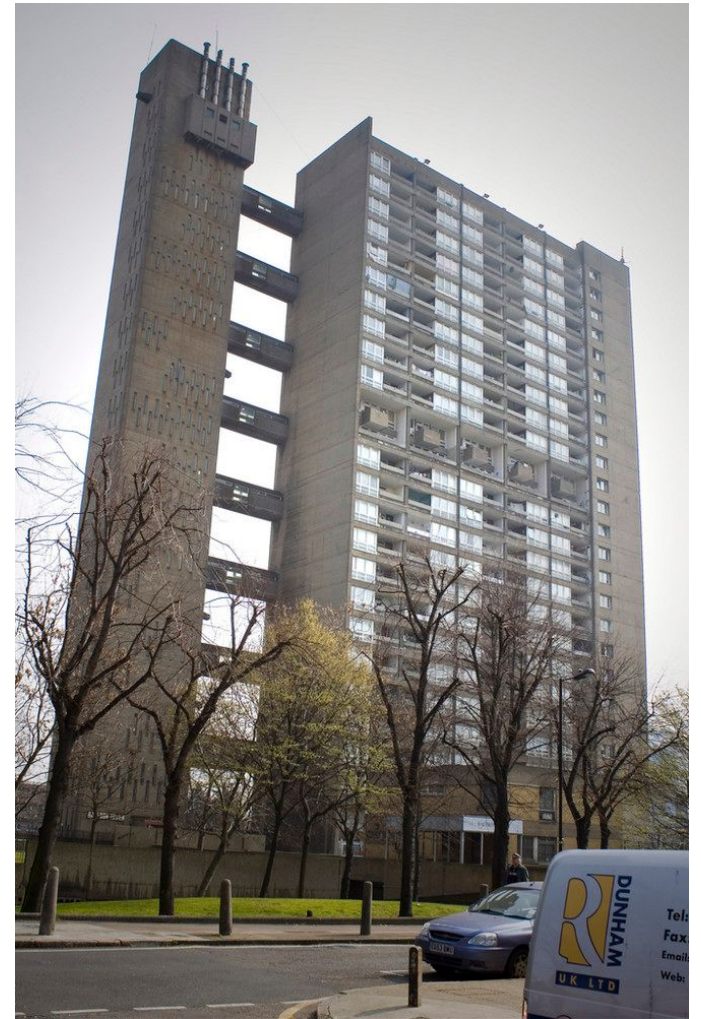
The Balfron Tower by architect Erno Goldfinger is an iconic Brutalist residential high rise located in London.

Designed in 1963 for the London County Council and completed in 1967 by the Greater London Council, this social housing estate broke the traditions of typical residential architecture.

Conceived as a solution to sprawling suburbia, Goldfinger embraced verticality as the cure.



Rising to 84 meters in height. In a drastic shift from the typical preconception of tower architecture, Goldfinger separated the services from the accommodation by splitting the tower in two. Entry is gained via a concrete bridge that opens into the main lobby of the slender service tower.



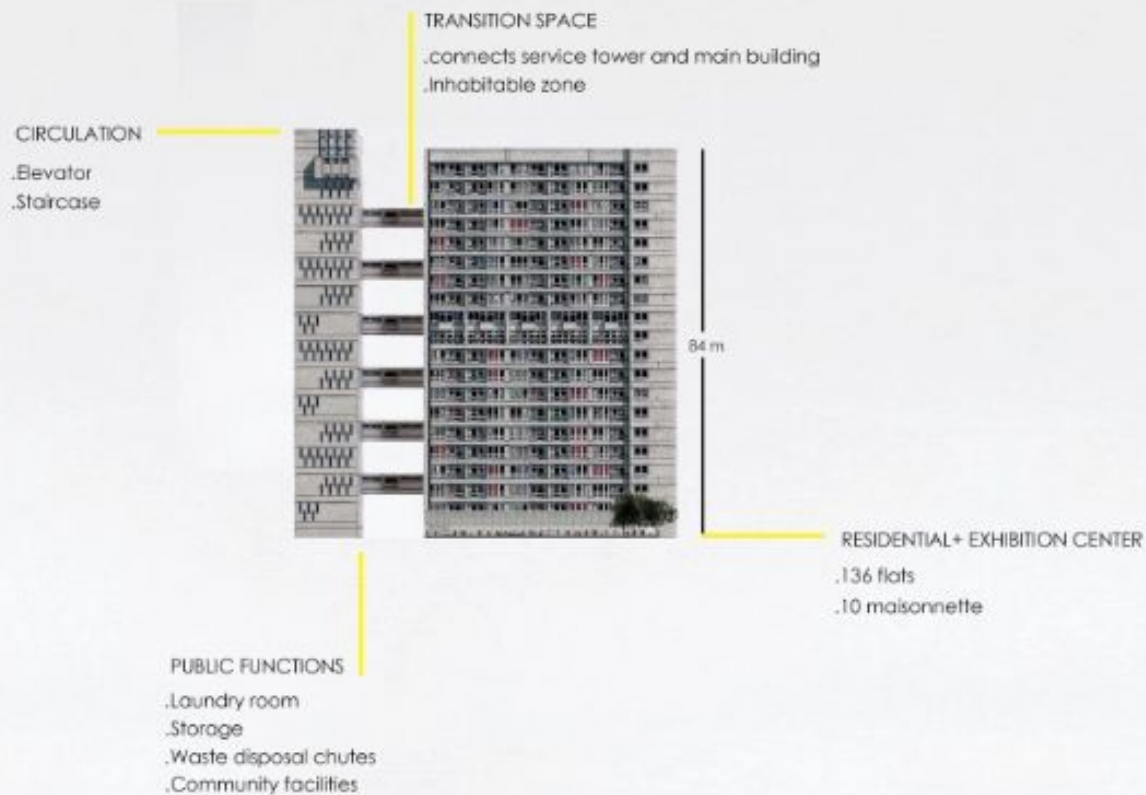
One of the most unique design choices made by Goldfinger was the layout of the residential portion of the tower. Consisting of 136 flats and 10 maisonettes, the main entries to the flats are located on every third floor, which are connected to the service tower by bridges.

Once inside the flat, an internal stairway directs occupants up or down into the next volume of the flat. This decision opened up the floors above and below the public corridors to run the full width of the building. In order to determine the successfulness of his unconventional design, Goldfinger moved into unit 130 for two months in 1968, where he hosted numerous parties for fellow residents.

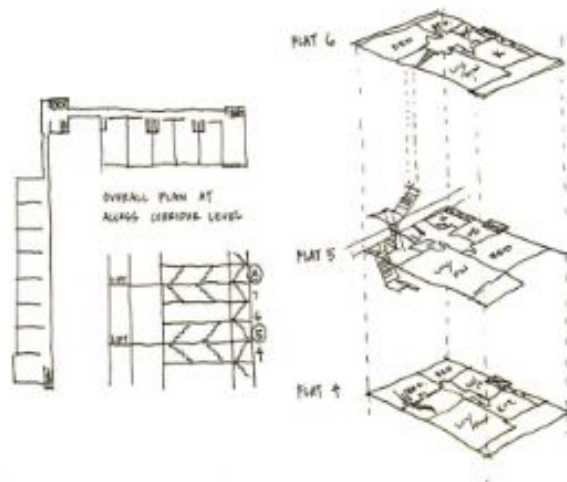
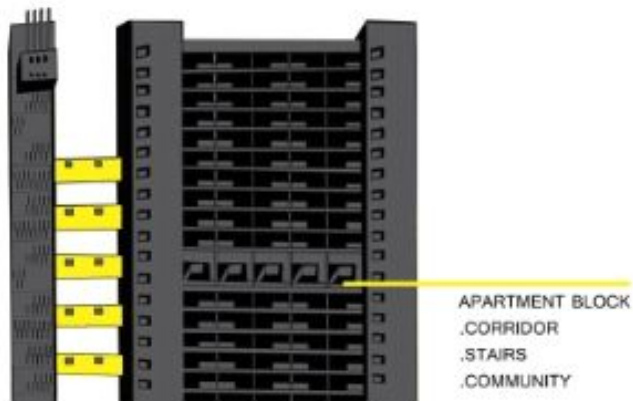
A *maisonette* is a two-storey flat, where your front door is your own. This means that you can exit your home directly to the outside



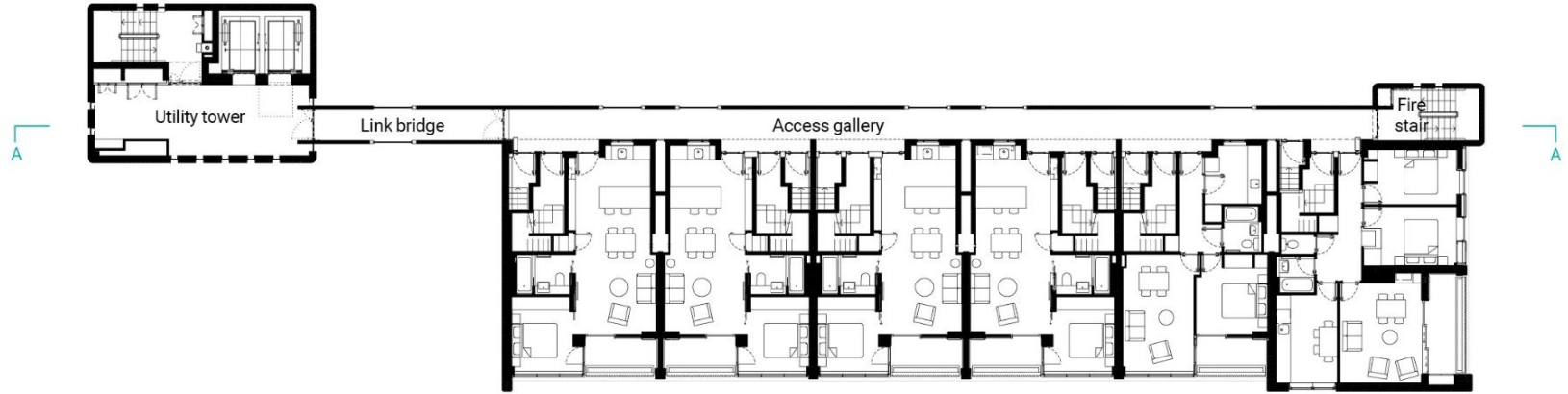
BALFRON TOWER (Precedent of Koç Towers)



CIRCULATION AND ACCESSIBILITY



Typical floor plan



0 2m

Typical flat layouts



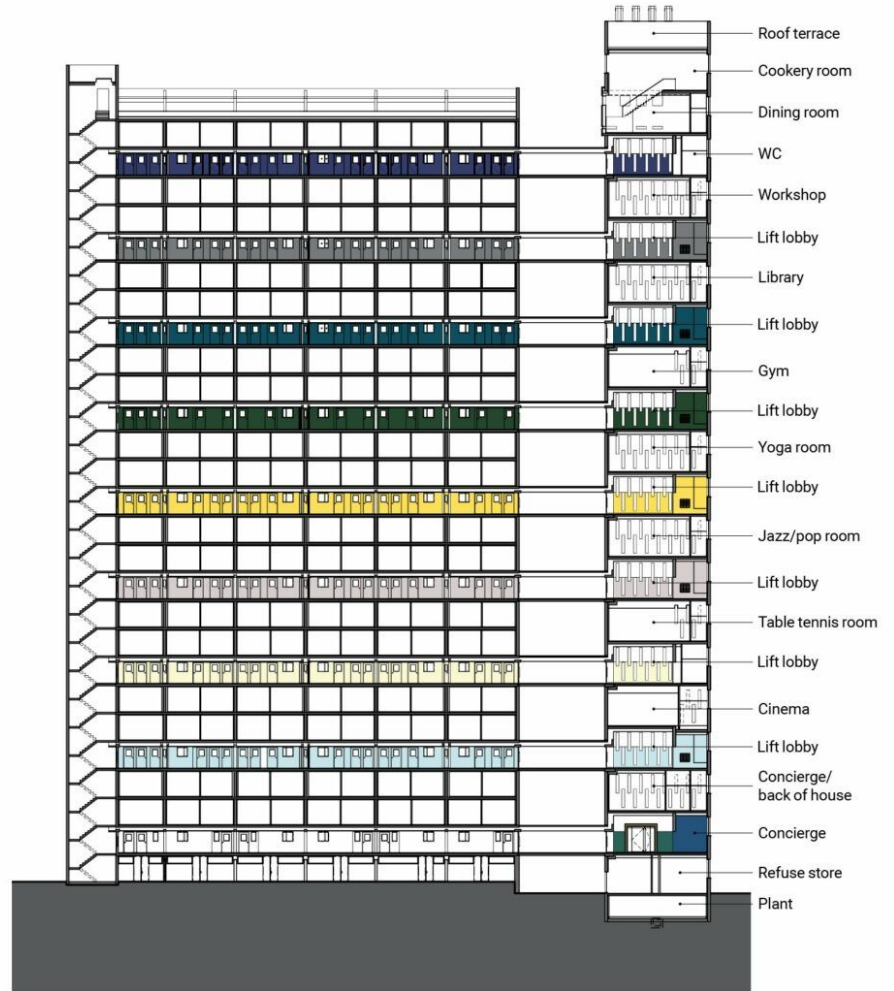
'Heritage' plan

Studio Egret West plan

Ab Rogers Design plan



Section A-A

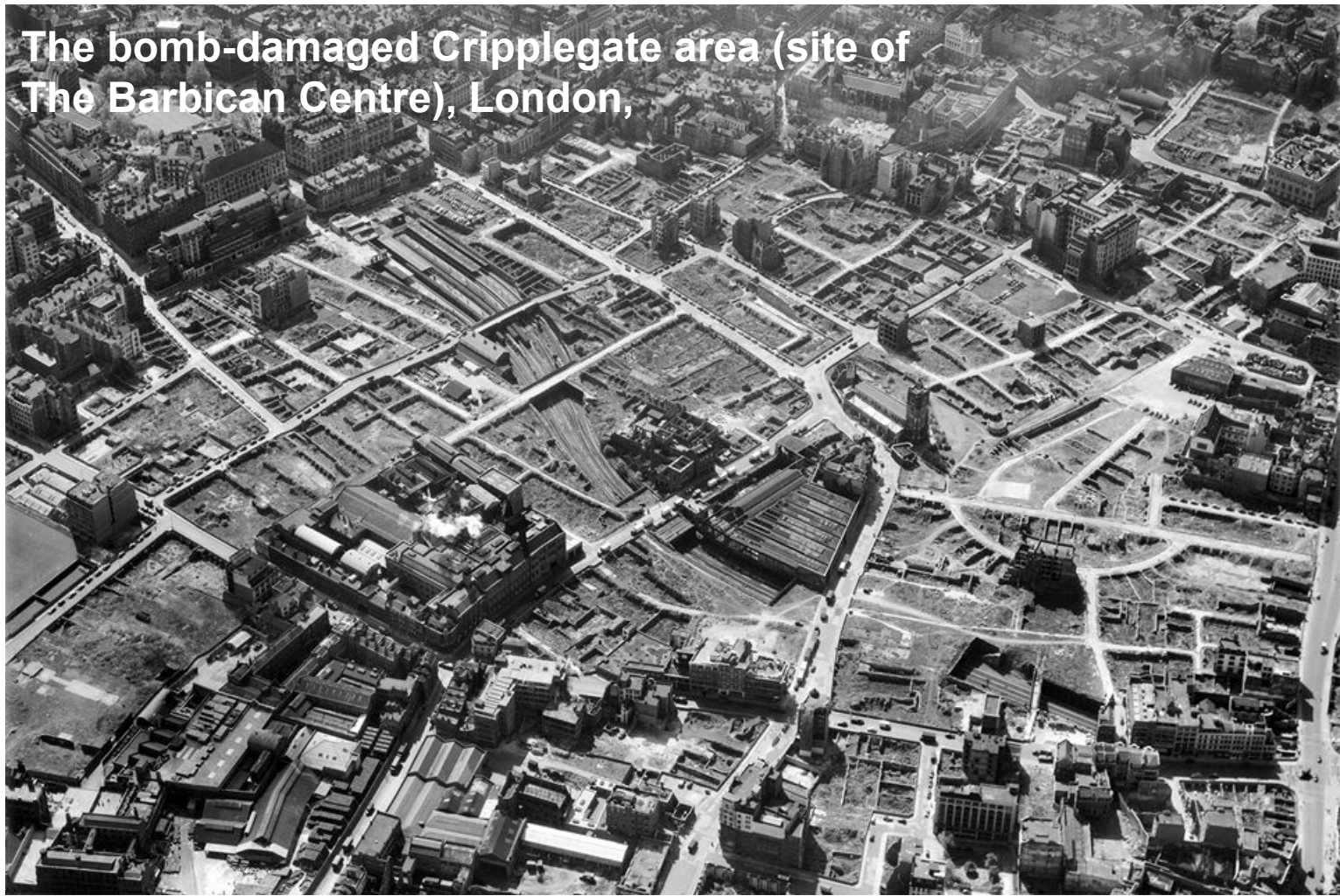




On the 29th December, 1940, at the height of the Second World War, an air raid by the Luftwaffe razed a 35-acre site in the heart of the City of London to the ground. The site was known as the Barbican (a Middle English word meaning fortification), so-called for the Roman wall which once stood in the area. Following the war, the City of London Corporation—the municipal governing body for the area—started to explore possibilities to bring this historic site into the twentieth century.



The bomb-damaged Cripplegate area (site of The Barbican Centre), London,





Chamberlin, Powell and Bon

1950

The Barbican's location in the financial center of the British capital made it attractive to commercial developers and, as a result, several office schemes were proposed. These were rejected by the Corporation, partly due to the area's dwindling population.

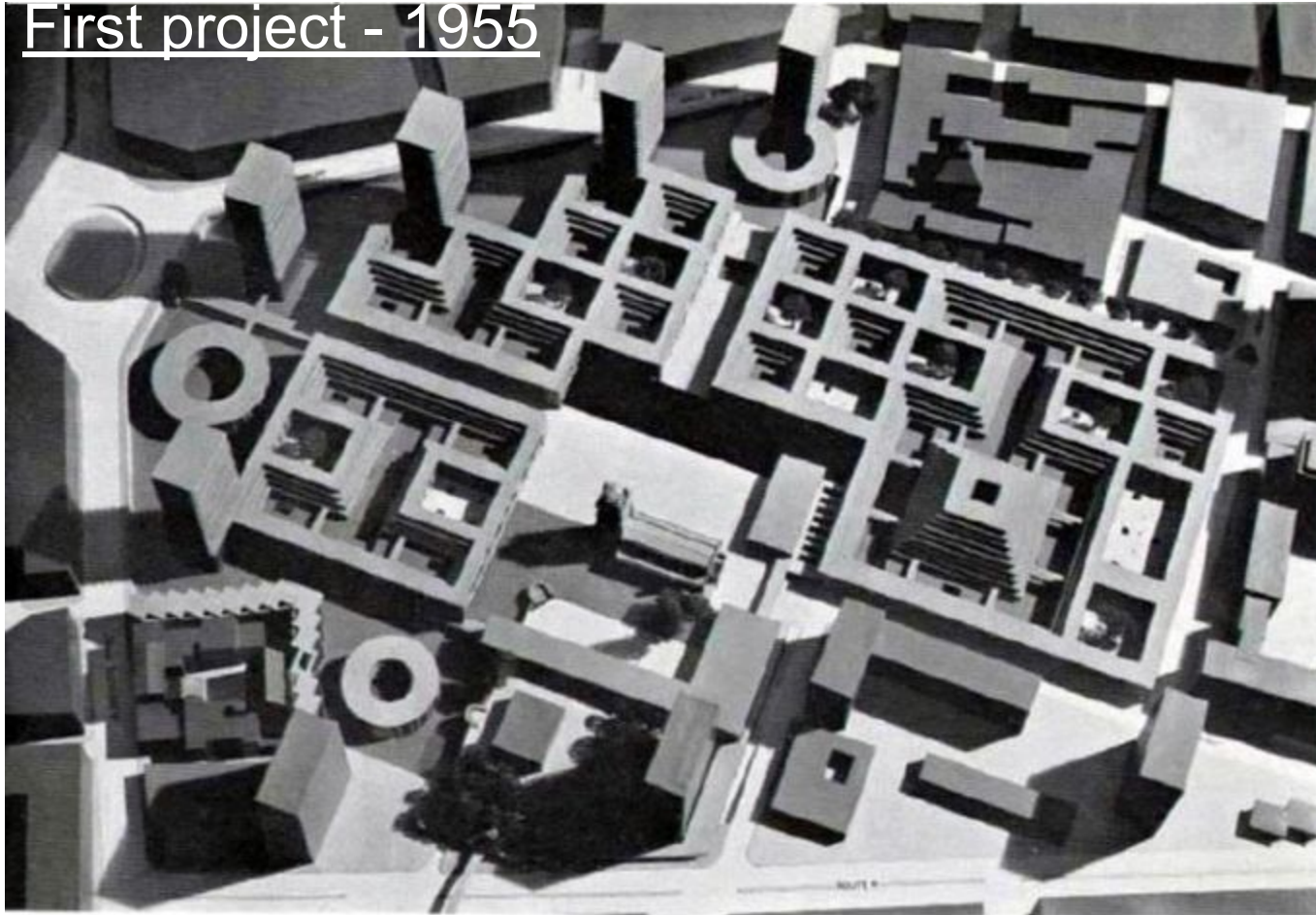
As the area had become increasingly commercialized, **the number of residents had plummeted from 100,000 in 1851 to just over 5,000 in 1951.**

With such a small electorate, the City of London was at risk of losing its Member of Parliament (MP) and, as a result, its political clout. A housing scheme put forward by Chamberlin, Powell and Bon in 1955 offered an opportunity to reverse the population decline by enticing new residents into this void in the City.



Chamberlin, Powell and Bon

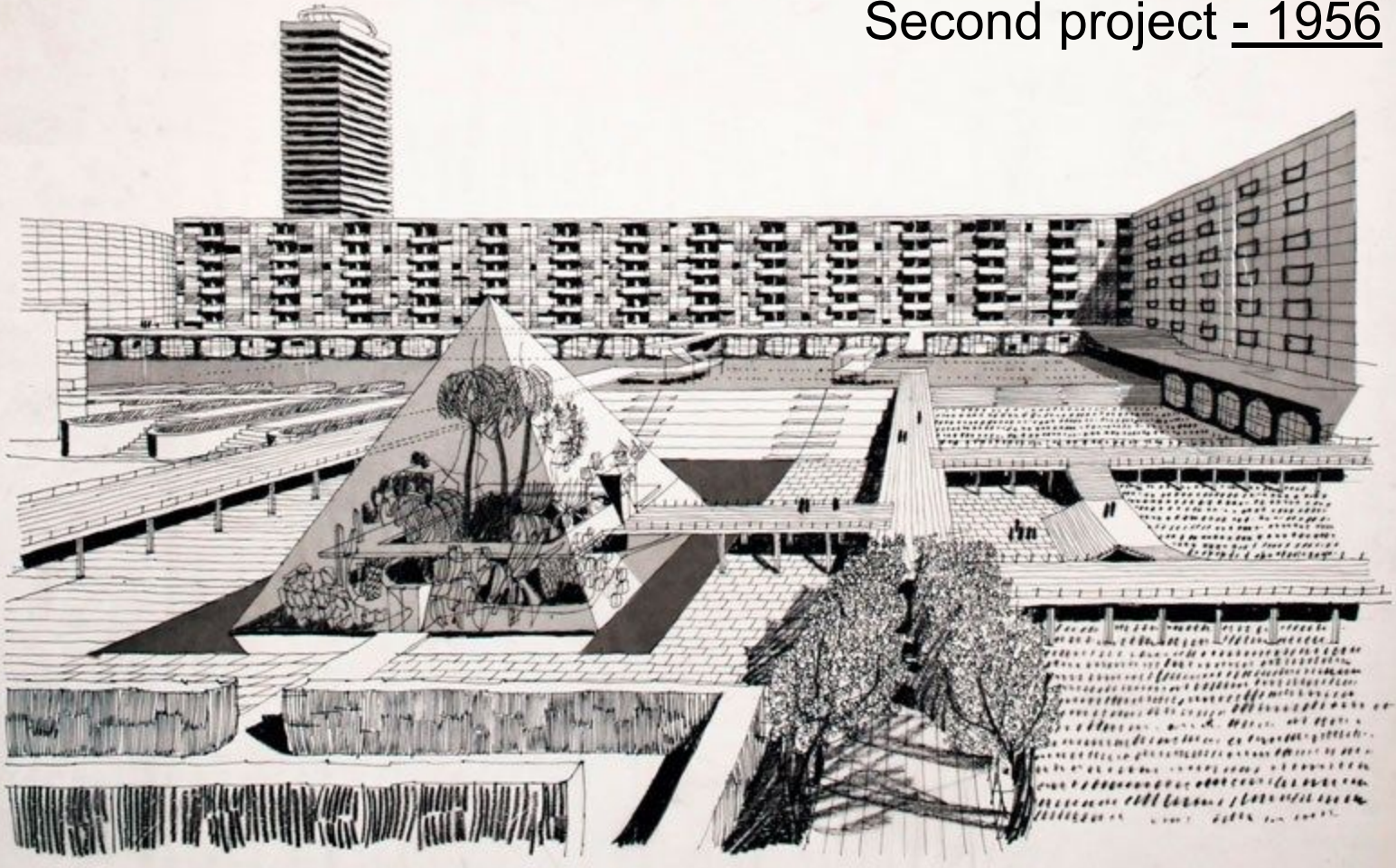
First project - 1955



4 office towers;
system of private
& public courts
centered upon a
square around
the church;
circular motive –
modern urban
living

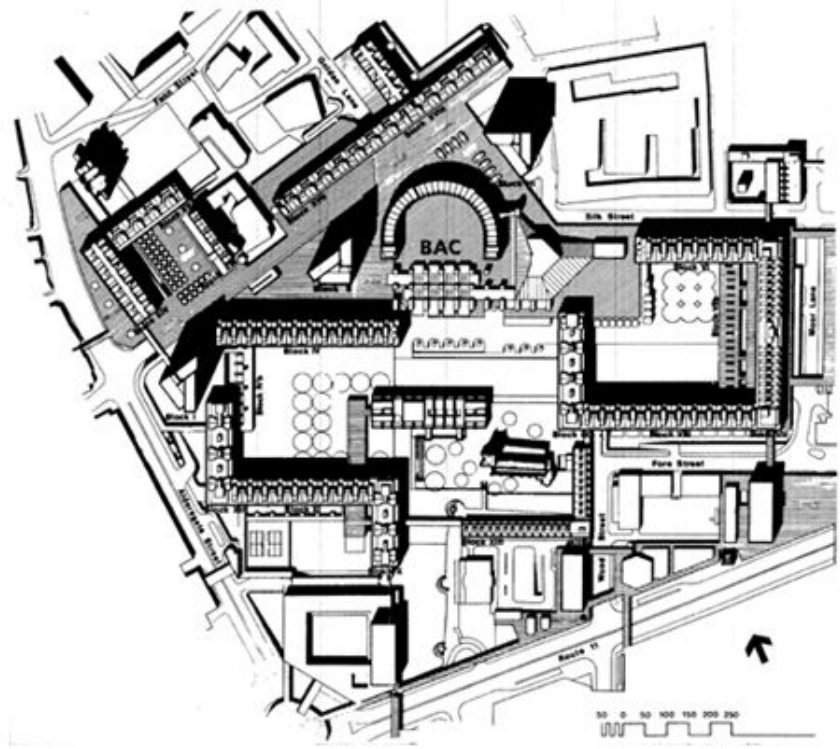
The City asked the architects to design residential accommodation to meet “a demand among middle and higher income groups employed in the City”.

Second project - 1956

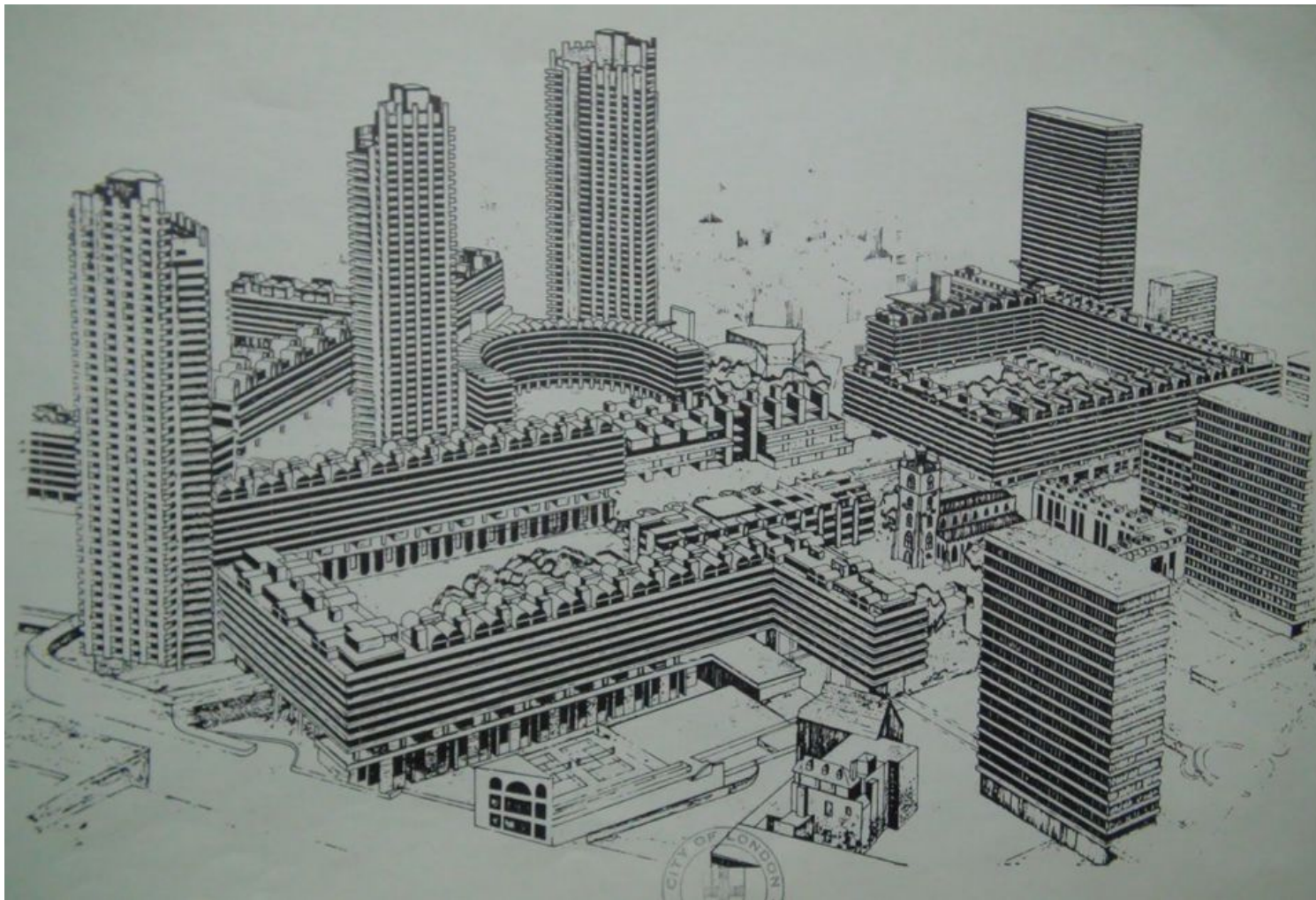


Towers now residential, including three schools (more need for open space), an arts center and a hotel

1959 Final plan

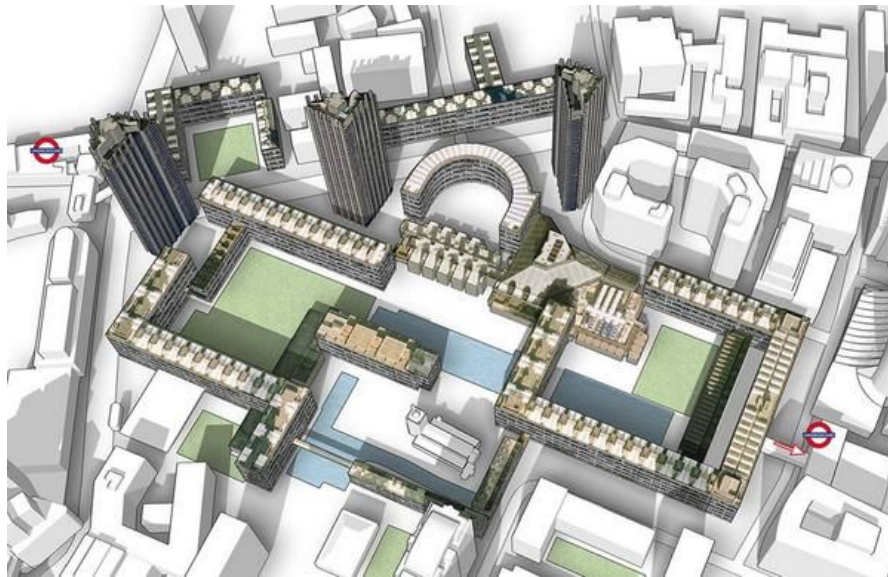
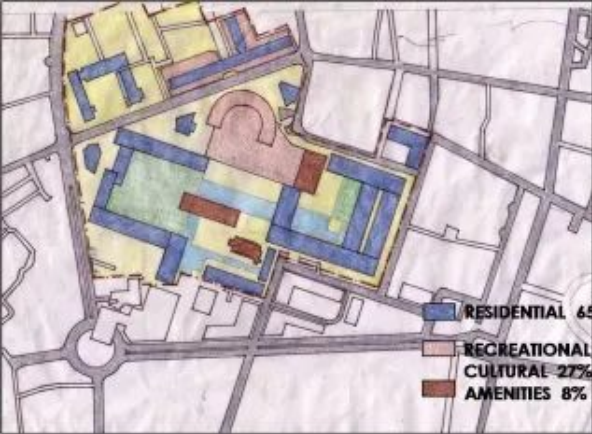


Towers now triangular, crescent building included, large green spaces, pedestrian deck (in gray) with parking and circulation underneath, N-S street / viaduct proposed and afterwards removed



In addition to “luxury” housing, Chamberlin, Powell and Bon’s masterplan for the Barbican featured cultural facilities (including a concert hall and theater), a shopping mall, underground parking, private gardens, and lakes with fountains and a waterfall.





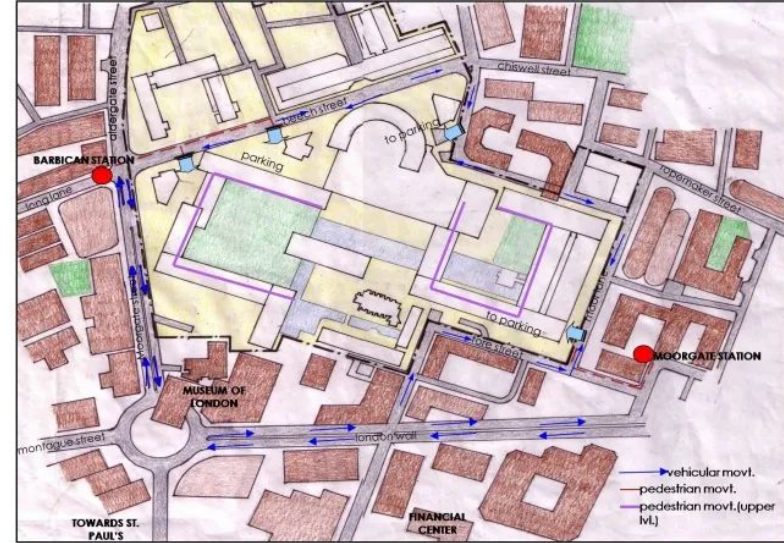
- 2113 dwellings (studios, apartments, maisonnettes, houses)
- 2500 parking spaces
- 2 schools
- Theatre
- Concert hall
- Art gallery
- Library
- Youth hostel
- Shops
- Swimming pool
- Gym

Various building types interconnected



Barbican is criticized because

- Difficult to navigate
- Deck isolates the Barbican from the surrounding urban tissue
- Arts centre / theatre / concert hall has no 'face' and is difficult to find
- Estate is introvert and by now totally gentrified



https://www.youtube.com/watch?v=RncC8_DQGMk

Metabolism

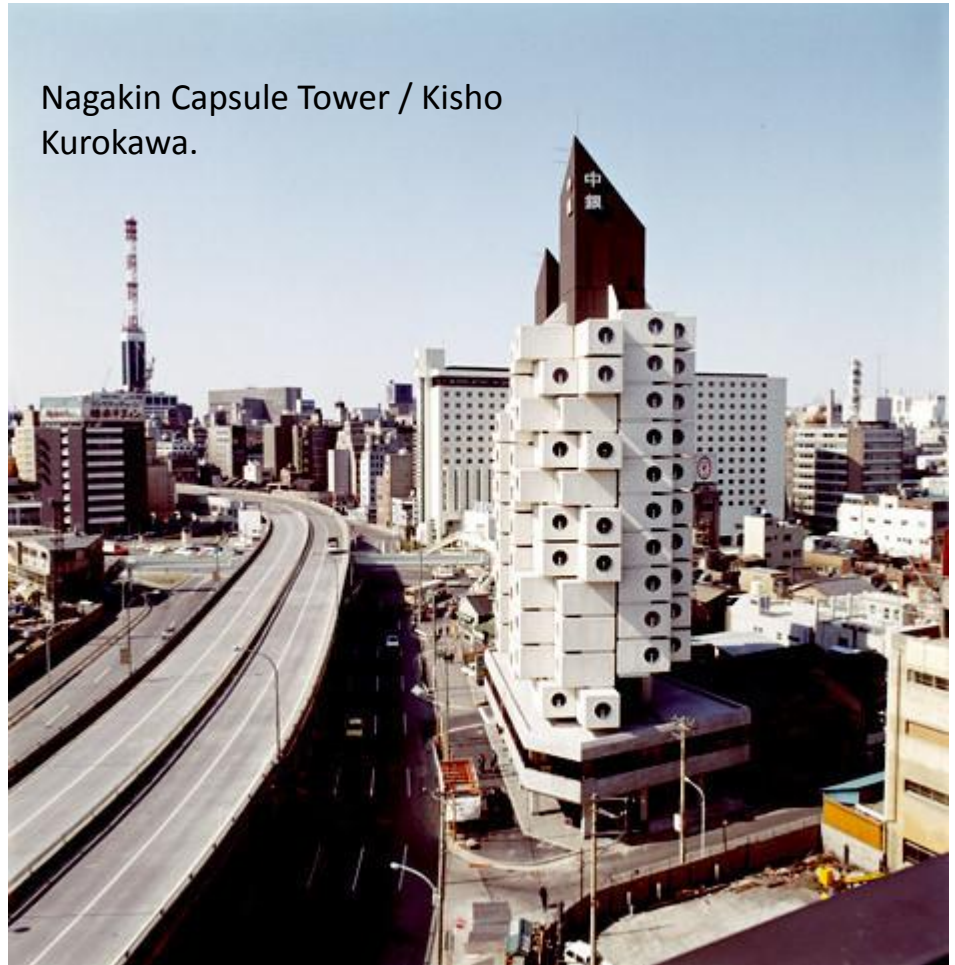
Metabolism

Metabolism was a Japanese movement that infused megastructures with organic biological growth.

a group of young designers including Kiyonori Kikutake, Kisho Kurokawa and Fumihiko Maki published their Metabolism manifesto in 1960, giving the style significant public attention.

Characteristics include modularity, prefabrication, adaptability, and strong core infrastructures.

Nagakin Capsule Tower / Kisho Kurokawa.



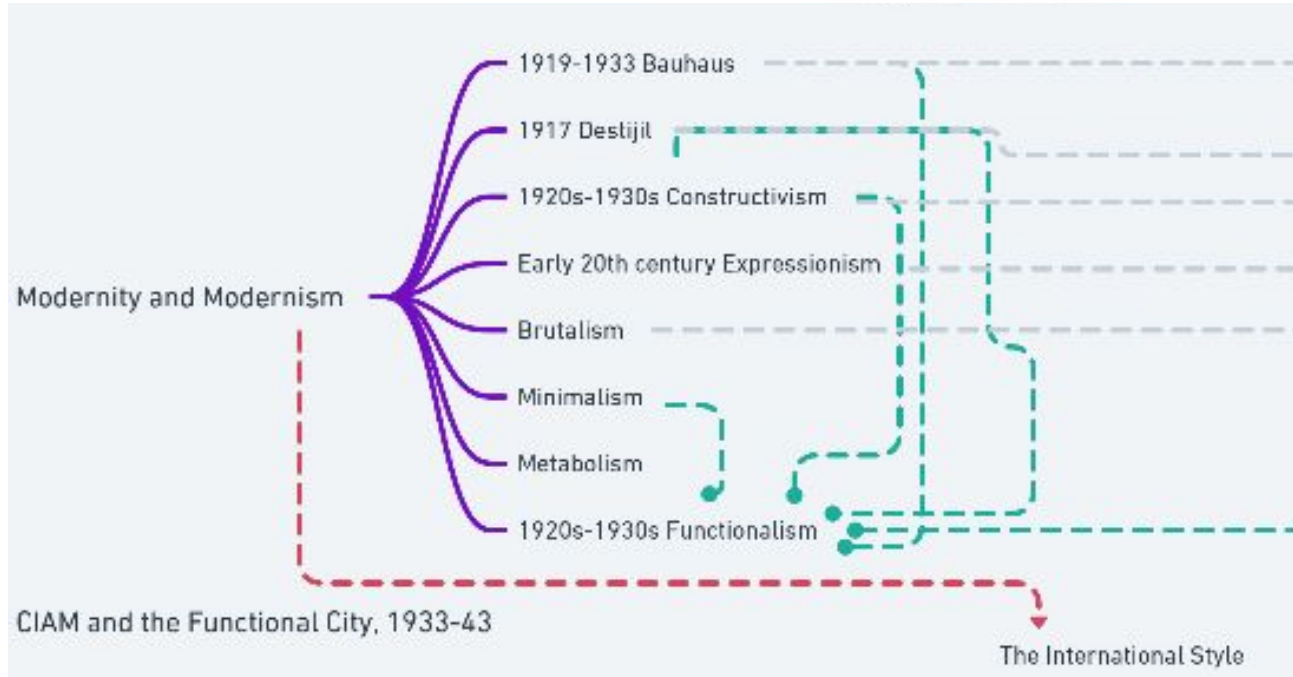
Architect Kisho Kurokawa was very innovative in his creation of the **Nakagin Capsule Tower** in 1972, which was the first capsule architecture design. The module was created with the intention of housing traveling businessmen that worked in central Tokyo during the week.

It is a prototype for architecture of sustainability and recycleability, as each module can be plugged in to the central core and replaced or exchanged when necessary.



https://www.youtube.com/watch?v=p_Bd99rscmM

International Style



What is the International Style? 1920s- 1970

In architecture, the term "International Style" describes a type of design that developed mainly in Germany, Holland and France, during the 1920s, before spreading to America in the 1930s, where it became the dominant tendency in American architecture during the middle decades of the 20th century.

Origins and Development

The International Style emerged largely as a result of four factors that confronted architects at the beginning of the 20th century:

- (1) Increasing dissatisfaction with building designs that incorporated a mixture of decorative features from different architectural periods**, especially where the resulting design bore little or no relation to the function of the building;
- (2) The need to build large numbers of commercial and civic buildings that served a rapidly industrializing society.**
- (3) The successful development of new construction techniques involving the use of steel, reinforced concrete, and glass**
- (4) A strong desire to create a "modern" style of architecture for "modern man". This underlined the need for a neutral, functional style, without any of the decorative features of (say) Romanesque, Gothic, or Renaissance architecture, all of which were old-fashioned, if not obsolete.**

Characteristics

The typical characteristics of International Style buildings include :

1. rectilinear forms مستقيم
2. plane surfaces that are completely devoid of applied ornamentation
3. and open, even fluid, interior spaces.
4. This early form of minimalism had a distinctively "modern look", reinforced by its use of modern materials, including glass for the facade, steel for exterior support, and concrete for interior supports and floors.