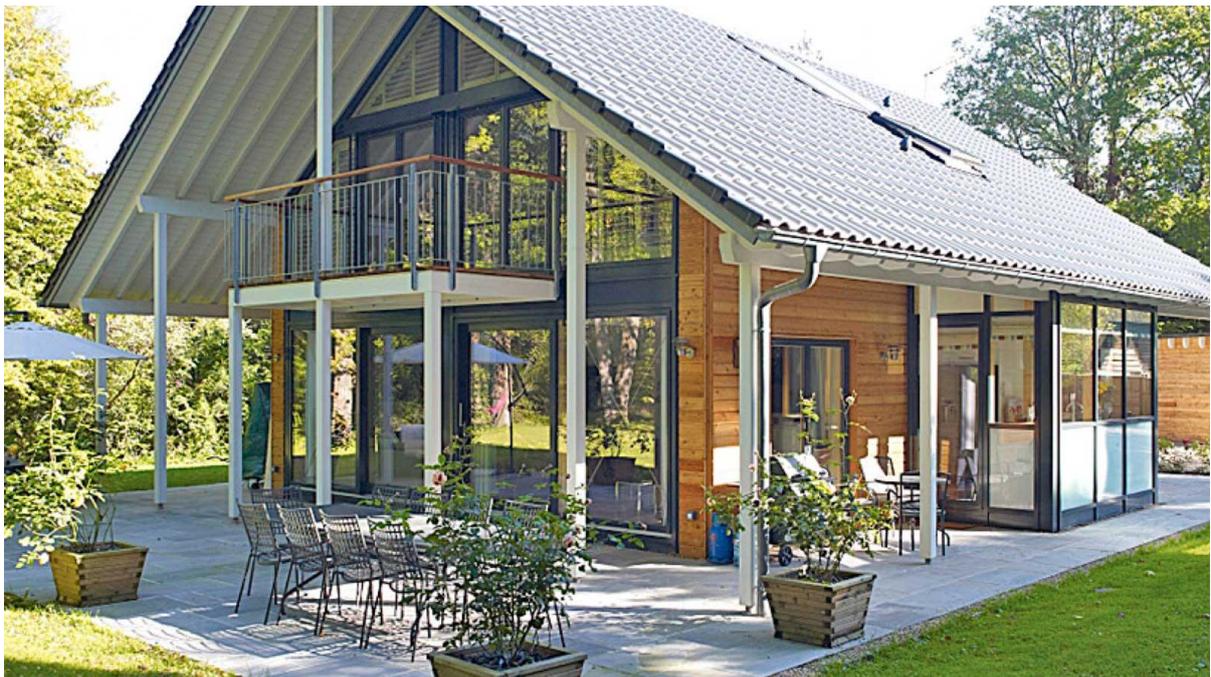


# RESIDENTIAL BUILDINGS

## FAMILY HOUSES & APARTMENT HOUSES

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## **INTRODUCTION**

### **What is a building?**

A building is a structure with a roof and walls standing more or less permanently in one place, such as a house or factory. Buildings come in a variety of sizes, shapes, and functions, and have been adapted throughout history for a wide number of factors, from building materials available, to weather conditions, land prices, ground conditions, specific uses, and aesthetic reasons

Buildings serve several societal needs primary as:

- Shelter from weather.
- Security
- Living space
- Privacy
- Storage or Space to store belongings.
- Comfortably living & work.

A building represents a physical division of the human habitat/shelter living inside and outside. Inside, (a place of comfort and safety) & the Outside, (a place that at times may be harsh and harmful).

Over the years there has been a tremendous development in various types/categories of buildings. One of the most important and widely used is the Residential Buildings. We would study this type in detail.

### **What is a Residence?**

A residence is a place, normally a building / a structure, used as a home or dwelling. Today a residence is place of identity & security for everybody. It is their most prime possession. In different parts of the world, residence has the same importance for people in different countries, religion, caste, etc. Architecture has given residence a different meaning today, as there has been development in different types of residential buildings/houses. Now the time has come, where a person can choose his type of residence according to his requirements, choice & affordability and experience its living.

### **Residential Building**

A residential building is defined as the building which provides more than half of its floor area for the purpose of a dwelling / a house. In other words, residential building provides sleeping accommodation with or without cooking or dining facilities.

These are divided commonly in two types:

- 1) **Family houses**
- 2) **Apartment house**

Family house and Apartment houses have the same concept, use and purpose but the only difference is the planning and facilities provided in both the situations. Family house is usually referred for a single family house living on an individual plot. The term Apartment house is preferred for the large number of flats grouped together on a single plot sharing common services, having large number floors. These can be widely seen now, presently construction of high rising apartments is on a rise and architects are using innovative concepts which could make it affordable, unique, user friendly, and a habitable space for its users.

While deciding on the type of house you'd like to choose, it's important to know what's available around you and also envision your needs & lifestyle, which might evolve for the next coming years (5-10 years).

## **Types of Residential Buildings**

These buildings can be classified differently, based on their design and use. But somewhere there concepts are related / similar with each other, which function differently in each typology.

### **Single-Family Home**

**Design Principle:** Single family homes (often abbreviated as SFH) are homes built on a single plot, with no shared walls. Sometimes there's a garage, attached or detached. These buildings are most often called as houses or homes.

#### **Benefits**

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- They have complete privacy and no sharing of space
- Offer more space than other types of homes.
- Usually comes with a private front and back yards.
- Any type of home design can be chosen.
- Has a more reliable resell value than condominiums and townhomes.

#### **Drawbacks**

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- It generally requires a lot of maintenance compared to the other shared houses.
- All of the cost for that falls on the shoulders of the homeowner.
- With condos and townhomes, you share the costs involved with yard maintenance, plumbing, roofing and building amenities.

-Security measures have to be taken care by yourself.

### Characteristics

-No. of stories / floor: 1-2

-No. of dwelling units: 1

-No. of owners: 1

-Doorways/ Entries: Individual access to the unit

-Parking: Private located inside the plot

- Open space: Individual Yard

-Housing Variants: Stand alone structure

-Potential Neighborhood: Residential

-Shared spaces: No

-Common walls: No



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## **Multi-Family Home**

**Design Principle:** Multi-family homes are the least common type of residential building. They are essentially a home that has been turned into two or more units. They can be row house-style or have multiple floors, and range in size from a duplex to a four-plex. Anything more than four units are considered commercial. Houses may also be built in pairs (semi-detached), in terraces where all but two of the houses have others either side. The houses may be built round courtyards or as rectangular blocks surrounded by a piece of ground of varying sizes.

Some multi-family homes have a separate entrance for each unit, while some share the main entrance. The multi-family units can't be purchased individually as there's one owner for the whole building / block.

### **Benefits**

- Multi-family homes are ideal for those looking for an investment property.
- Many live in one unit, and rent out the others for income.
- You can simply rent out all units.
- They are also a great option for multi-generational households, they allow family members to live in the same building but have their own unit.
- If you rent one unit, the maintenance cost goes to the landlord.

### **Drawbacks**

- Multi-family units are a hybrid between a single-family home and a condo.
- The units tend to be smaller than single-family homes.

They have less privacy.

- If you are the owner you have to bear all the costs for maintenance individually plus, the time commitment of finding renters.

## Characteristics:

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- No. of stories / floor: 1-3
- No. of dwelling units: 5-25 or more
- No. of owners: Single & Multiple
- Doorways/ Entries: Individual or shared access to the unit
- Parking: Private or located outside the plot
- Open space: Individual Yard for some units / shared/not available
- Housing Variants: single structures grouped together
- Potential Neighborhood: Suburban Residential / row house
- Shared spaces: Yes
- Common walls: Yes, usually in most of the cases.



## **Apartment / Condominium**

**Design Principle:** Condominiums (or condos for short) are single units within a larger building or community. Condos share a wall or two with other units, and generally come with homeowners' associations (HOAs), which require the residents to pay monthly or yearly dues. They are popular in urban, high-density, commercial areas, where there are many restaurants and shops, offices, etc.

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Residential buildings containing more than one dwelling unit are called an apartment building. A condominium is an apartment that the occupant owns rather than rents. Increasing settlement density in buildings is usually a response to high ground prices resulting from many people wanting to live close to work or similar attractions.

### **Benefits**

- Easy and low cost maintenance.
- Minimum / shared responsibility towards the maintenance and upkeep.
- Use of common areas like gyms, lounge areas, pools and other amenities, which are not easily affordable individually or in a single-family home.
- High Security
- Numerous services
- Accessibility & transport as the location is wisely chosen by the builder.

### **Drawbacks**

- Condo homeowners' associations often limit the types of remodeling you can do.
  - There can be pet and rental restrictions.
  - All the flats of common design and internal layout usually.
  - Home owners association want uniformity and safety, one can't replace doors and windows if they're not to a high standard, or safely installed.
  - Shared space with others, therefore there's not as much of privacy.
  - Need to be extra cautious of disturbing your neighbors because they are so close.
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## Characteristics:

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- No. of stories / floor: 6-20 or even more
- No. of dwelling units: 2-6 on each floor, or even more depends on the layout & scale.
- No. of owners: Multiple
- Doorways/ Entries: Shared access to the unit
- Parking: Shared located inside the plot
- Open space: Shared/not available
- Housing Variants: single /multiple high rise structures grouped together
- Potential Neighborhood: walkable commercial
- Shared spaces: Yes
- Common walls: Yes



## Apartment from Czech Republic:

## **Townhouse**

**Design Principle:** Townhouses are a hybrid between a condo and a single-family home. They are often multiple floors, with one or two shared walls, and some have a small yard space or rooftop deck. They're generally larger than a condo, but smaller than a single-family home.

### **Benefits**

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- Townhomes often have more privacy than a condo might afford.
- Some have home owners association or joint maintenance agreements to share upkeep costs.
- They tend to be more affordable than a single-family home.

### **Drawbacks**

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- Townhomes don't usually have shared amenities or common area like a gym or a pool, party area, club house, etc.
- They are not as private as a single-family home.

### **Characteristics:**

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- No. of stories / floor: 1-6
- No. of dwelling units: 2 on each floor or more
- No. of owners: Multiple
- Doorways/ Entries: Shared access to the unit
- Parking: Shared located inside the plot
- Open space: Shared / usually not available
- Housing Variants: Multiple structures
- Potential Neighborhood: Traditional residential
- Shared spaces: Yes

-Common walls: Yes



## Examples of Townhouse's From Europe.

### Cooperatives

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**Design Principle:** It is usually a building with multiple and adjoining flats, with shared common areas.

Cooperatives, or co-ops, are a slightly different way of holding a title to a shared building. With an apartment, you own the space within your unit, but with a co-op, everyone owns the building together. Because of the shared responsibility, there's often an interview process to become part of the community.

### Benefits

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- Co-op owners usually take on maintenance as a community, so they tend to have lower cost.
- They also tend to be less expensive than comparable condos.

### Drawbacks

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- You share financial responsibility of the whole building with your neighbors, which means if someone stops paying their mortgage on a co-op, the bank can foreclose on the whole building.
  - It can be more difficult to get a loan for a co-op than a condominium.
  - Some banks won't support it, for processing of the loan.
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### **Characteristics:**

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- No. of stories / floor: 1-6 or more
- No. of dwelling units: 2 or more on each floor.
- No. of owners: Multiple
- Doorways/ Entries: Shared access to the unit
- Parking: Shared located inside the plot
- Open space: Shared
- Housing Variants: Multiple structures
- Potential Neighborhood: Traditional residential
- Shared spaces: Yes
- Common walls: Yes



Proposed Cooperative From Zurich, Switzerland.

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## **Mixed use**

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**Principle:** A mixed-use building aims to combine three or more uses into one structure such as residential, hotel, retail, parking, transportation, cultural, and entertainment. Whatever the combination, it brings together several uses within either one building or a small.

## **Benefits**

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- Using more compact areas of land
- Reducing traffic and pollution by allowing residents to use their cars less
- Creating pedestrian-friendly environments thanks to the short distances between living, work, commercial and recreational destinations.

## **Drawbacks**

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- All activities at one place make the place chaotic if not designed properly.
- Commercial and residential activities combined together creates a problem for both users.

## **Characteristics:**

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- No. of stories / floor: 1-6 or more
- No. of dwelling units: 2 or more on each floor.
- No. of owners: Multiple
- Doorways/ Entries: Shared access to the unit
- Parking: Shared located inside and outside the site.
- Open space: Shared
- Housing Variants: Multiple structures
- Potential Neighborhood: commercial/ residential /retail/office
- Shared spaces: Yes
- Common walls: Yes



Examples of Mixed use Buildings from Europe.

## HISTORICAL DEVELOPMENT

The Medieval House in the Early Medieval Period – Noblemen and Women



This medieval cottage from the thirteenth century, has been reconstructed by the Weald and Downland Museum, Sussex, England. It was inhabited by the Lord of the Manor, his family and servants. It has two rooms, one containing the fireplace that would have been the main living area. The other room contains a stone oven.

The house would've been very dark and smoky inside, as there is no chimney and only a small window. The animals were housed in a separate building, probably a wooden shed, and another building would have been used to store crops which were grown on the land around the house.

### The Medieval House in the Later Medieval Period – Noblemen and Women



In the later medieval period the houses of the rich were made out of brick. However, brick was very expensive so many chose to make the half-timbered houses that are now commonly referred to as Tudor houses. Tiles were used on the roofs and some had chimneys and glass in the windows. These houses had two or more floors and the servants slept upstairs.

### The Medieval House in the Early Medieval Period – Peasants

Peasants' houses from this period have not survived because they were made out of sticks, straw and mud. They were one-roomed houses which the family shared with the animals. They made their houses themselves because they could not afford to pay someone to build them. The simplest houses were made out of sticks and straw.



### Later Medieval Period – Peasants

With more money, peasants were able to afford better housing and many now lived in wattle and daub houses. Wattle and Daub houses were taller and wider than the simple stick and straw houses. They also offered better protection from the weather. They were made by first constructing a framework of timber, then filling in the spaces with wattle (woven twigs). Finally, the twigs were daubed with mud which, when dried, made a hard wall.

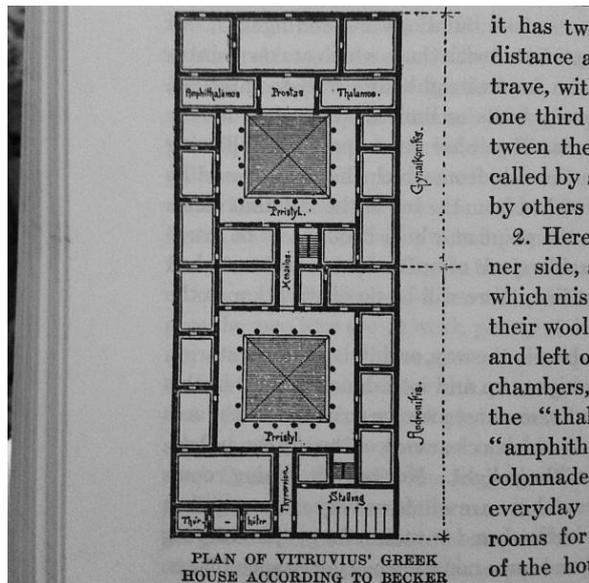
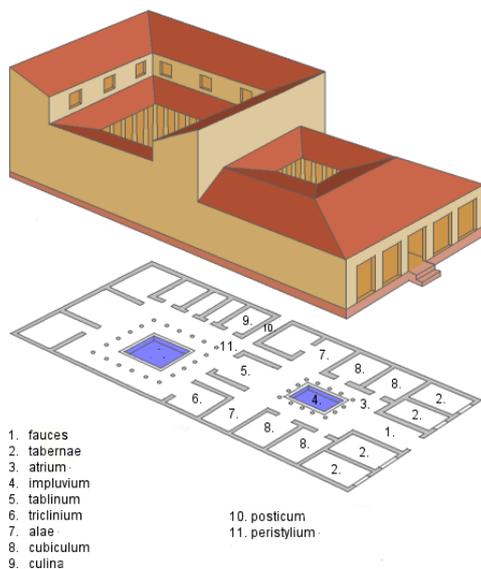


Marcus Vitruvius Pollio (80–70 BC – after c. 15 BC), commonly known as Vitruvius. He was a Roman author, architect, civil engineer, and military engineer during the 1st century BC, known for his multi-volume work entitled *De architectura*.<sup>[1]</sup> His discussion of perfect proportion in architecture and the human body led to the famous Renaissance drawing by Leonardo da Vinci of Vitruvian Man. He invented the idea that all buildings should have three attributes:

- 1) *Firmitas*: Strength
- 2) *Utilitas*: Utility
- 3) *Venustas*: Beauty

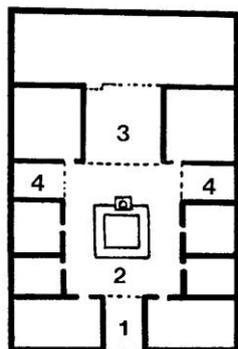
These principles were later adopted by the Romans in the designs. His theories ignited transformation in the designs of residential houses. He designed houses as atrium houses.

Basic principle which he followed & implemented was these were designed without any windows from exterior, to able stand next to another h building. For interior lighting and ventilation, there is an atrium - space without any roof and with column along.

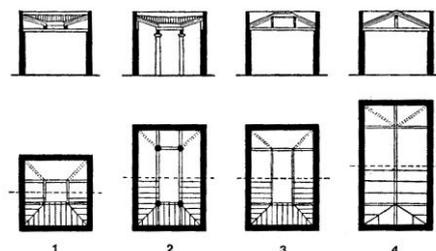


it has two distance a trave, with one third between the called by s by others 2. Here ner side, a which mist their wool- and left of chambers, the "thal "amphitha colonnades everyday rooms for of the hou

PLAN OF VITRUVIUS' GREEK HOUSE ACCORDING TO BECKER



73. Schéma římského atriového domu podle Vitruvia:  
1. vestibul, 2. atrium, 3. tablinum, 4. alae.



72. Typy atriá: 1. tuskánské, 2. čtyřloupové, 3. bezokapové, 4. kryté.

### **Realization:**

Another great designer who had one of the biggest influences on residential architecture & overall living (housing estate, social housing, and minimal houses) is Architect Le Corbusier.

Le Corbusier pioneered the residential architectural style known as Dom-ino. The name, referring to the Latin domus, or house, and the board game dominoes, as the style of pilotis' reflected the game tiles. He advocated: The Pilotis – a grid of columns to replace load-bearing walls, allowing architects to make more use of floor space.

He looked at Reinforced Concrete as an incredible resource and also used it widely in his designs. This led him to his plan for the Dom-ino House (1914–1915). This model proposed an open floor plan consisting of three concrete slabs supported by six thin reinforced concrete columns, with a stairway providing access to each level on one side of the floor plan. The system was originally designed to provide large numbers of temporary residences after World War I, producing only slabs, columns and stairways, and residents could build exterior walls with the materials around the site.

His plans were realized mostly in Europe, because after World war many cities in Europe were destroyed and also after war there was growing population, so there was also the need for new living: mainly flats in housing estates. He designed a series of villas and began to theorize on the use of reinforced concrete as a structural frame, a thoroughly modern technique. Le Corbusier began to envisage buildings designed from these concepts as affordable prefabricated housing that would help rebuild cities, after World War I came to an end.

### **Dom-ino House:**



**An open floor plan modular structure made of Reinforced concrete**

Dedicated to providing better living conditions for the residents of crowded cities, Le Corbusier was influential in planning. He made a lot of realizations but also Ideal plans, of cities - for example also Chandigarh in India, he planed whole city. He wanted to divide cities in 4 parts: housing, traffic, recreation, work.

His one of the known project is in Marseille (France) - Unité d'habitation with mezonet flats. Inspired by the basic concept of his Dom-ino House. Basic concepts implanted in the design:

- No ground floor
- It stands on columns
- Windows running all around the facade,
- No static walls inside, only columns, so the disposition is free and can be divided according to the needs and requirement.



Site Images & Plan: Unité d'habitation with mezonet flats.

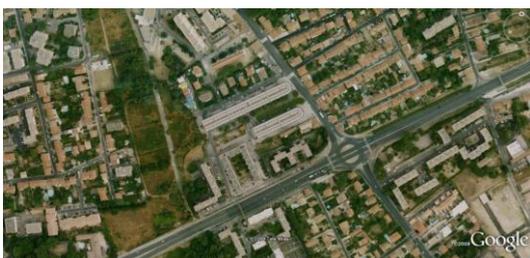
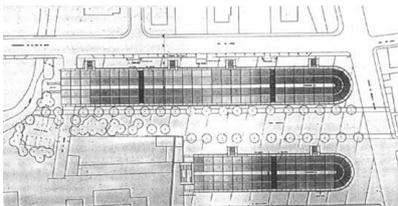
**French Architect Jean Nouvel**, he made a lot of types of housing projects, to name a few of them are:

- 1) Nemausus Housing in France (social housing)
- 2) 11th Avenue New York (Luxury apartments)
- 3) One central park in Australia (flats in condominium - there are shared function of commerce in ground floor and housing in upper floors)

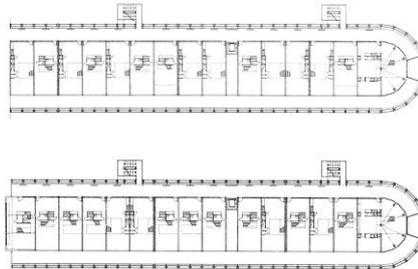
### **Nemausus Housing, Principles & Concepts**



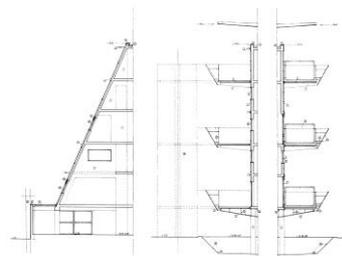
Low cost housing, focusing towards the low income group like students, employees, middle class. Two buildings placed parallel to each other. Elongated boat-shaped, one shorter than the other. Between one half of them projected park and public space that gives ownership to the residents. He preserved two strips of trees that once formed an arboretum, and runs along the entire site. Providing as much light, air flow, which are of prime consideration in an housing especially low cost.



Parking on ground floor with three upper floors. In total there are 114 housing units distributed in the set, with simple types of duplex and triplex (studios, one bedroom house with double height, etc). The total area is habitable 10.400m<sup>2</sup>, so the average of each dwelling is 91m<sup>2</sup> (well beyond the traditional social housing



Building access is via stairs & elevators. Horizontal circulations throughout the length of each building, covering three floors. Passage with a considerable width, to serve as common space for walking, interaction among neighbors and expansion of housing.



At the opposite facade, which faces the street and adjacent buildings, this is repeated a footbridge but in this case is used in private practice for each unit. It is used as a sole or balcony space saved. Towards each side of these passages, the walls are opened outward, expanding the boundaries of each dwelling.



He built more space at the same price, using a straight logic, elementary, and as simple as possible.

## **V Tower, Luxury Apartment, Skyscraper in Prague, Czech Republic.**

It is the highest residential building in the Czech Republic with 104 metres in height and 30 floors. The construction started in 2015 and ended in 2018. It was designed by Czech architect Radan Hubička.

An example of modern Czech architecture, the building is divided into a pair of towers which are to be linked at two-thirds of their height, above which they continue upwards separately. This is allowing for the tower to expand in size as it rises whilst minimizing its ground appropriation, leaving space for terraces around the outside of the building. The larger area towards the top of the towers is where the residential apartments are, resulting in the highest apartments having more space than those which are slightly closer to the bottom of the towers. The building is constructed of glass walls which are designed so that they will reflect light from every angle.



There are 120 flats in total, ranging from smaller studios, to large apartments, and four story penthouses. Amenities like private gardens and recreational swimming pools on the roof of the complex. Additionally, there is a gym, a spa and sauna, and a swimming pool available to all residents between the ground floor and the third level. Tower's parking garages located below complex, with 254 spaces across 3 floors. There are 1-5 bedrooms in each apartment.



V Tower won two awards before the completion. The building received both Best Residential High-rise Architecture Czech Republic and Best Residential High-rise Development Czech Republic in the European category at the International Property Awards in 2015.

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