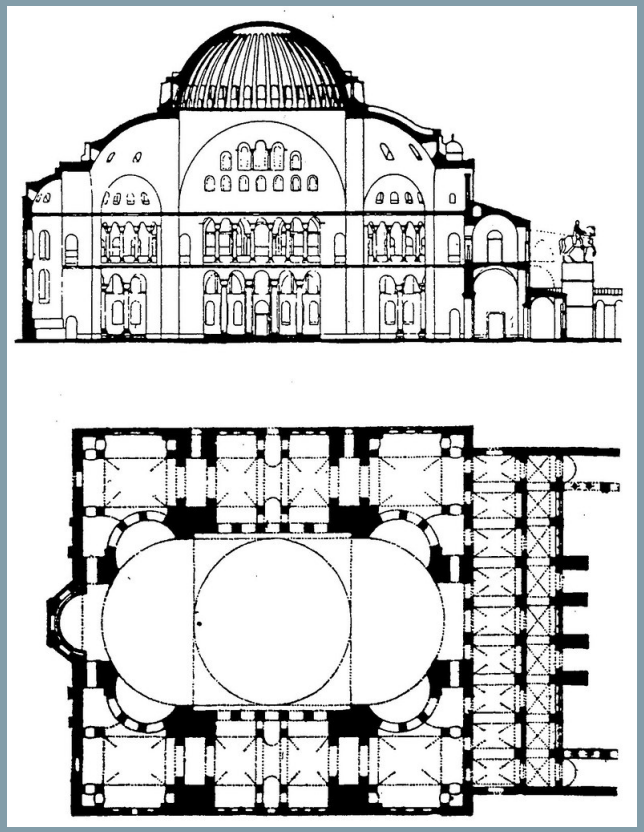
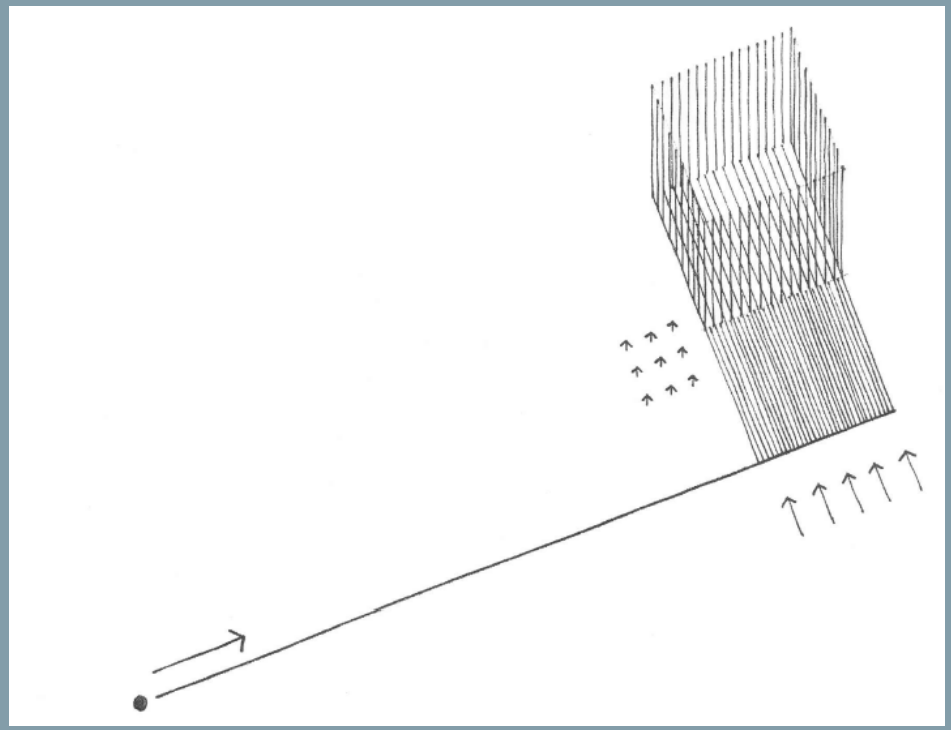
Graphic elements in architecture



Graphic elements in architecture

- Graphic Elements
- From point to line
- From line to plan
- From Plan to Volume

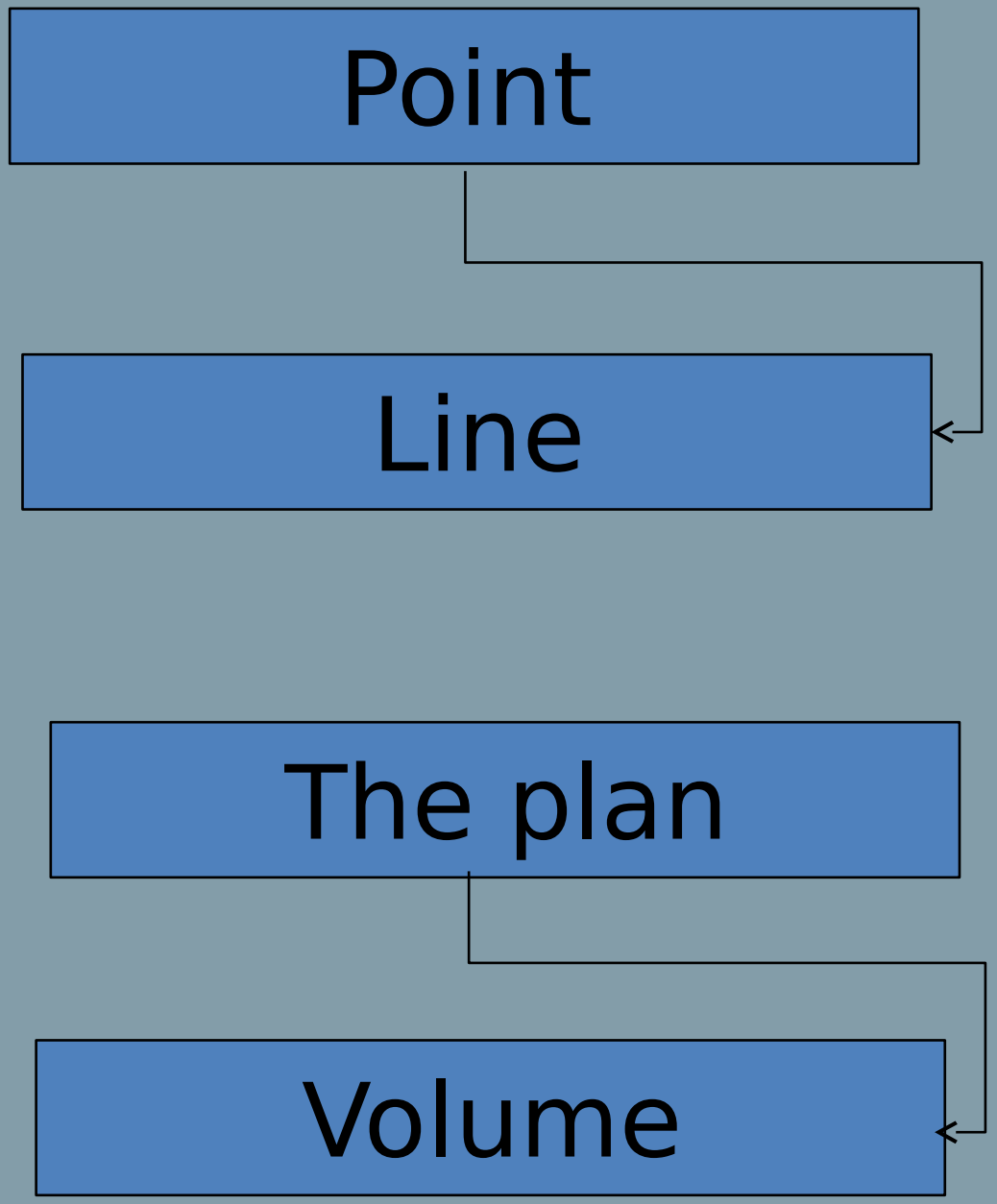


Primary graphic Elements

- The point is the first component of any geometrical element. It has geometrical coordinates (x,y,z)
- A point in motion makes lines. The line is thus the 1st dimension. Lines acquire direction
- Aligned lines each to other give 2-dimensional element. A plan.
- In the movement of planes in space the interaction of planes creates the body or volume.

- Kinetic energy

allows moving the point in line, the line in plane and the plane in spatial dimension.

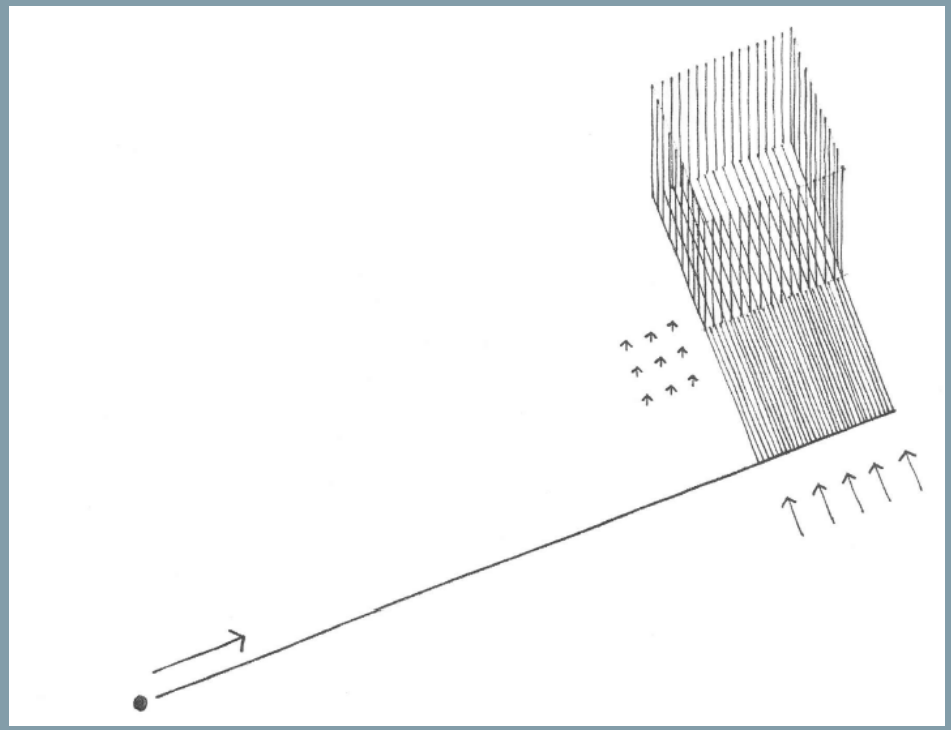


Conceptual Form

- Graphical elements are abstractions :
  They are not visible except in the imagination of the designer .

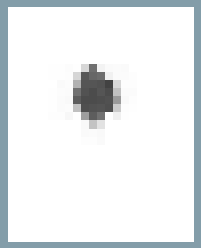
- However we can feel their presence and materialize the:
- We can feel the point at the intersection of 2 lines.
- We can see the line as the outline of a plane.
- Volume as an object that occupies space

- When graphical elements are then materialized, they become form with characteristics of:
- materials ,
- in appearance ,
- dimension , of
- color
- and texture

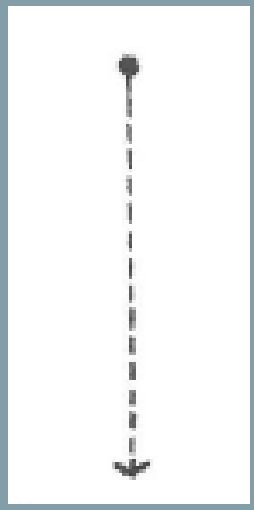


Shape Generation

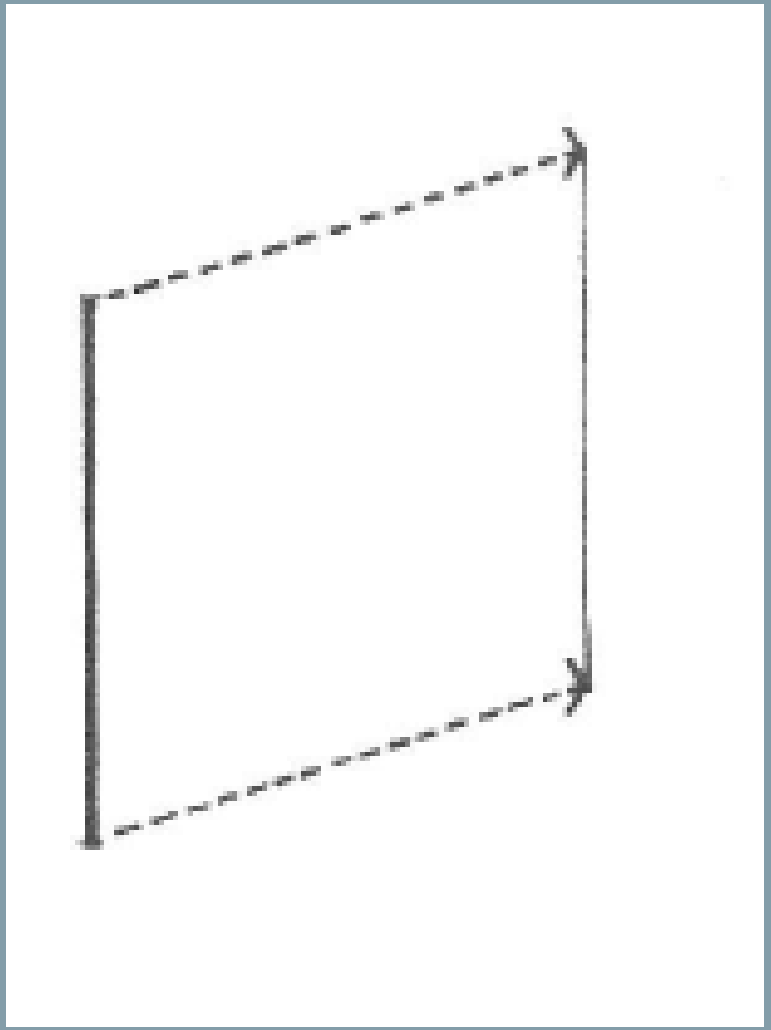
- As the first generator of the form the point indicates:
- Position in space



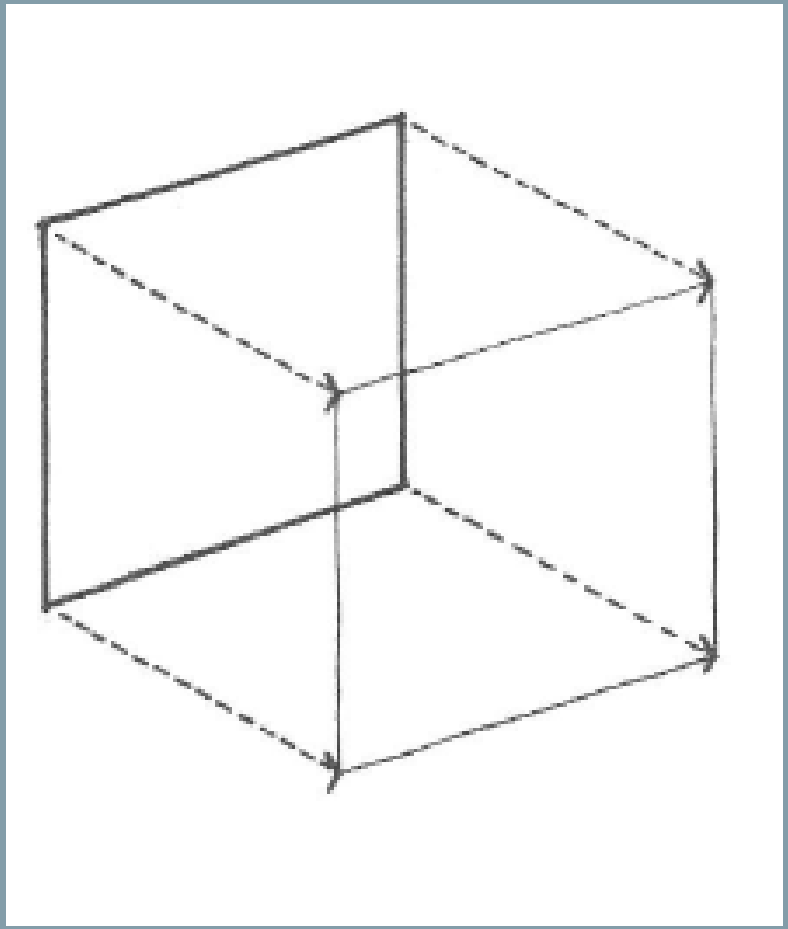
- The extension of the point gives rise to the line with its properties:
- **Length**
- **Direction**
- **Position**



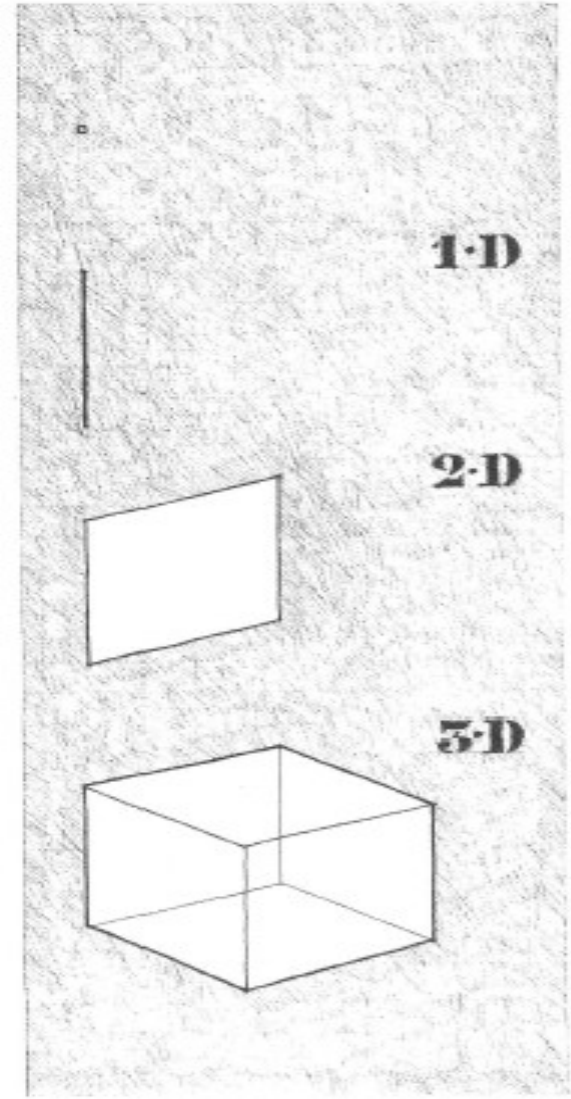
- The extension of the line generates the plane with its properties:
- **Length**
- **Width**
- **Shape**
- **Surface**
- **Position**



- The extension of the plane gives rise to the volume with its properties:
  - **Length**
  - **Width**
  - **Depth**
  - **Shape**
  - **Space**
  - **Surface**
  - **Position**



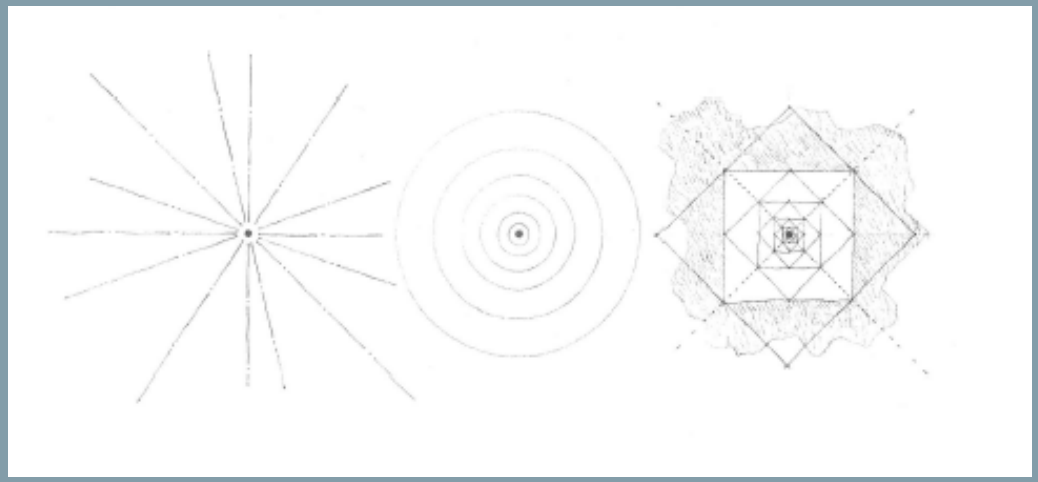
Synthesis



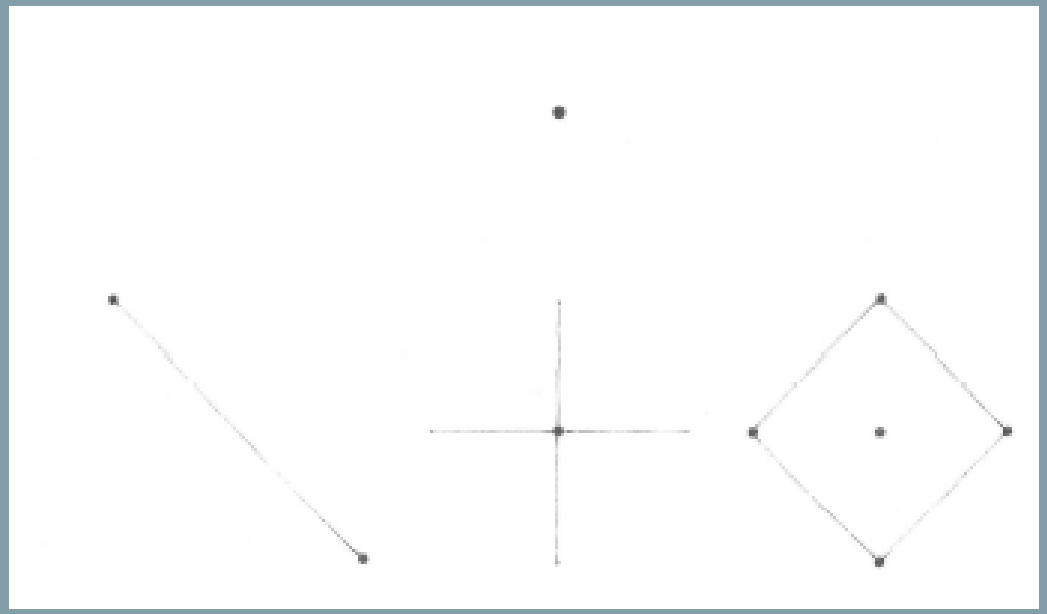
Point

- The point marks a **position** in space
- Conceptually it has **neither** length nor width nor depth

It is therefore **static, centralized** and **dimensionless**



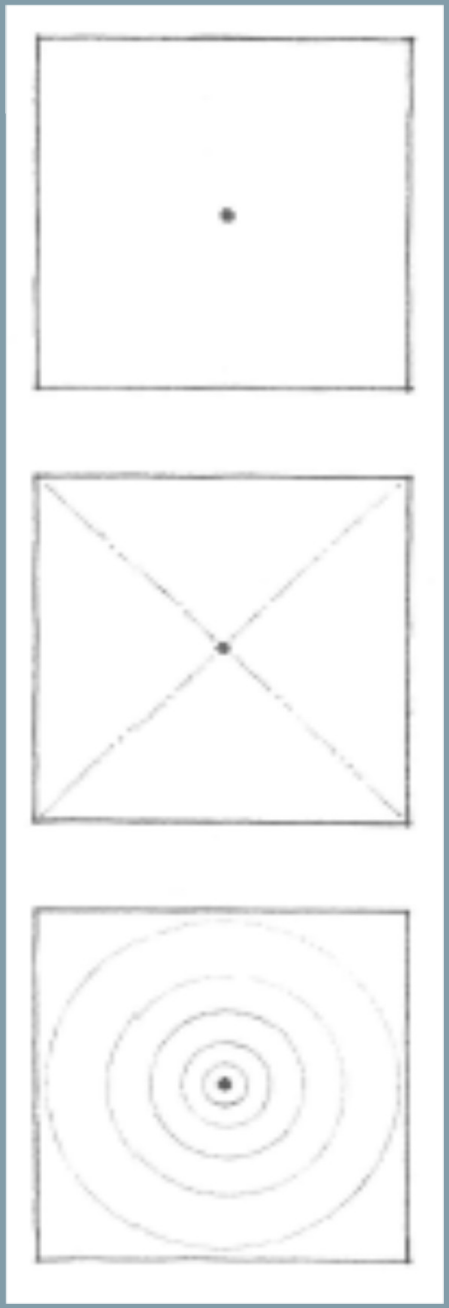
- As the first element of the shape vocabulary, the point can be used to mark:
- The **two ends** of the line
- The **intersection** of 2 lines
- The **corners** of a plane or volume
- The **center** of a field



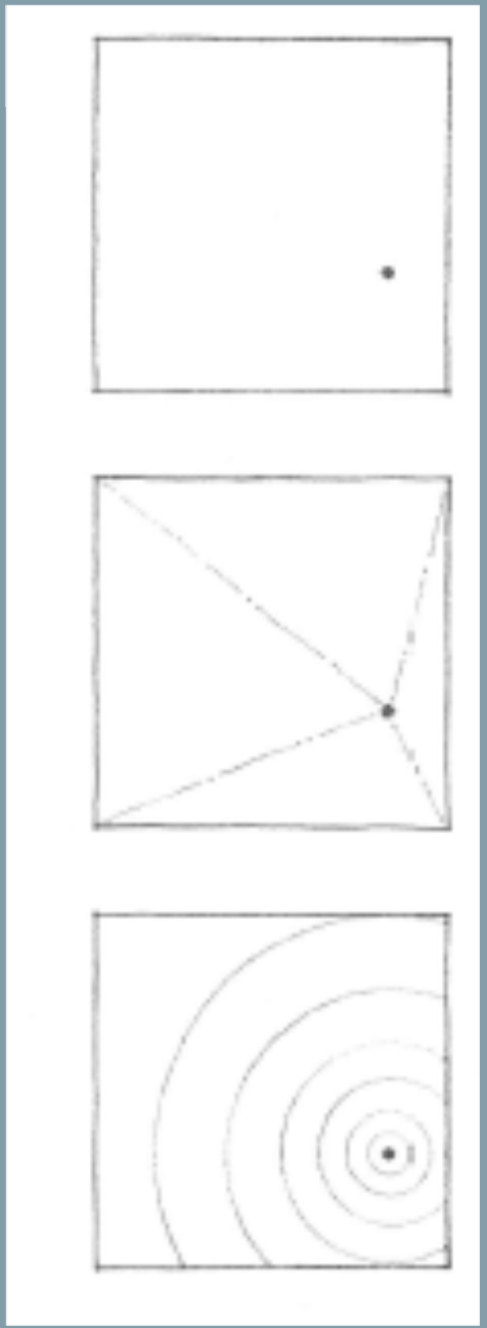
- The point marks its presence by its location in the visual field.

- At the center of an environment the point is stable and without movement

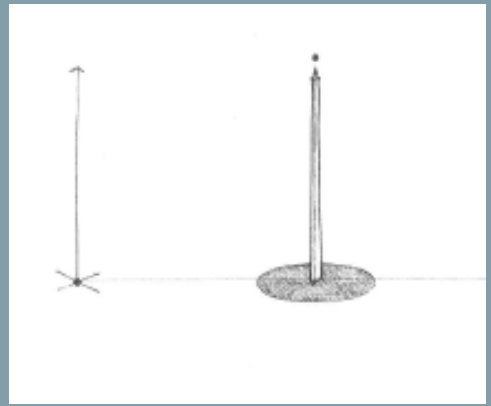
- Organizing the elements around it and dominating the field

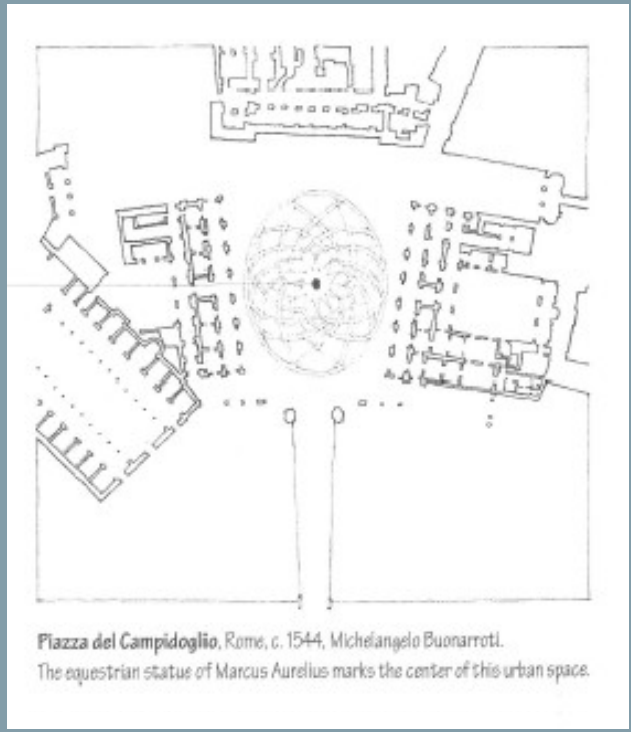


- But when the point moves from the center its field becomes more **aggressive** and a competition for dominance is engaged.
- A **visual tension** manifests between the point and its field



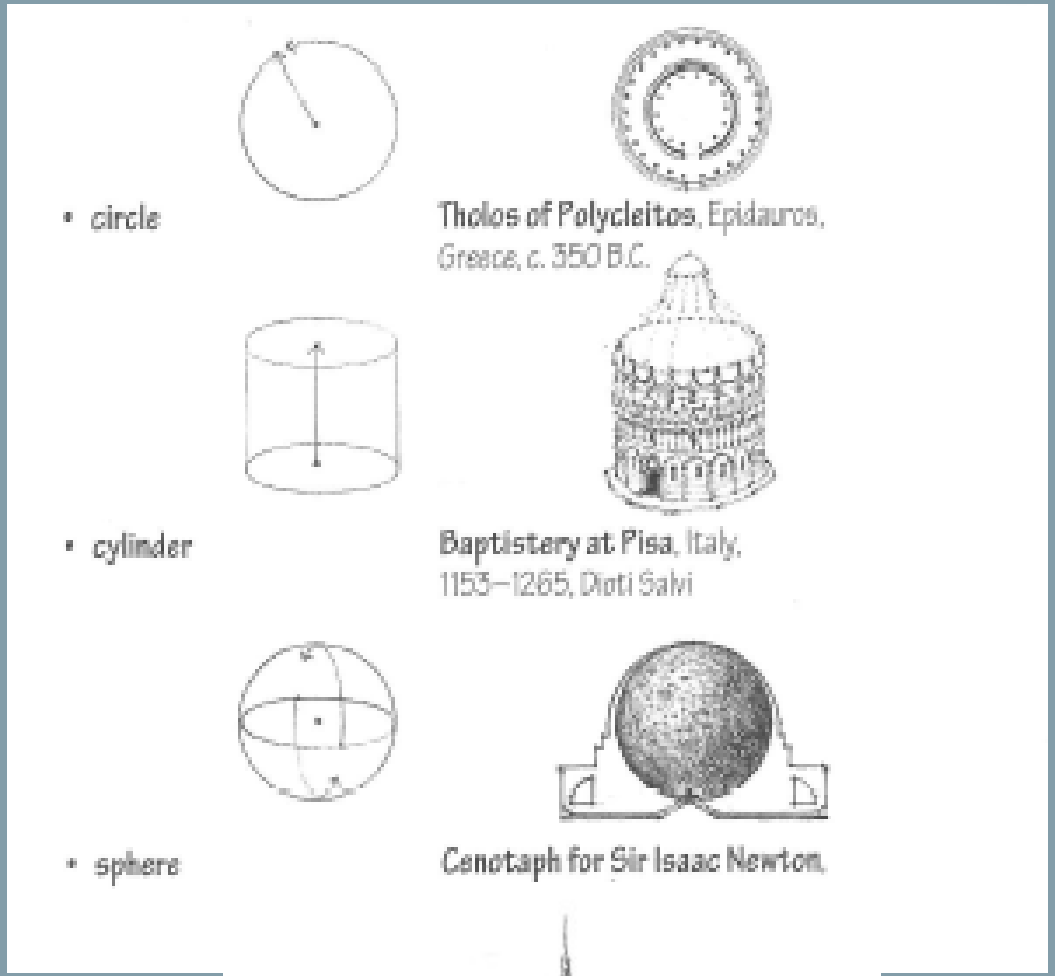
- **In Architecture :**
- As the point has no dimension to visually mark a position in space
- It is projected vertically as a linear shape like a post, obelisk or tower





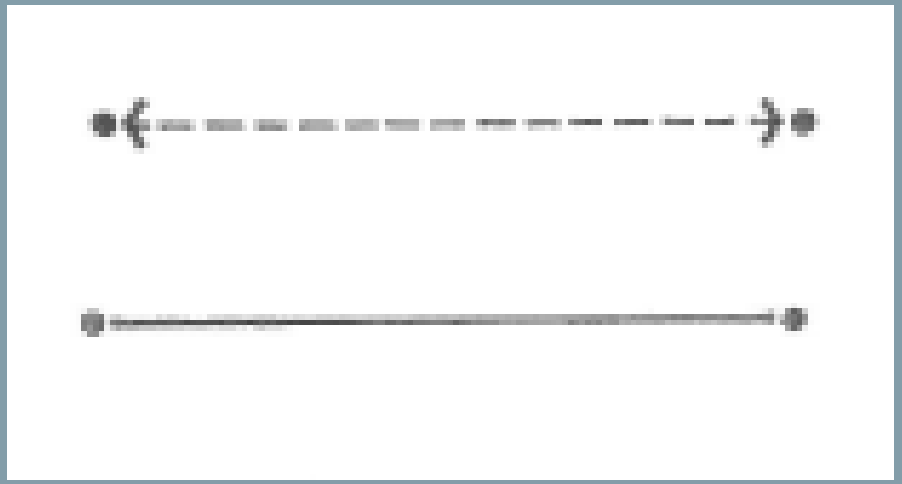
Piazza del Campidoglio, Rome, c. 1544, Michelangelo Buonarroti.
The equestrian statue of Marcus Aurelius marks the center of this urban space.

- Shapes generated by the point (the center) keep the same visual characteristics of the point :
- The circle
- The cylinder
- The sphere

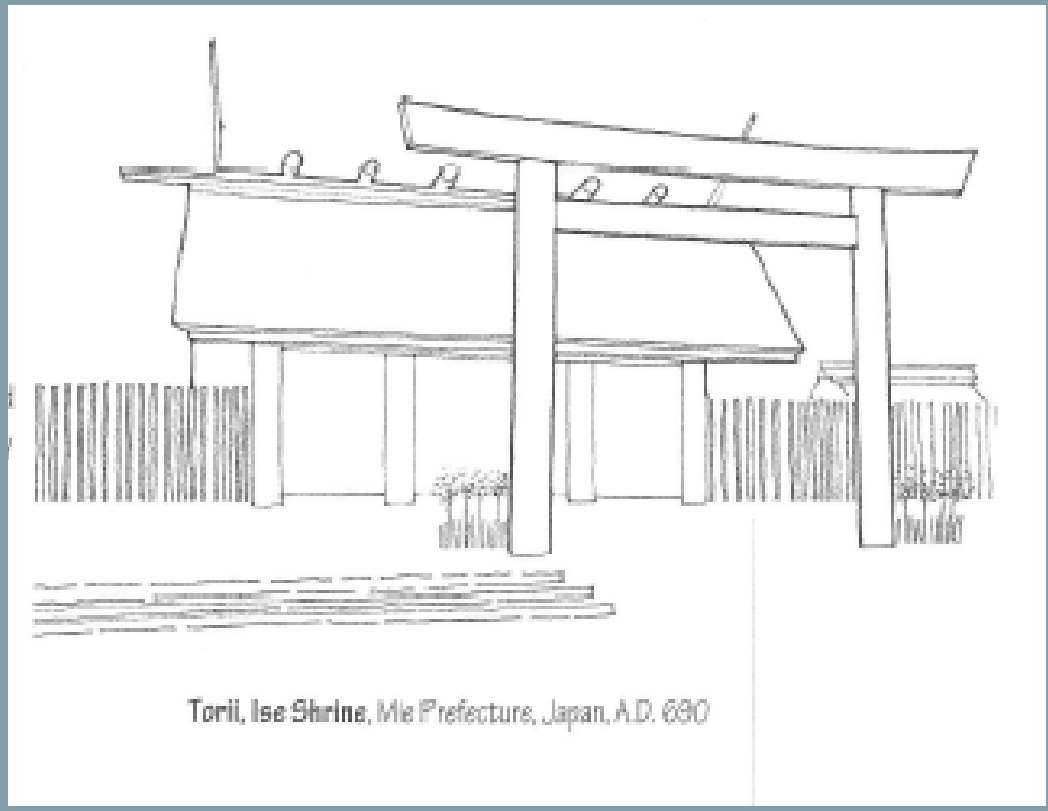


Two points²

- Two points describe a line that joins them
- The 2 points limit the line the line can be considered a segment of an infinite line



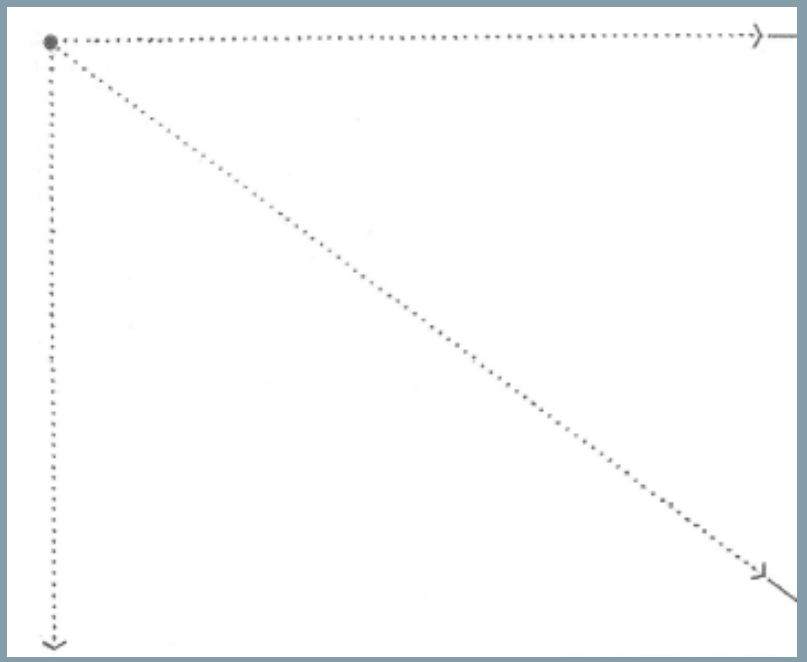
- 2 Points established in space by conical elements or centralized shapes can define
- axes
- order elements
- to organize the shape of the building and spaces



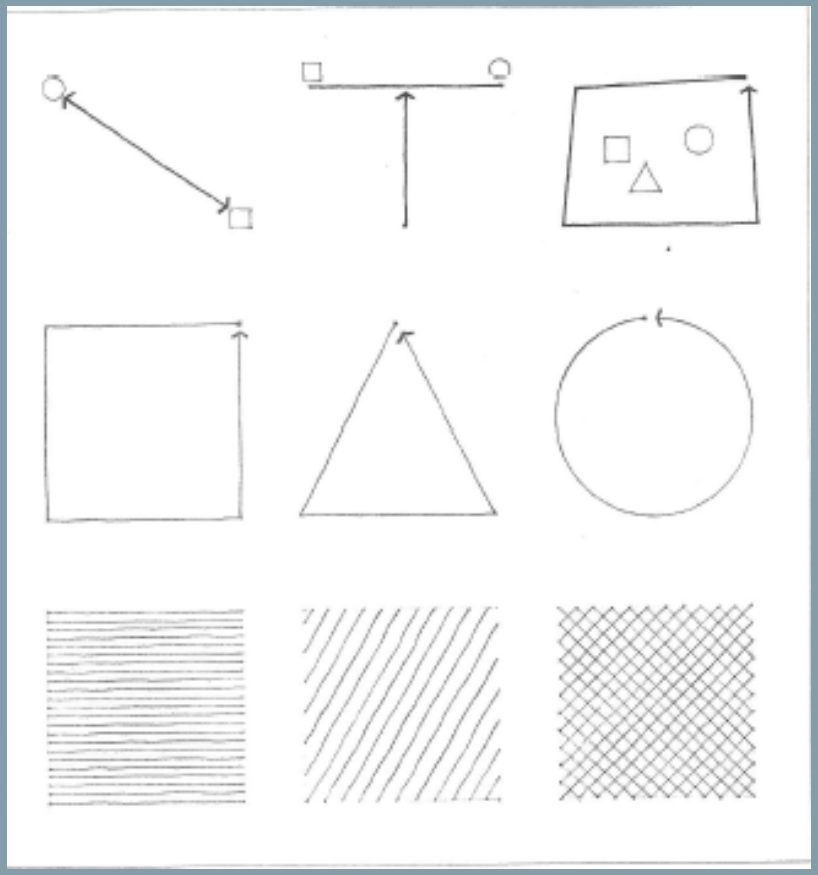
Torii, Ise Shrine, Mie Prefecture, Japan, A.D. 690

Line

- The extension of the point generates a line which conceptually has neither width nor depth.
- The line describes the **path** of **moving** points.
- The line is thus capable of expressing a **direction**, a movement and a development.



- The line is thus an important element in the formation of visual constructions



- It is used to **join**, **unite, assemble, surround** and **delimit** visual elements.

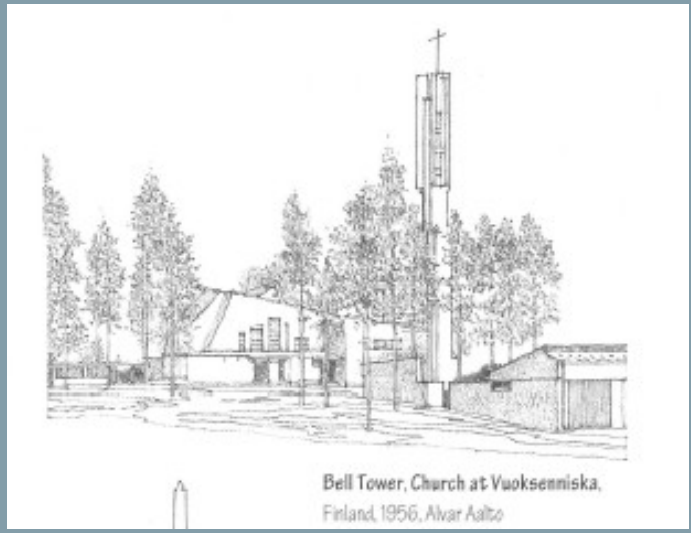
- Describe plan boundaries.
- Articulate plans.

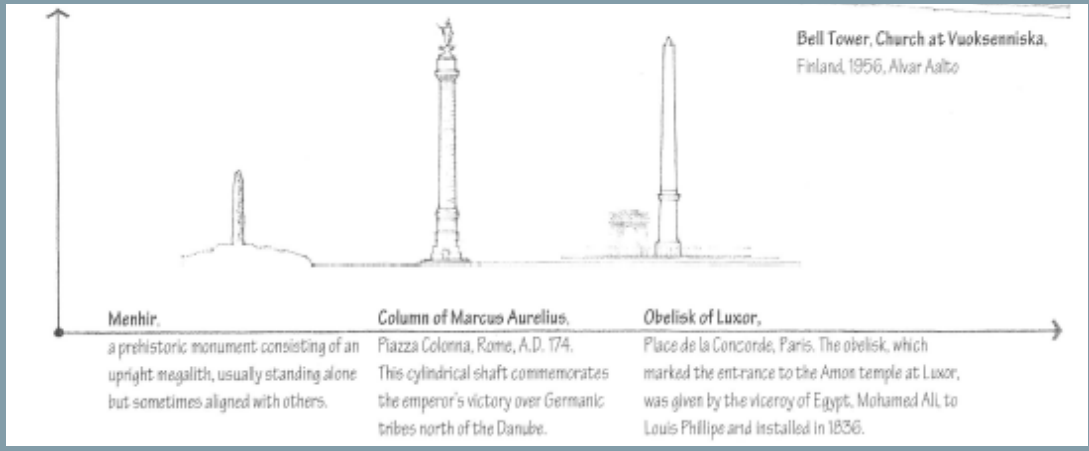
Linear elements in Architecture

Linear elements in Architecture

- Vertical linear elements like
  - **columns**,
  - **obelisks**,
  - **towers**,
  - **minarets**

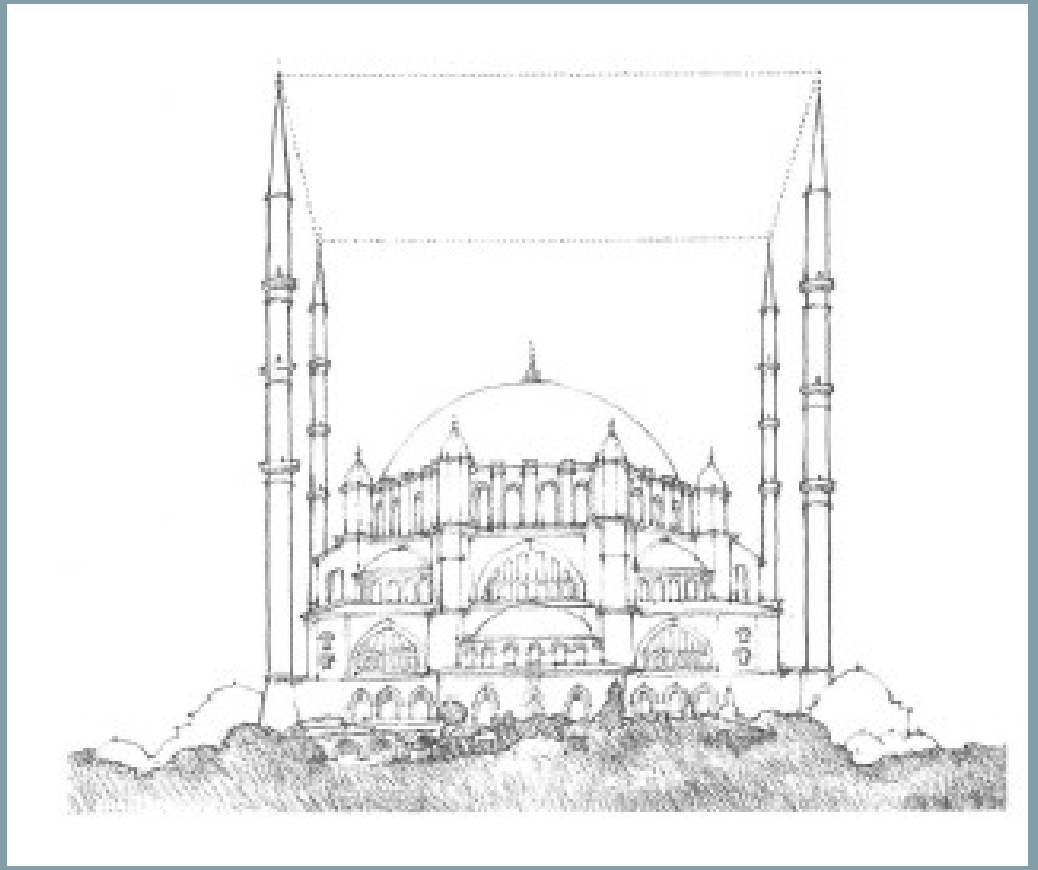
have been used to mark important events and establish particular points in space





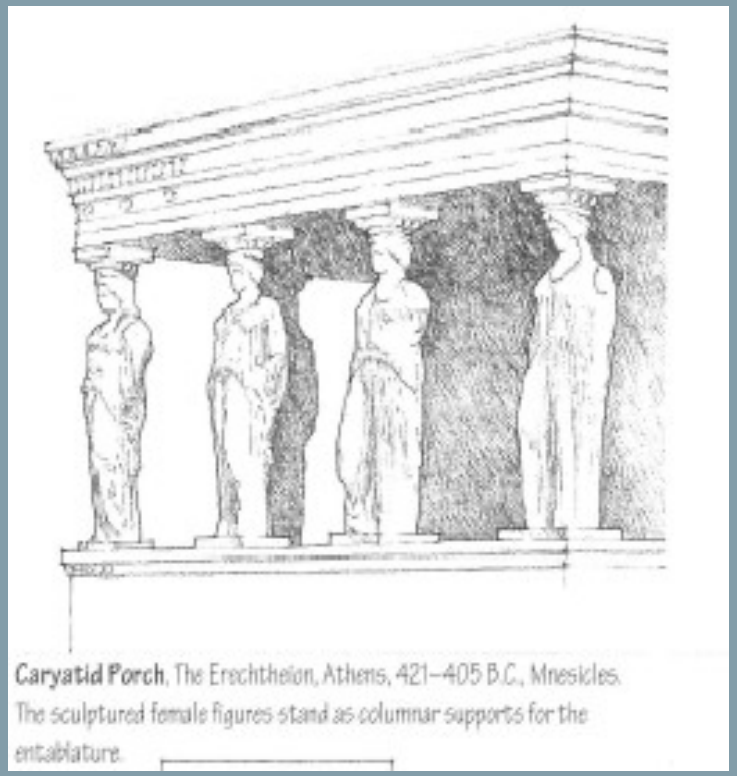
- Vertical linear elements define transparent volumes in space.

- In this example the mosque of Bey Salim Turkey, the 4 minarets form a field for the magnificent expansion of the dome

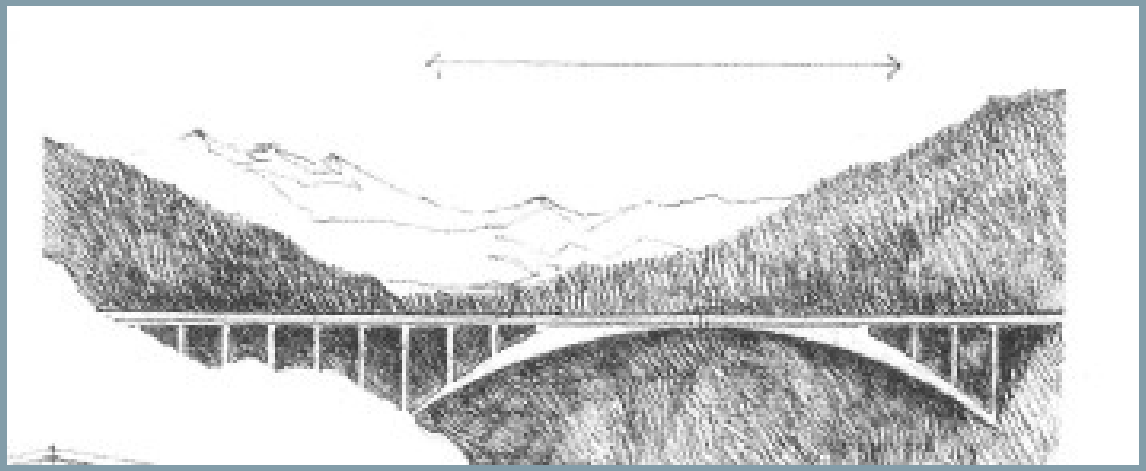


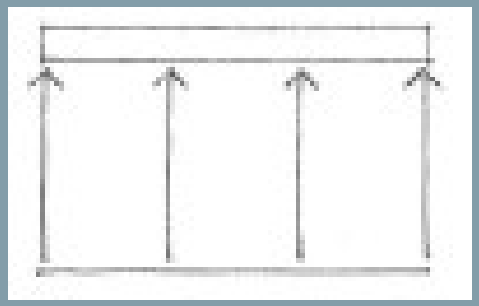
- Linear elements that have the necessary materials and strength can play the role of structure

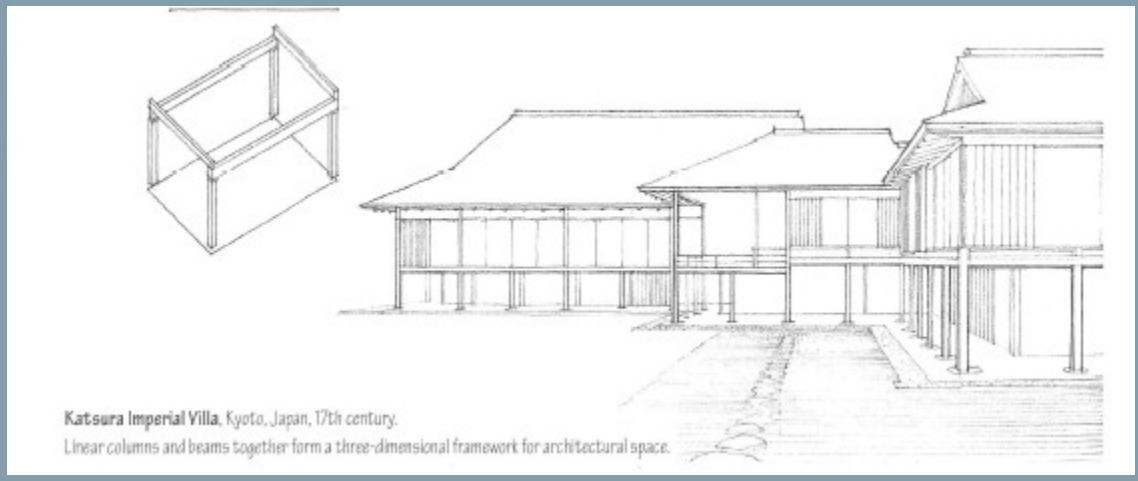
- In the following examples the linear elements express:
- Movement through space
- Support higher planes
- Form a three-dimensional structure for architectural space



Caryatid Porch, The Erechtheion, Athens, 421–405 B.C., Mnesicles.
The sculptured female figures stand as columnar supports for the entablature.

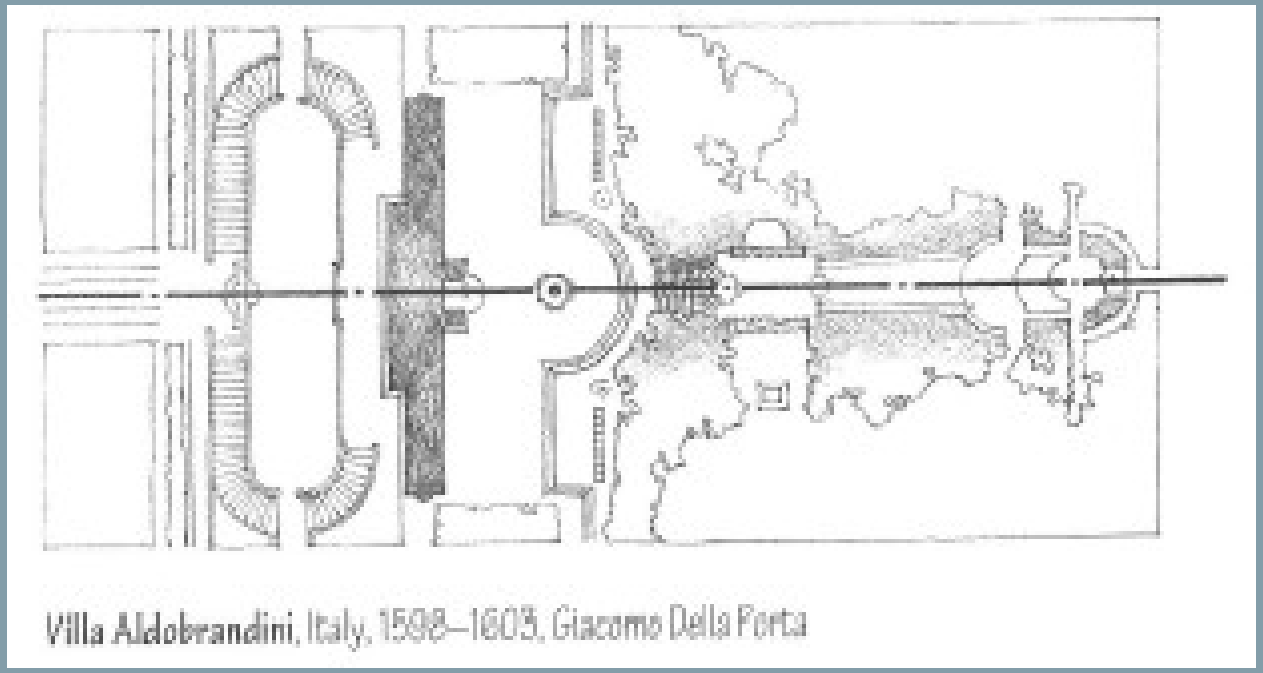






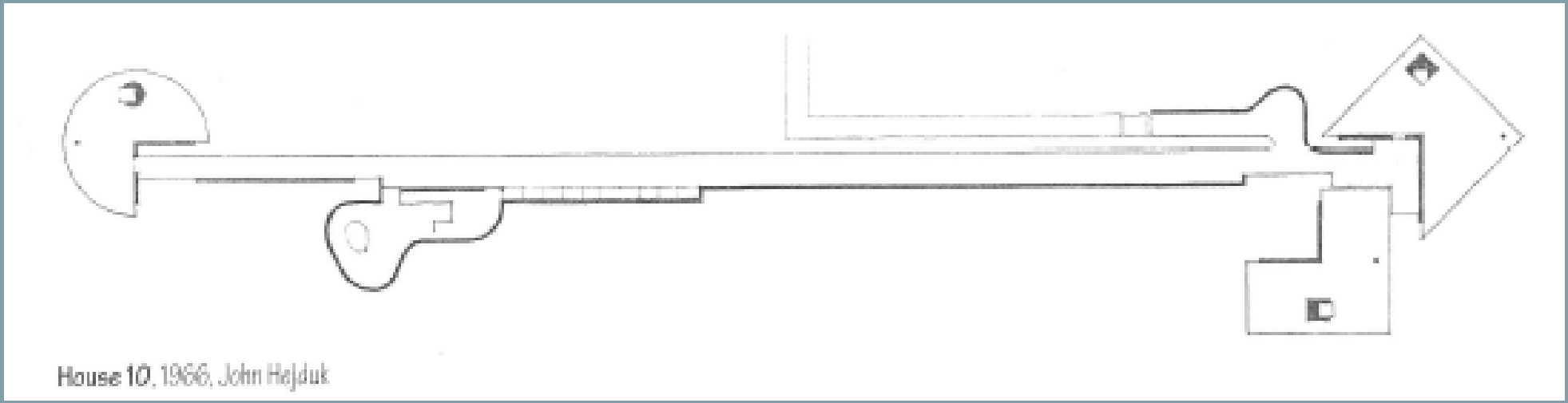
Katsura Imperial Villa, Kyoto, Japan, 17th century.
Linear columns and beams together form a three-dimensional framework for architectural space.

- A line could be an **imaginary element** not visible
- Regular line established by 2 distant points in relation to which all the other elements are arranged in a symmetrical manner



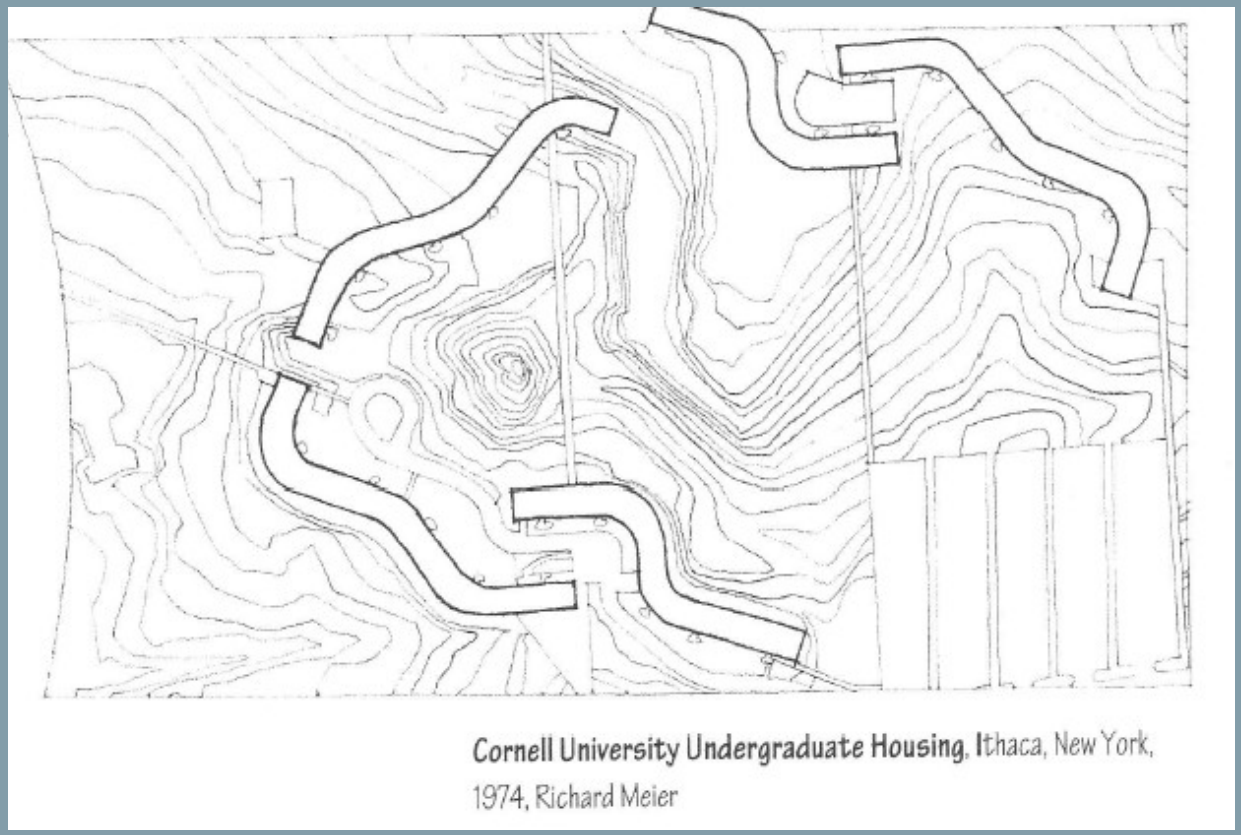
Villa Aldobrandini, Italy, 1598–1603, Giacomo Della Porta

- Although architectural space is three-dimensional it could be linear in form to contain movement through a building to serve its spaces



House 10, 1966, John Hejduk

- Buildings with linear shapes can contain the surrounding outdoor spaces thus marrying and integrating into the site



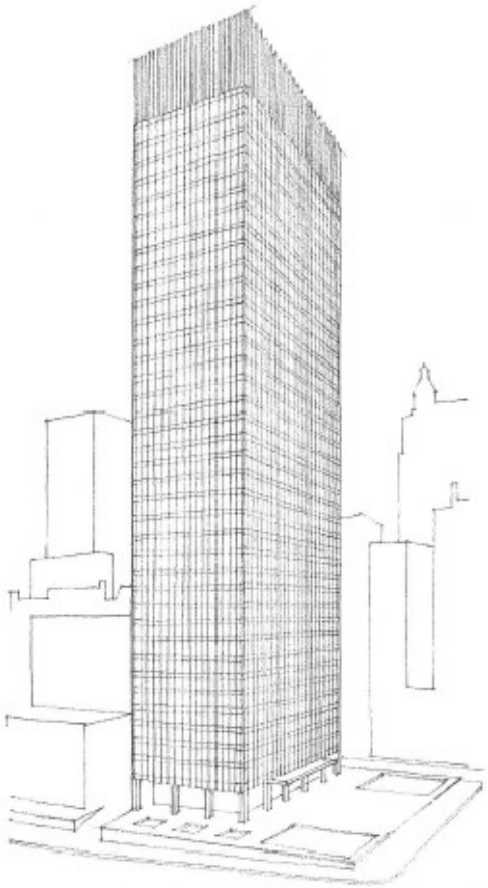
Cornell University Undergraduate Housing, Ithaca, New York, 1974, Richard Meier

Lines can articulate the borders and surfaces of plans and volumes. These lines can be expressed by the joints between buildings, window and door frames or by the grid of the structure

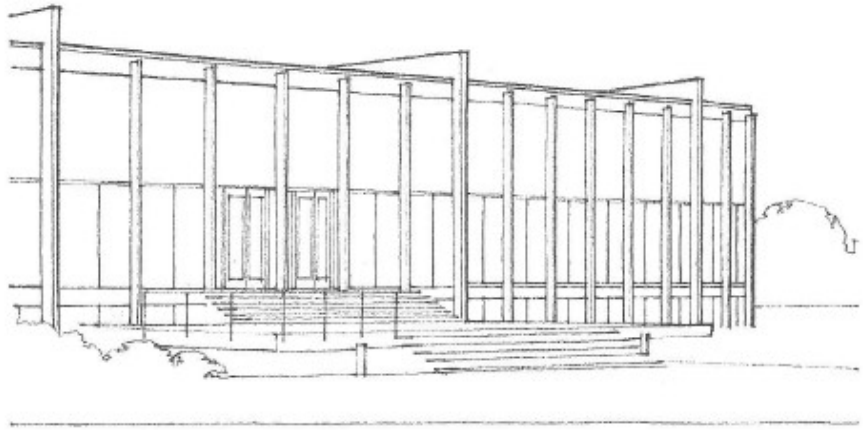
Lines can articulate the borders and surfaces of plans and volumes.

- How these lines affect surface texture depends on their visual weight spacing and direction

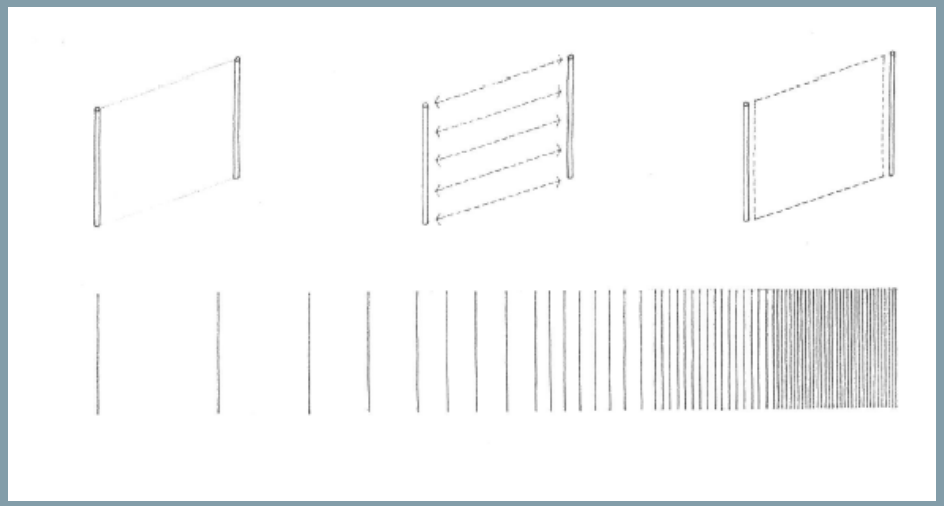
Town Hall, Säynätsalo, Finland, 1950–52, Alvar Aalto

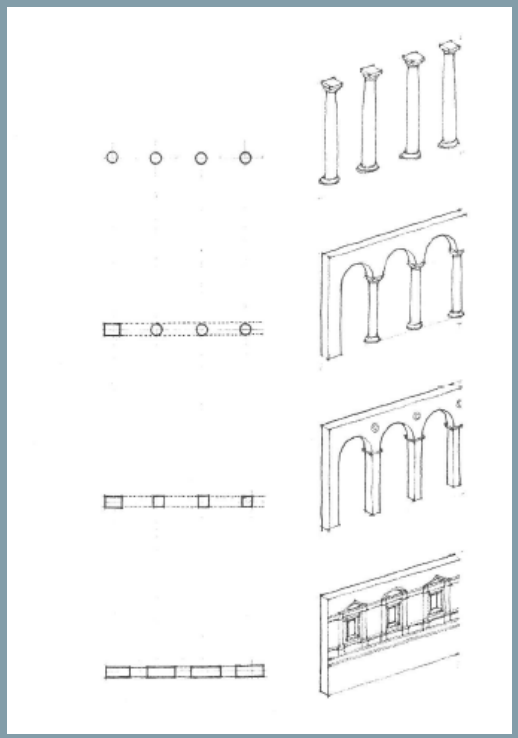


Seagram Building, New York City, 1956–58, Mies van de Rohe and Philip Johnson

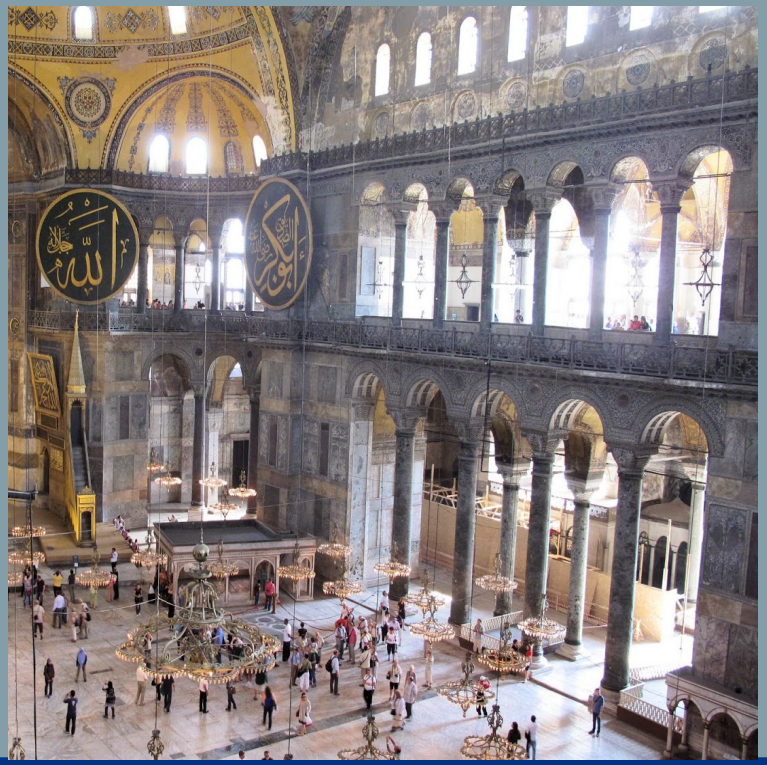


Crown Hall, School of Architecture and Urban Design, Illinois Institute of Technology, Chicago, 1956, Mies van der Rohe

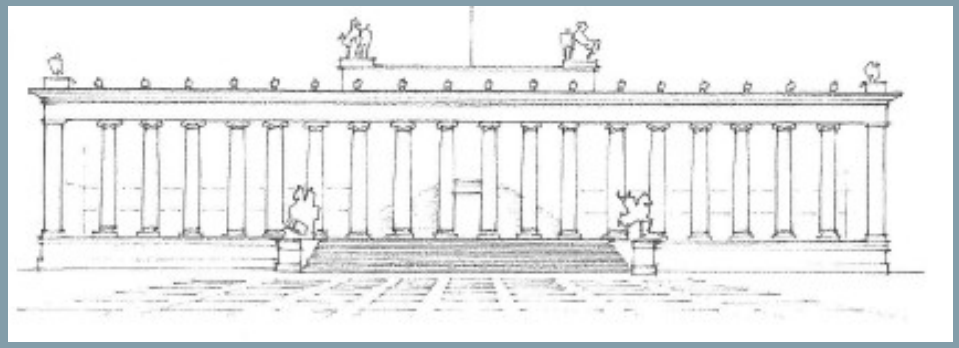


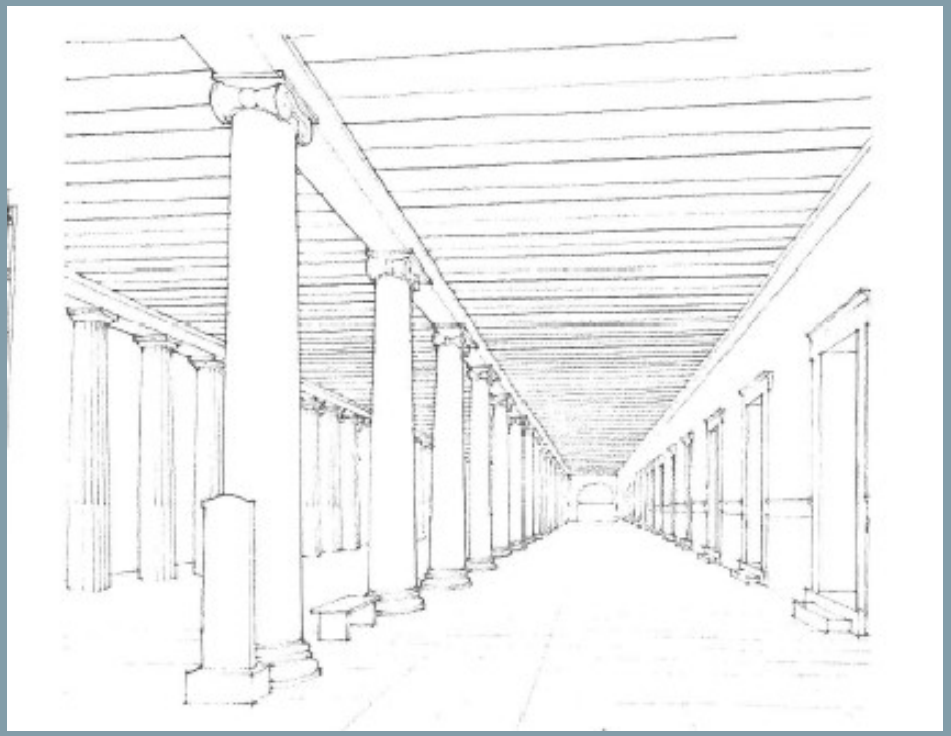


- Two parallel lines have the visual ability to **describe a plan**
- Columns are **structural compositional** elements of the wall and facade.

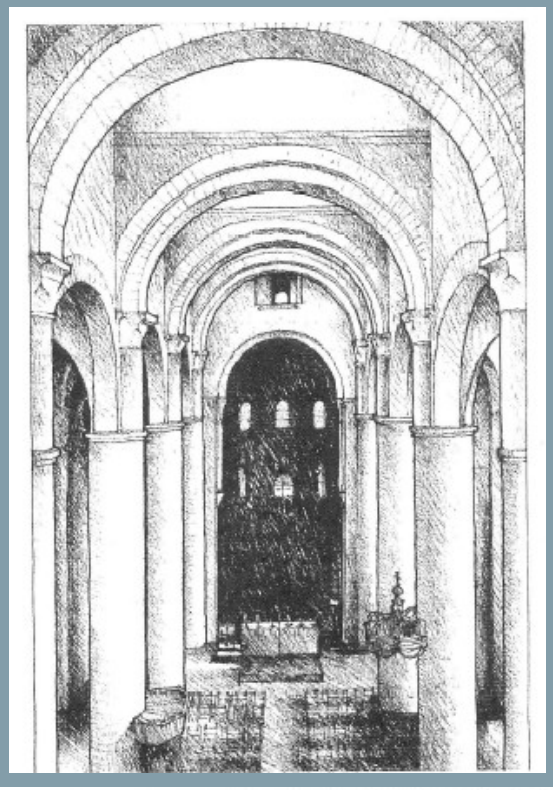


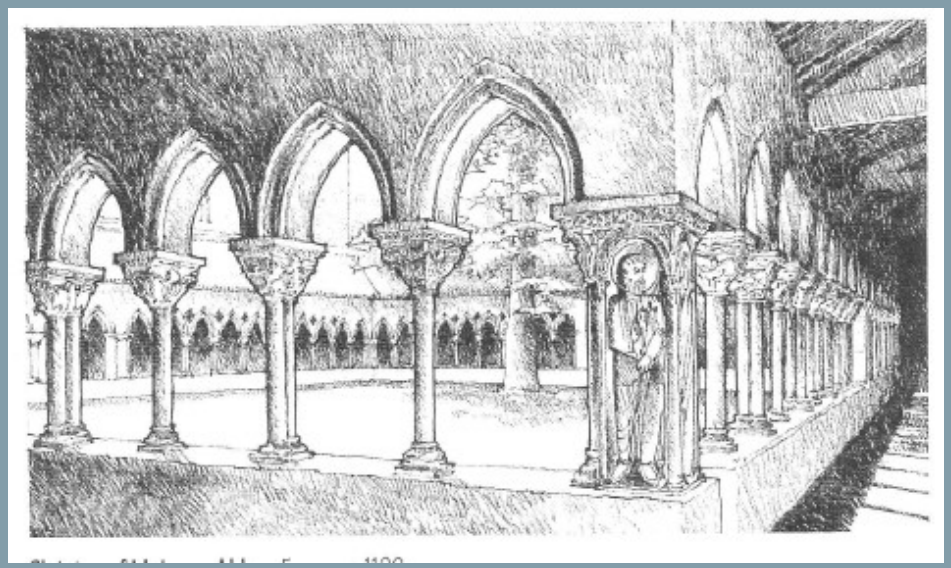
Perforated wall in Aya Sophia



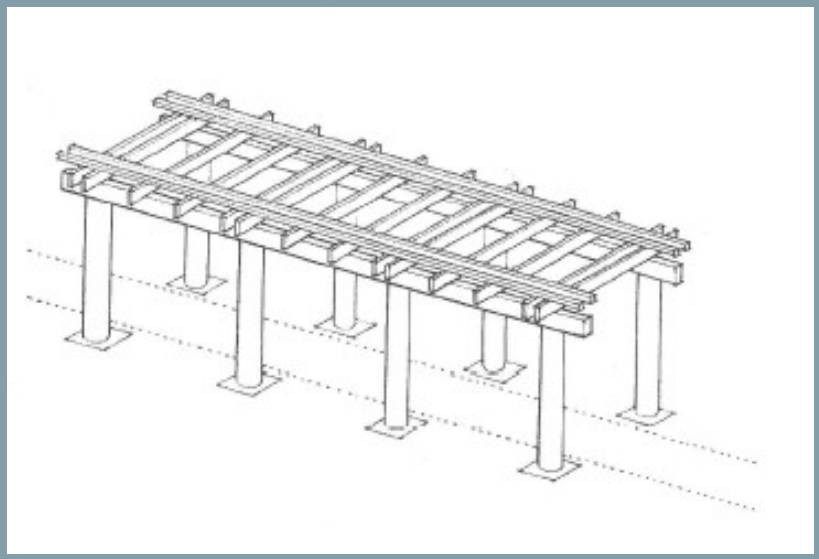


- In architecture two parallel column lines create a semi-transparent screen. This participates to :
- establish a facade
- create circulation spaces
- Unify and articulate spaces.

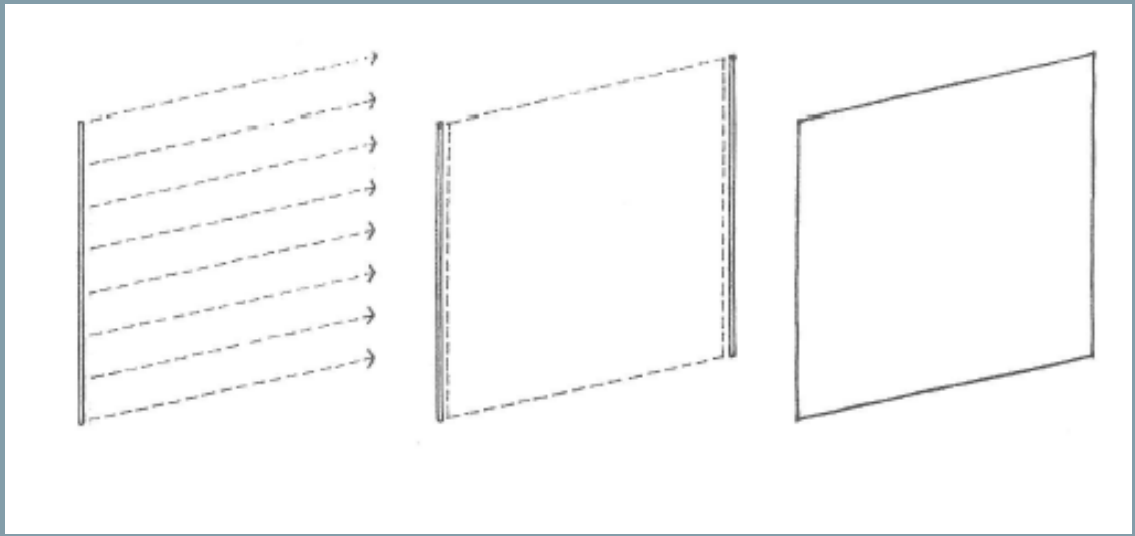


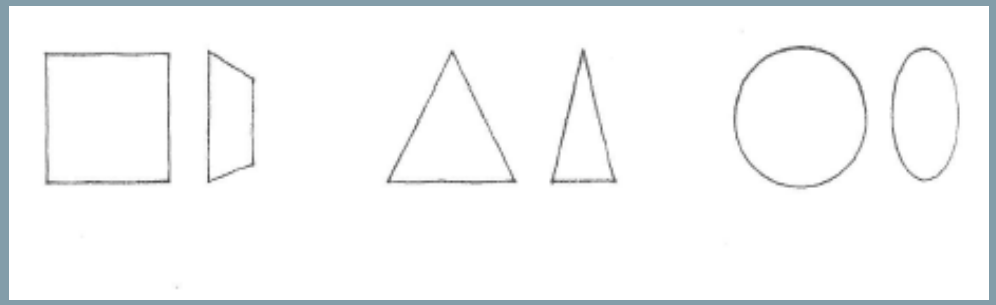


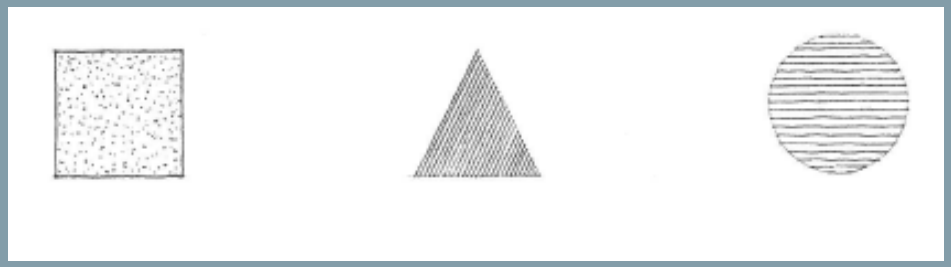
- Create boundaries
- Contain spaces
- Create directions



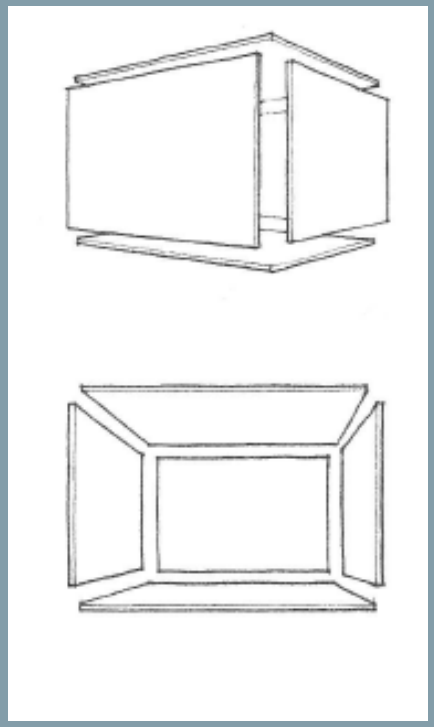
Architectural Plans

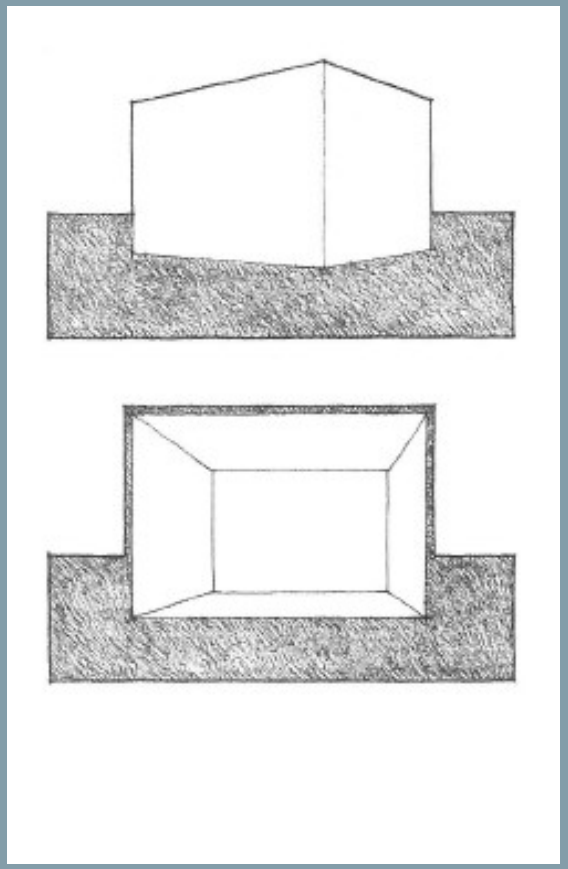






- **Shape** is the first characteristic of the plan
- Additional features are:
- **The surface**
- **The colour**
- **The texture**
- **The model**



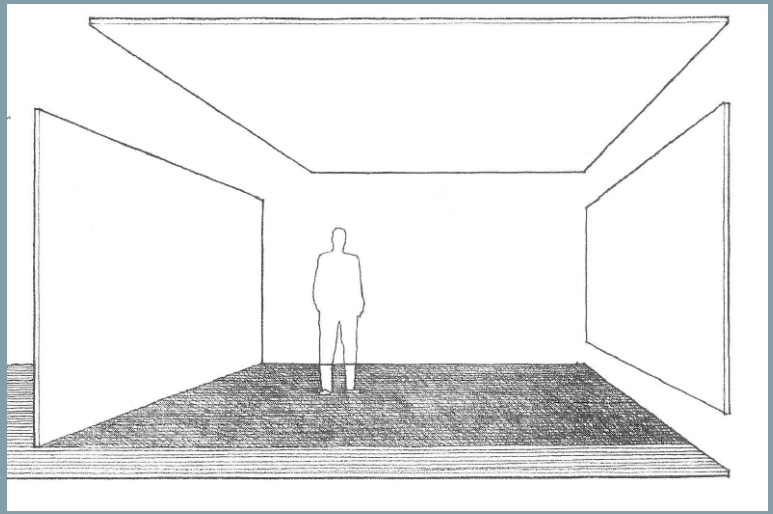


- In architecture, plans define the three-dimensional volume of **masses** and **spaces**

  Their Characteristics :

  - **Dimension**
  - **Shape**
  - **Colors**
  - **Texture**
  - Their **spatial relationships**
  - The **quality** of the spaces they determine.

- In architectural design we manipulate three types of plans:
- **Upper plan** which represents the ceiling of a space
- **Wall plan** which is vertical and which is vital to the shape of the architectural enclosure



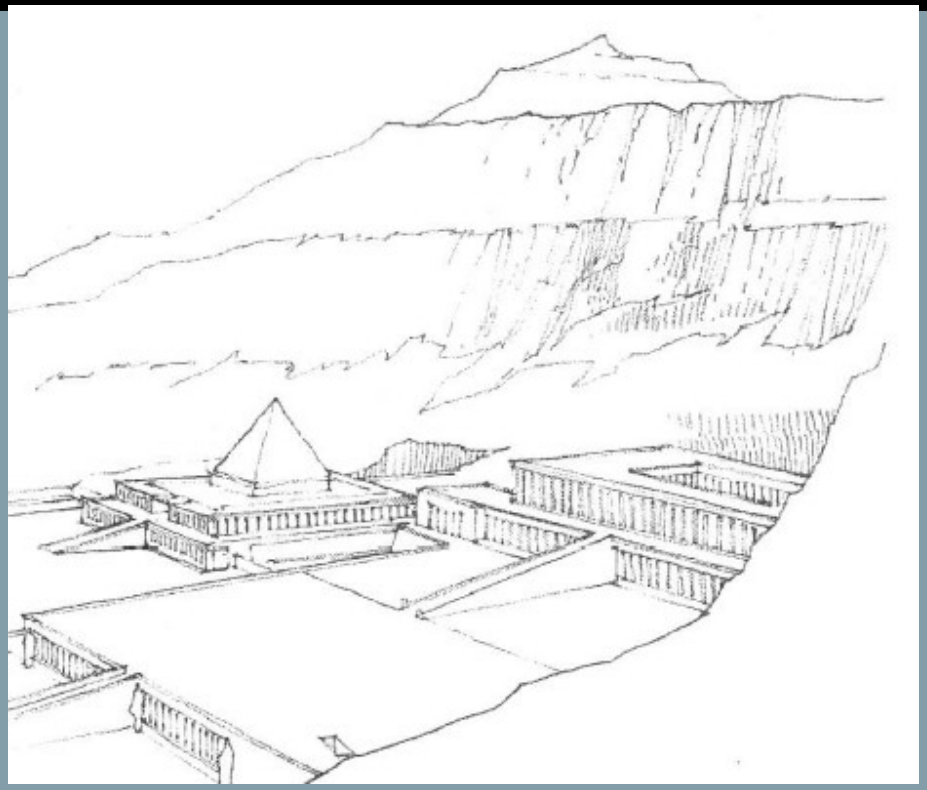
- **Lower Plan** Base plan that serves as a foundation for the shape of the building

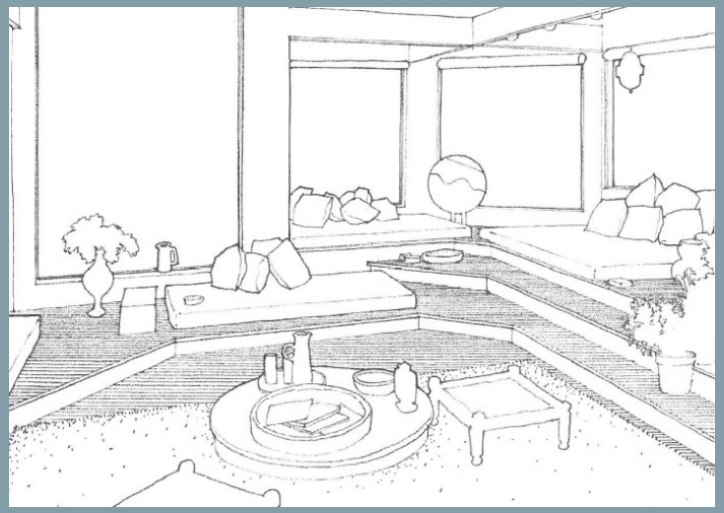
- The lower ground plan supports all architectural construction with all site conditions (Climate topography, etc.)
- Topographic features influence building form

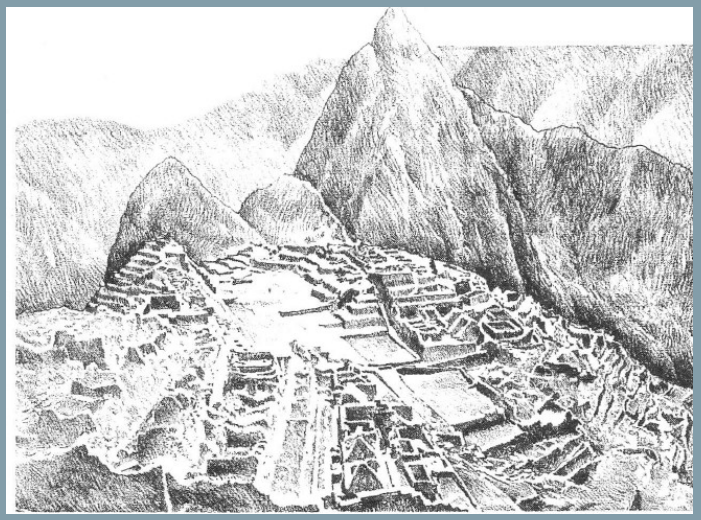
- The building can emerge, integrate or develop from this plan

Plazza de Espana in Rome.

- The land plan can also be manipulated to create the project base:
- Raised
- Flooded
- Cut out



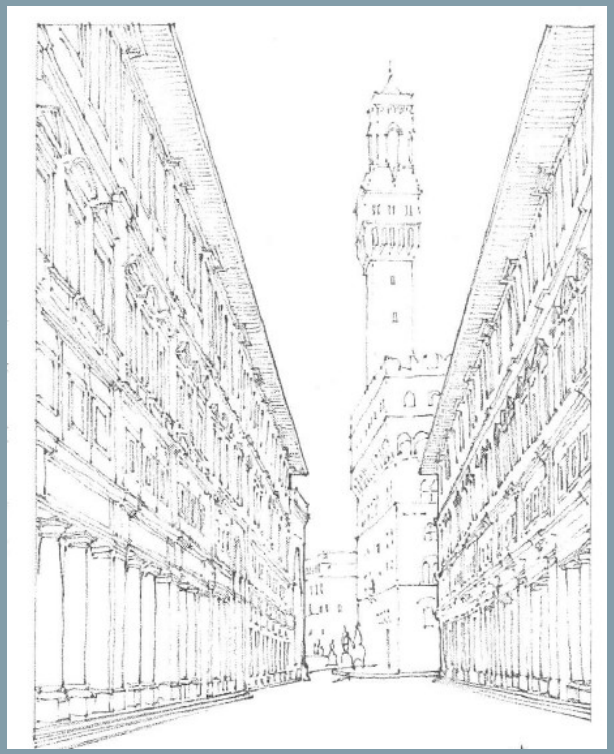


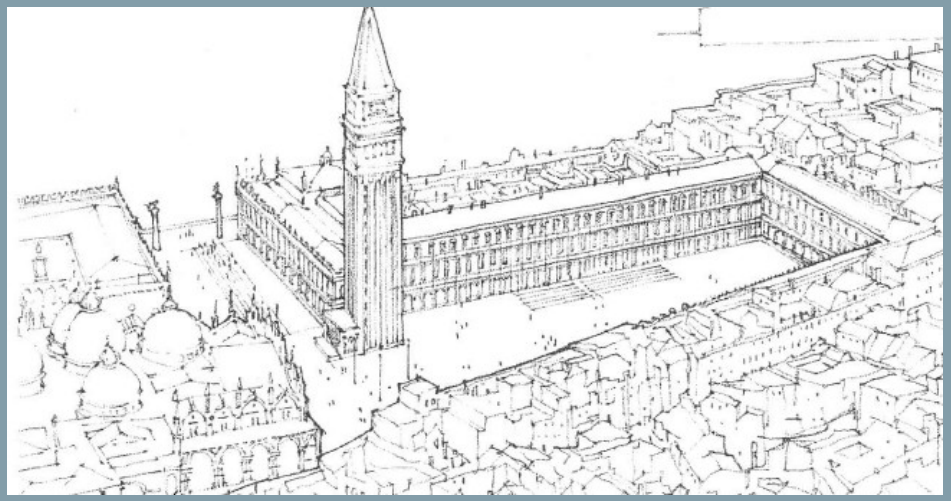


- The wall plan isolates part of the space to create an interior environment. It thus determines
- **Intimacy**
- **Protection** of natural elements

- It creates the **form**
- The **image**
- The **mass** of the building

- The exterior plan generates :
- The facade of the building
- The streets
- Places
- Public spaces

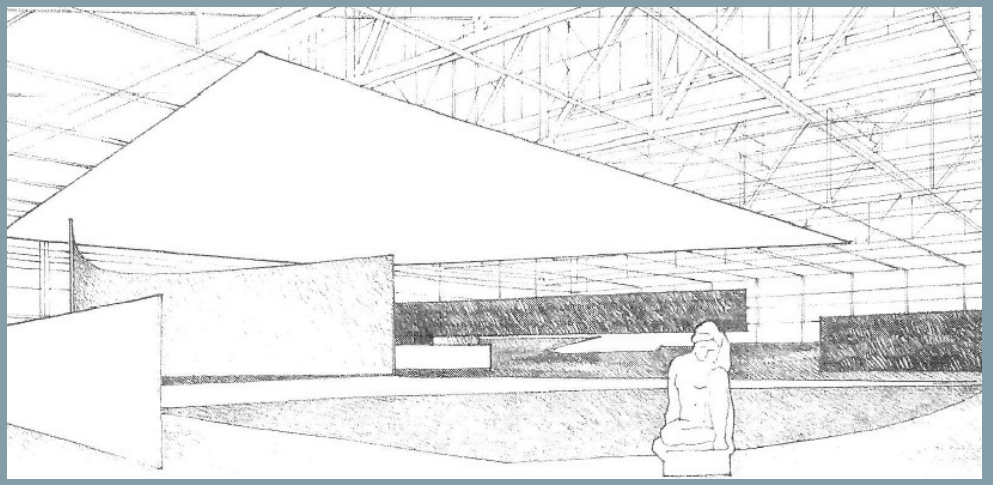


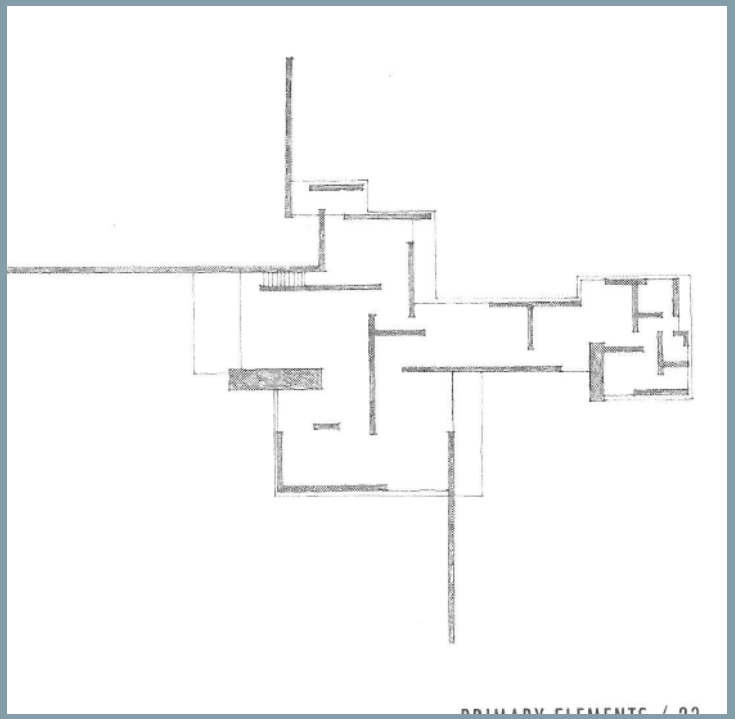


- The Inner (wall) Plan generates:

- The form
- The dimensions of interior spaces

* Relations between spaces





- The Superior Plan

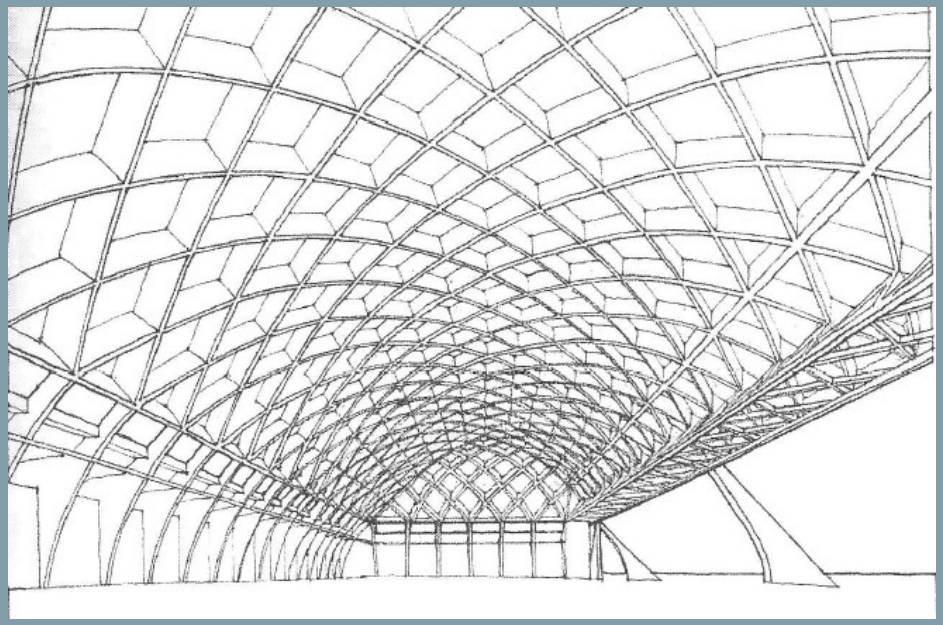
Determine the space in its shape and vertical dimension:

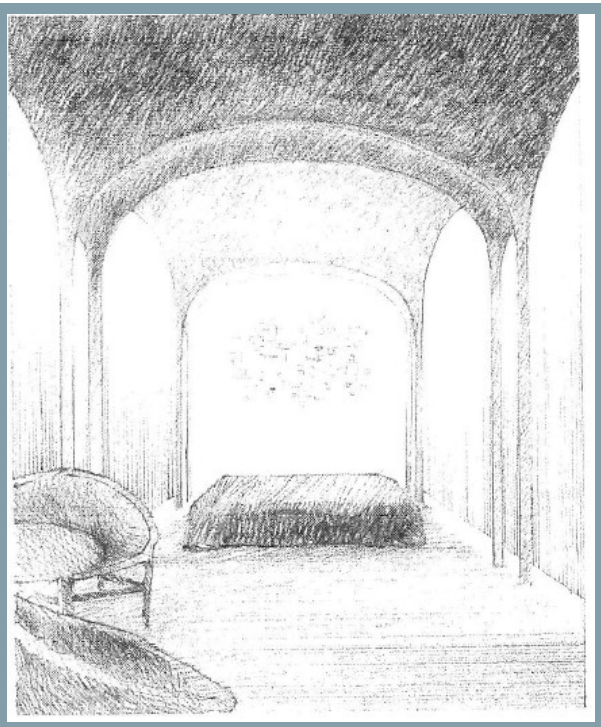
It signifies :

- **Protection**
- The **unity** of spaces

It can alter

- the **scale** of space
- Light and acoustic quality
- It can subdivide space into zones

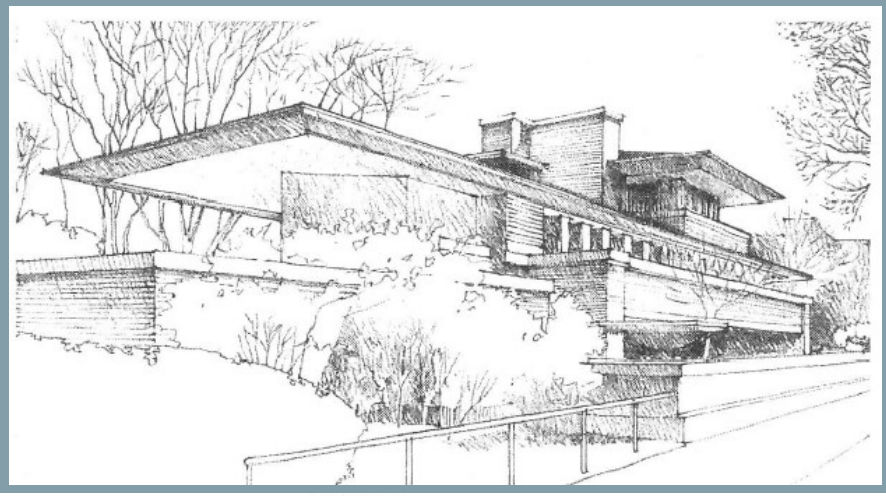




- The Superior Plan

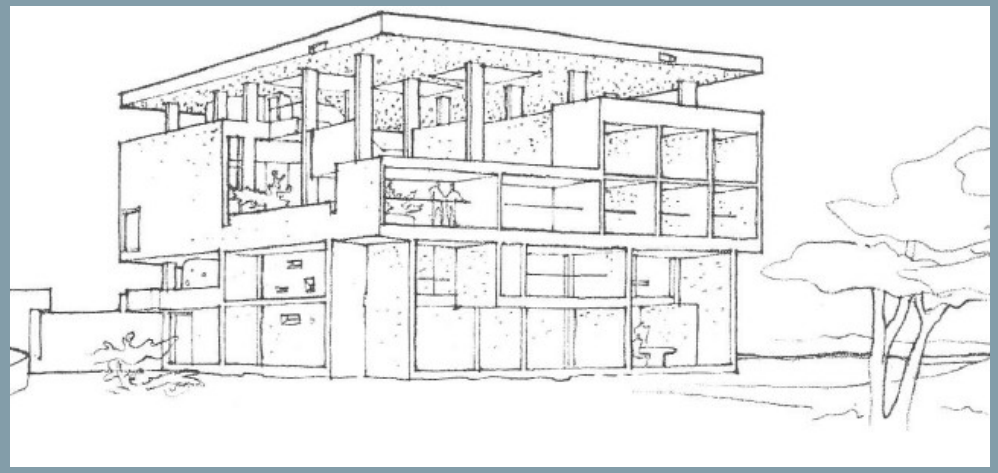
Can be hidden outside

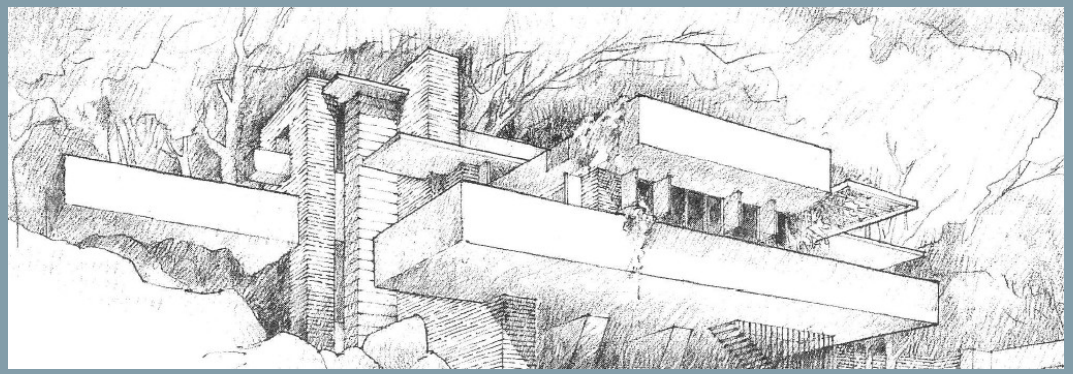
Or on the contrary develop to reinforce the volume of the building



It can be developed:

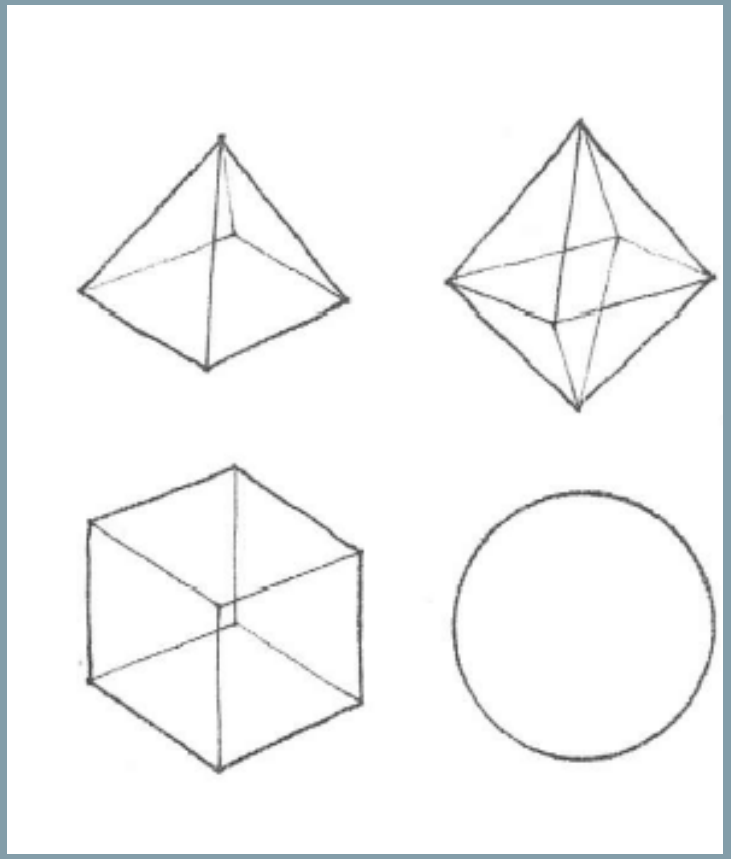
- As a single element
- Fragmented into several units

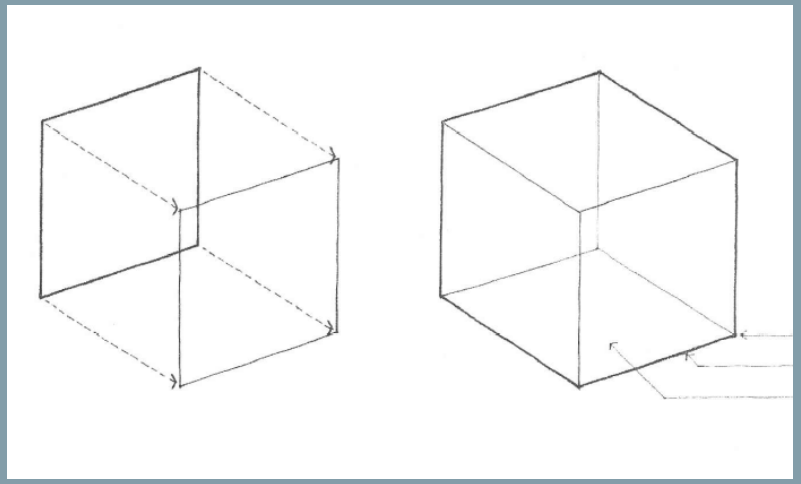




Volumes in Architecture

- The extension of the plan creates the volume :
- The volume consists of:
- Points
- Of lines
- Planes or surfaces that define the limits of the volume



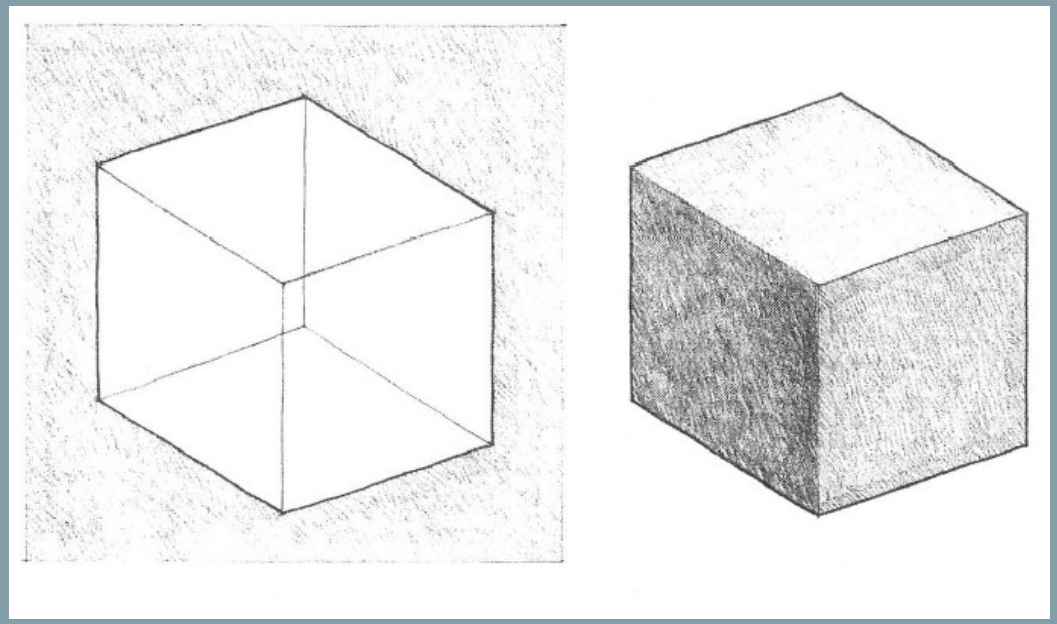


- The shape is the first characteristic of

- As 3D is the main vocabulary of architectural design
- the volume can be:

- Solid given by the masses

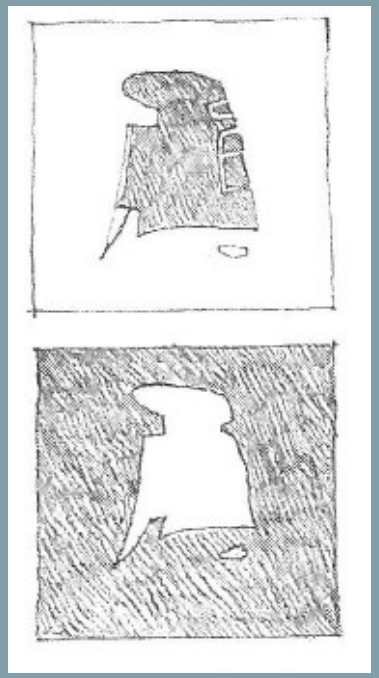
- Emptiness contained by plans

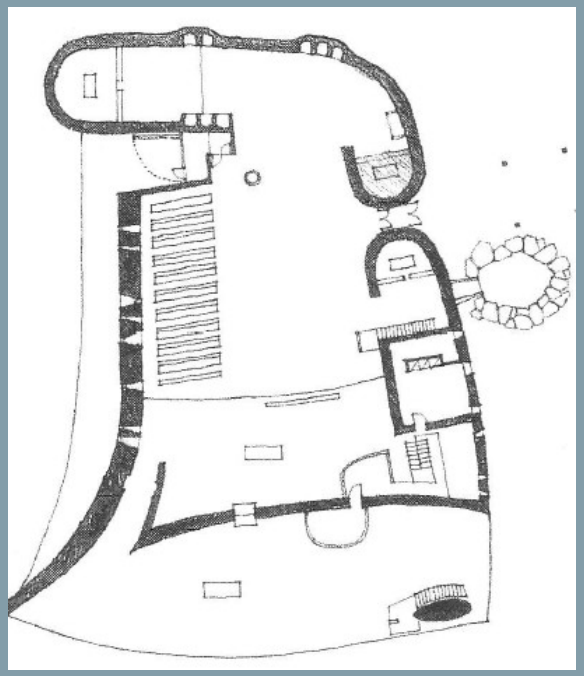


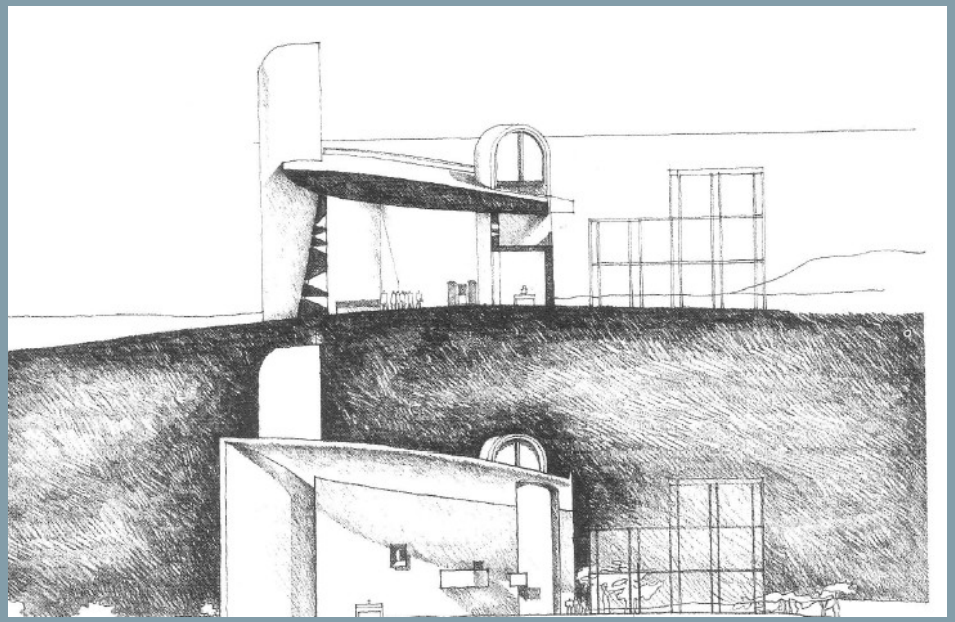
- In architecture the volume can be described as:

- a portion of the space limited by the walls, ceiling and floor

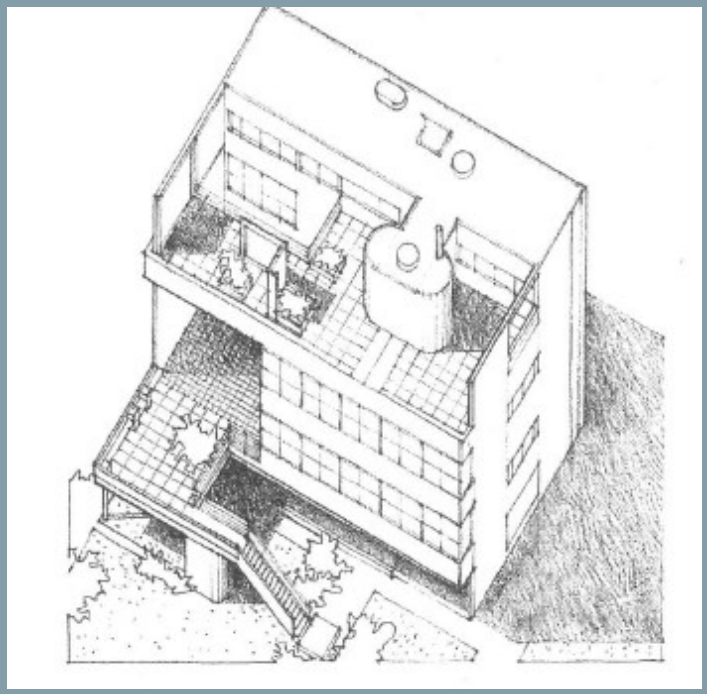
- the quantity of space contained in the mass of the building

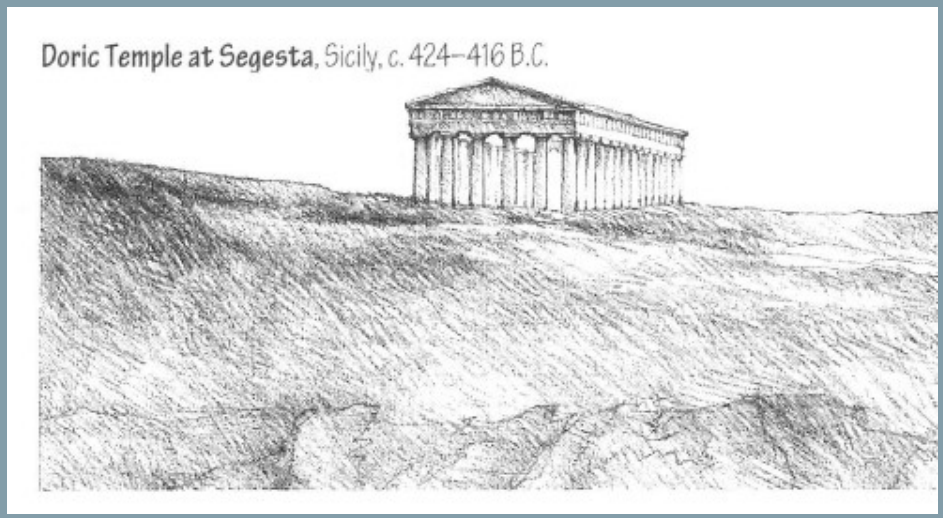






- A building in a landscape:
- Can be seen or described as an element that occupies a volume of space





- Building shapes that serve as containers:
- Can be seen or described as masses that define the volumes of space