

Lecture-3

# **GEOMETRICAL DESCRIPTION OF FUNCTIONAL SPACE**

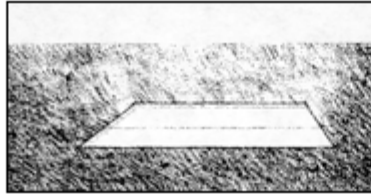
# the Geometrical Description of Functional Spaces

## Elements of Spatial Definition

1. Horizontal Elements
2. Vertical Elements
3. Openings

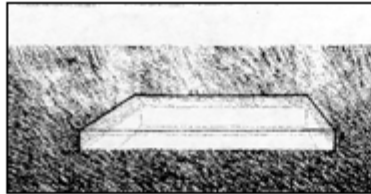
# Horizontal Elements Defining space

**BASE PLANE**  
A horizontal plane  
lying on a floor



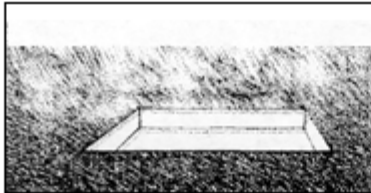
It defines a simple field of space

**ELEVATED  
BASE PLANE**  
A horizontal plane  
elevated above the  
ground plane



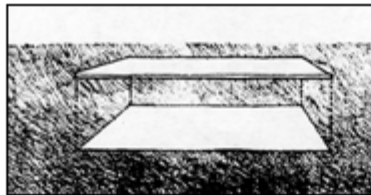
Vertical surfaces along its edges reinforce the visual separation between its field and the surrounding ground.

**DEPRESSED  
BASE PLANE**  
A horizontal plane  
depressed into the  
ground plane



Vertical surfaces of the lowered area define a volume of space.

**OVERHEAD PLANE**  
A horizontal plane  
located overhead



It defines a volume of space between itself and the ground plane.

# 1-Base Plane



- Plane shall be seen as figure must be change in color, tone, or texture
- The stronger the edge, the more distinct will be its field
- The horizontal plane creates a spatial zone or realm within its boundaries





**Exterior of Glass House, New Canaan, Connecticut, 1949, Philip Johnson**



**Interior of Glass House, New Canaan, Connecticut, 1949, Philip Johnson**

# Elevated Base Plane

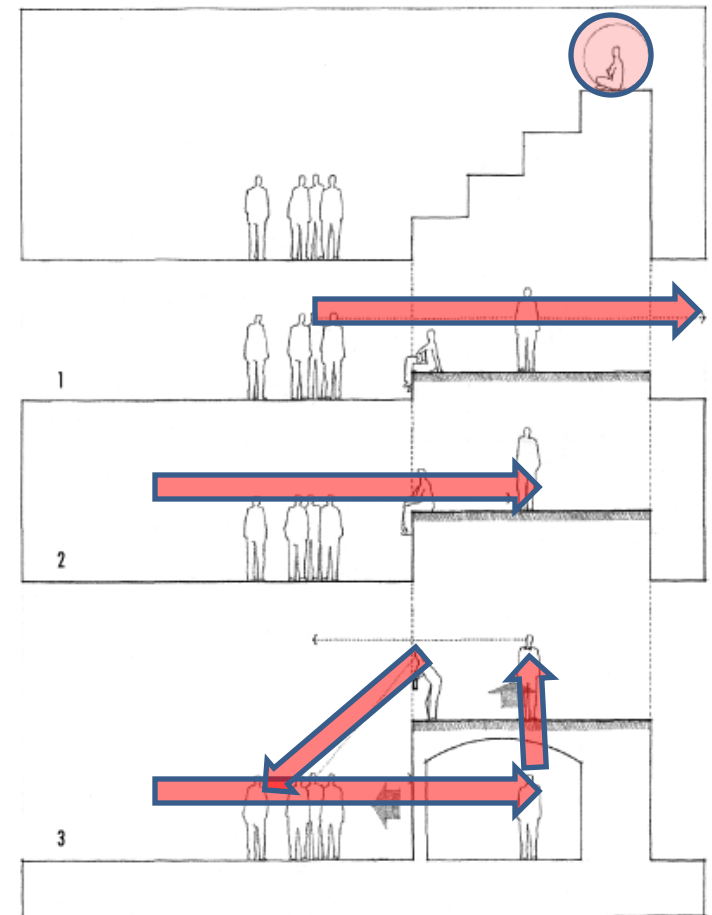
- Can be constructed on the existing site condition / artificially constructed above the surrounding context
- Venerate Sacred and honorific Building



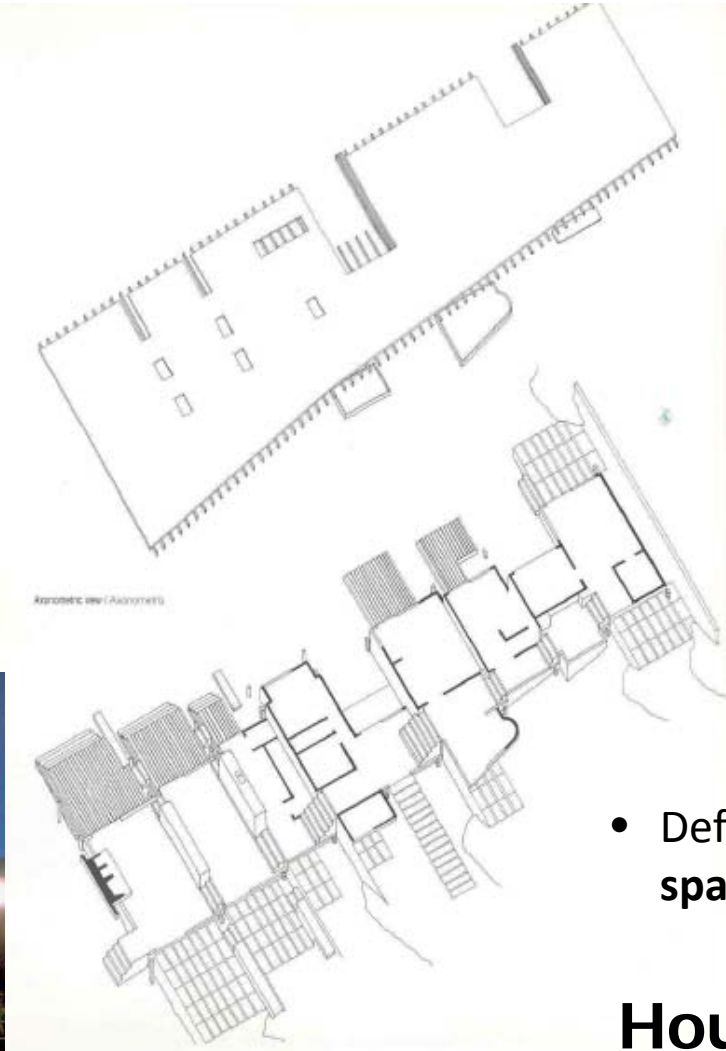
The **Acropolis of Athens, Greece**



**Pavilion of Supreme Harmony in the Forbidden City, Beijing 1627**



# Elevated Base Plane



- Define as a **semiprivate space, singular space and volume**

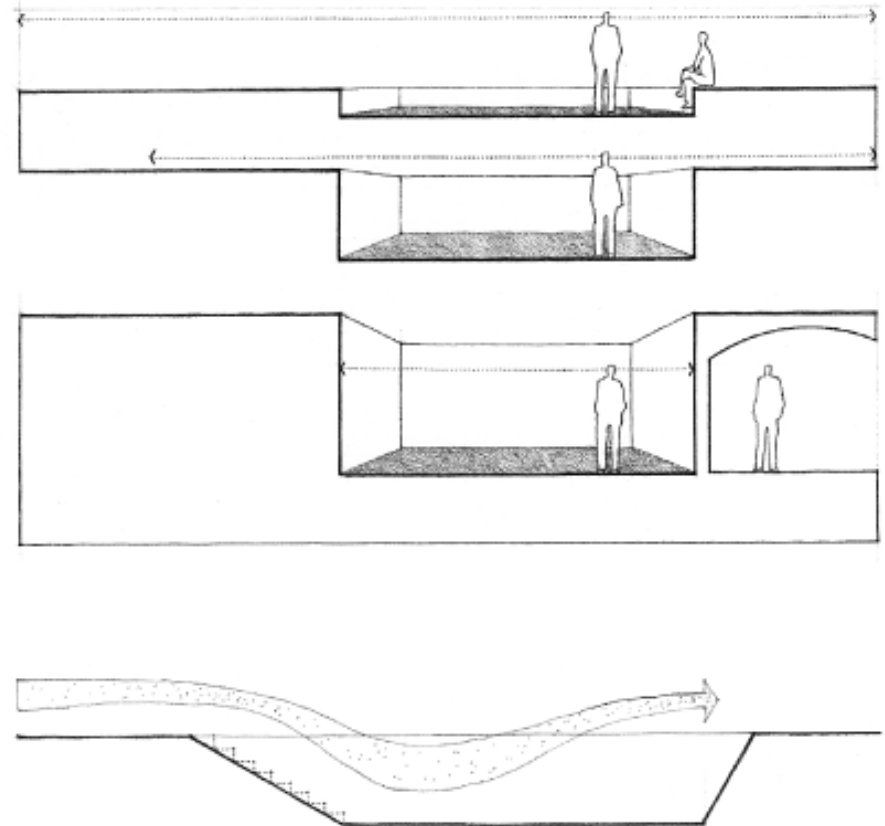
## House in Bay of Islands

Bay of Islands, New Zealand

Photographs: Patrick Reynolds

# Depressed Base Plane

- Shallow interruption remain an integral part interaction and surrounding environment connectivity
- Increase the depth of the depressed field weaken the visual and define a distinct volume
- Increase above eye level, the depressed space become a separate and distinct room



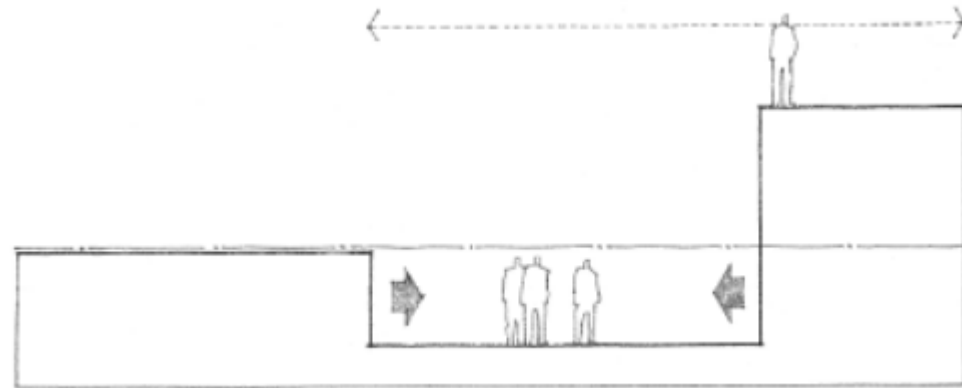


# Depressed Base Plane

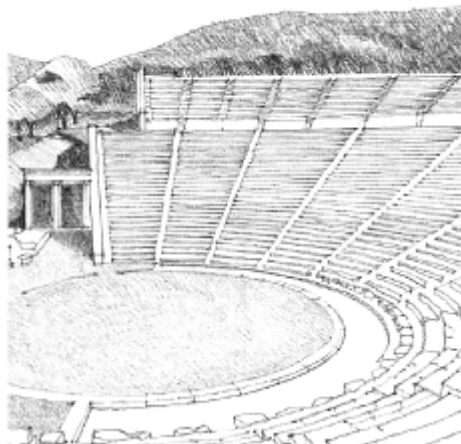


www.GreatBuildings.com

**Wolfsburg Cultural Center**, by Alvar Aalto, at Wolfsburg, Germany, 1958 to 1962



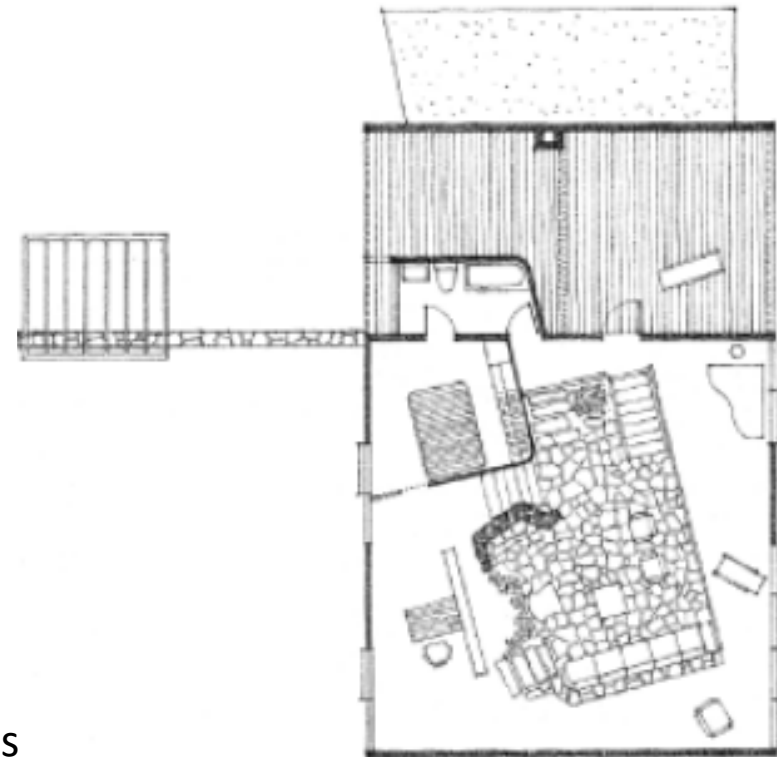
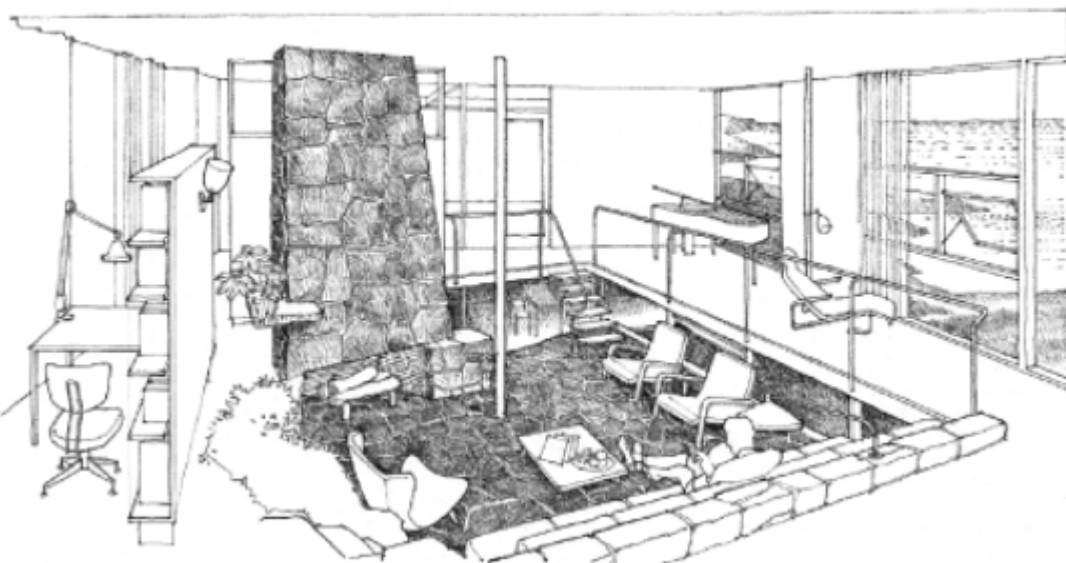
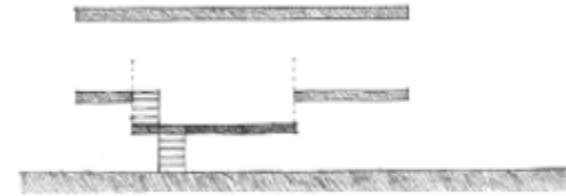
Protective qualities



Defines as space for outdoor, acoustic quality

# Depressed Base Plane

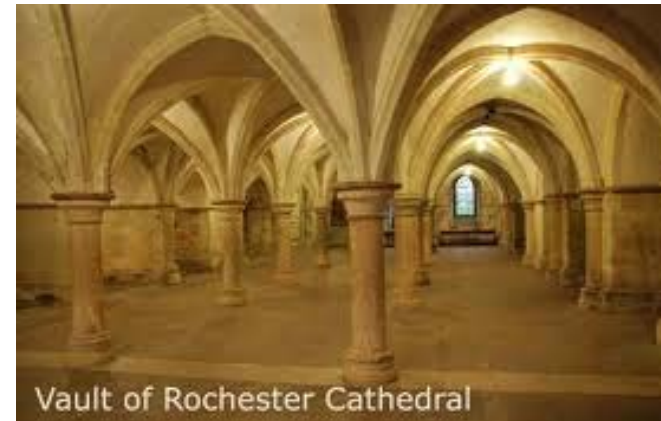
- Intermediate space to reduce the scale of room and define more intimate space
- The sunken area can also serve as a transitional space between two floor of a building



House on the Massachusetts Coast, 1948, Hugh Stubbins

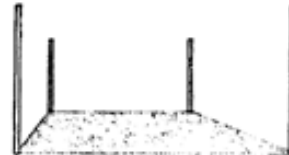
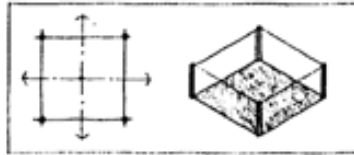
# Overhead Plane

- Defines field of volume
- If the columns or posts are used to support the overhead, they will aid in visually establishing the limits of the defined space
- Depressed/upgraded the field, the volume is visually reinforced



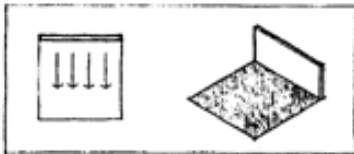
# 2.1.1. VERTICAL ELEMENTS

## VERTICAL LINEAR ELEMENTS



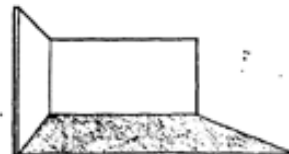
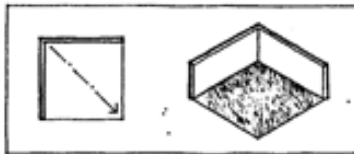
It defines the perpendicular edges of a volume of space

## SINGLE VERTICAL PLANE



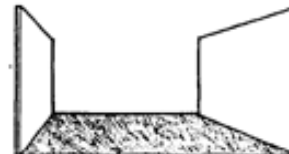
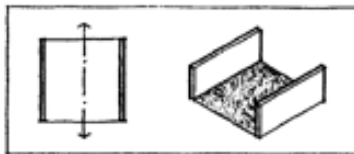
It articulates the space on which it fronts

## L-SHAPED PLANE



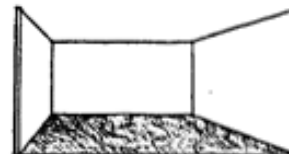
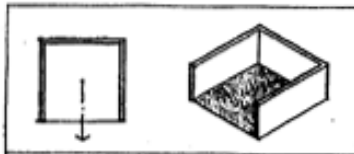
It generates a field of space from its corner outward along a diagonal axis.

## PARALLEL PLANES



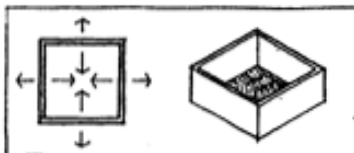
They define a volume of space between them toward both open ends.

## U-SHAPED PLANES



It defines a volume of space that is oriented toward the open end of the configuration

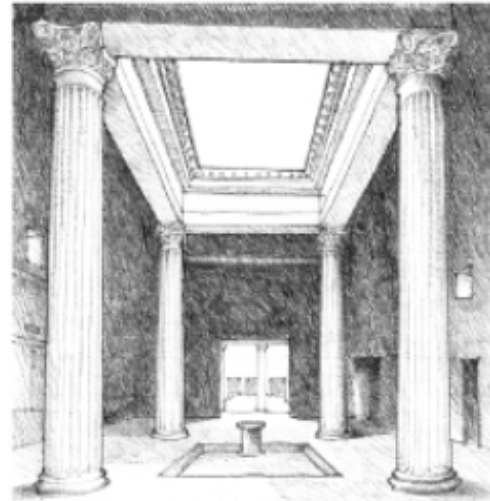
## FOUR PLANES: CLOSURE



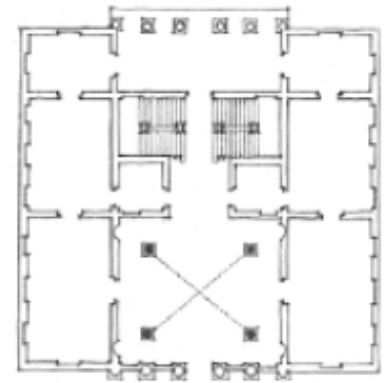
They establish the boundaries of an introverted space and influence the field of space around the enclosure

# Single Vertical Element

- Vertical linear element interact spatial field to the urban space along its edge



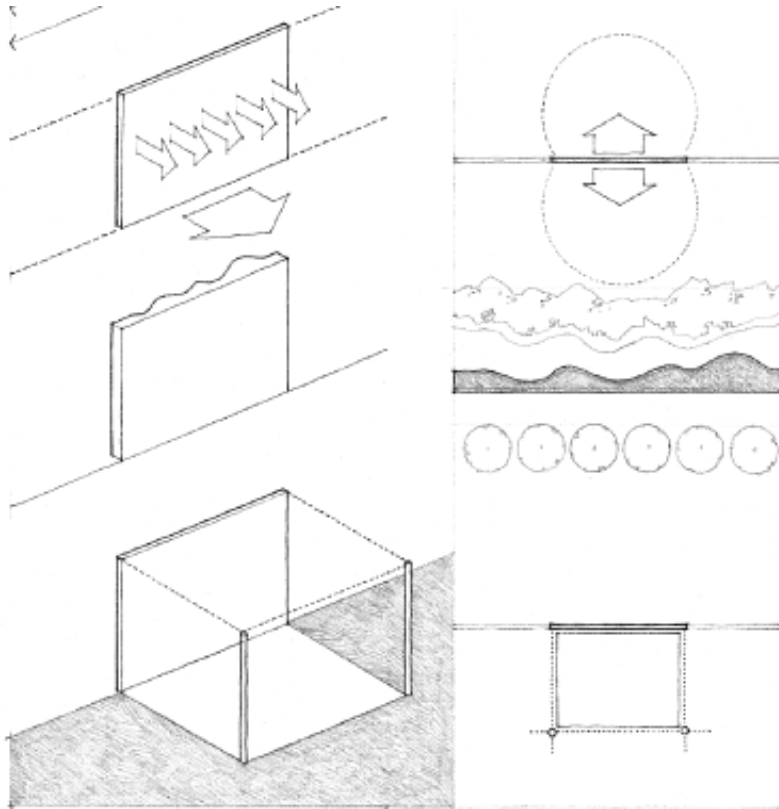
**Tetrastyle Atrium, House of the Silver Wedding,**  
Pompeii, 2nd century B.C.



**Palazzo Antonini, Udine, Italy, 1556,**  
Andrea Palladio

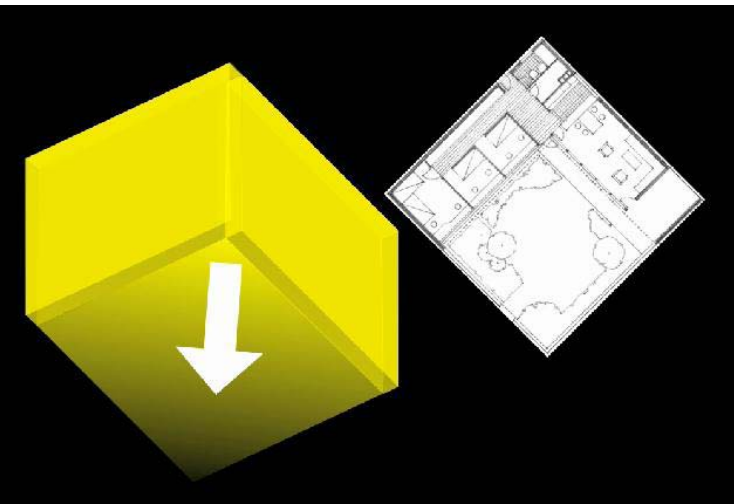
Piazza del Campo, Siena, Italy

# Single Vertical Plane



- Differentiate two fields
- Can be different in form, color, or texture to respond to different spatial conditions
- To define a volume, the single vertical plane need to interact with other elements/forms
- Height of a vertical plane defines different sense of enclosure
- Opening of a vertical plane could lead to define a specific orientation

# L-Shaped Planes

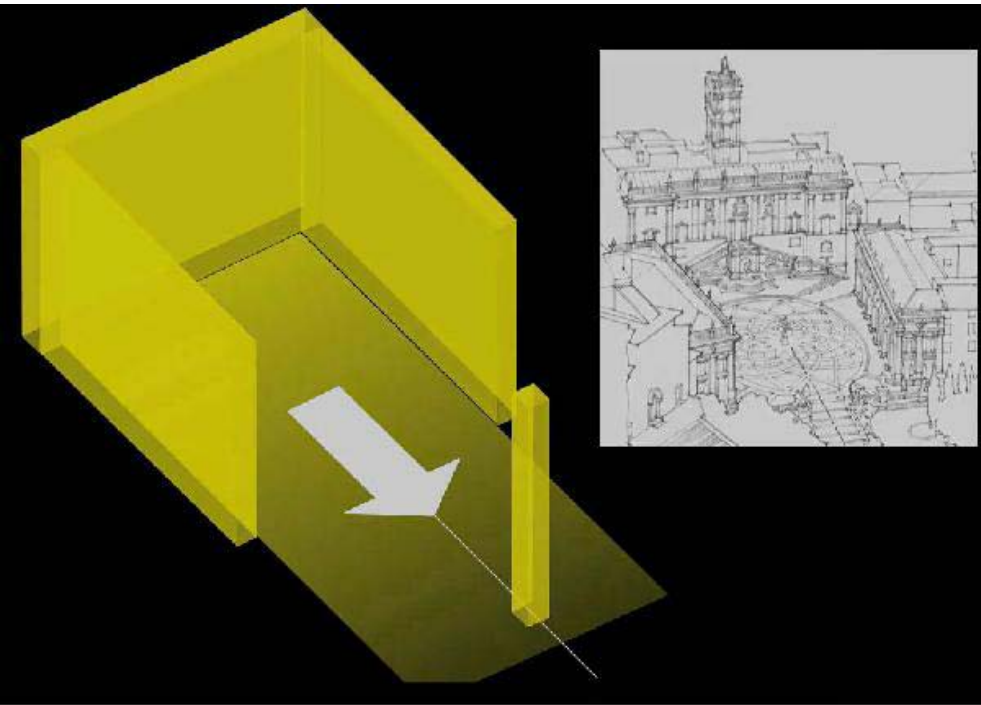


- generates a field of space from its corner outward along a diagonal axis. The enclosed introverted field at the interior corner becomes extroverted along its outer



# U-Shape Plane

- Four vertical planes encompassing a field of space is the strongest type of spatial definition in architecture. Because the field is completely enclosed, its space is naturally introverted.





# 2.1.1. OPENINGS

Openings in the enclosing planes of the spatial field provide continuity with adjacent spaces.

## **OPENINGS** **WITHIN PLANES**

an opening located within a wall or a ceiling plane appears like a figure against the background



CENTERED



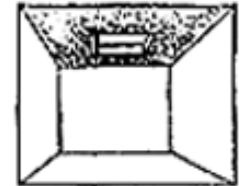
OFF-CENTER



GROUPED



DEEP-SET



SKYLIGHT

## **OPENINGS** **AT CORNERS**

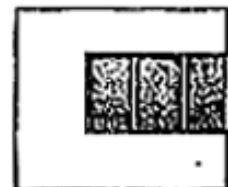
Openings located at corners give a diagonal orientation to the space and the planes in which they are located



ALONG ONE EDGE



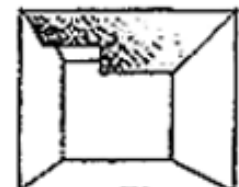
ALONG TWO EDGES



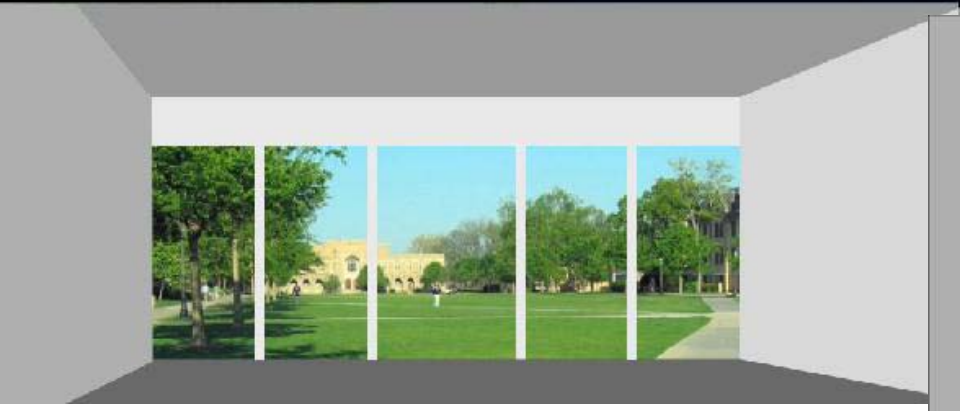
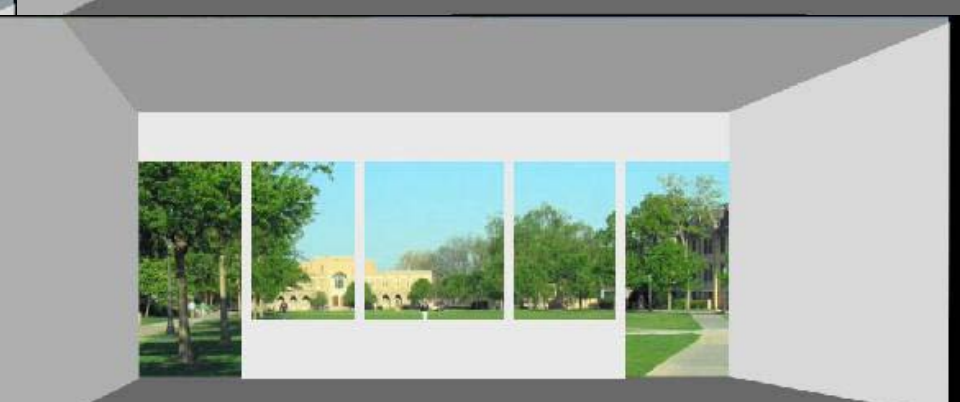
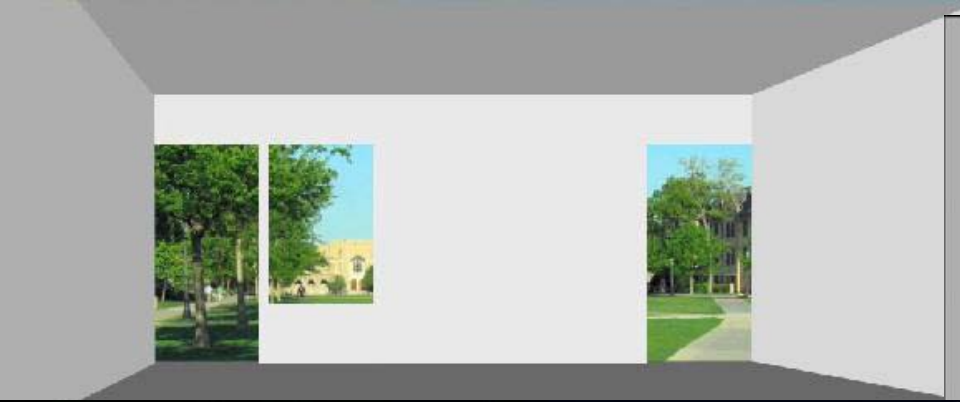
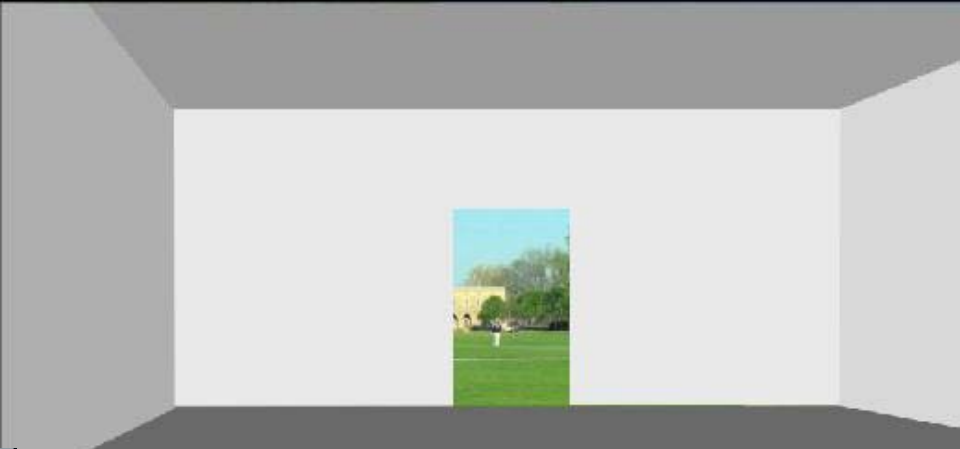
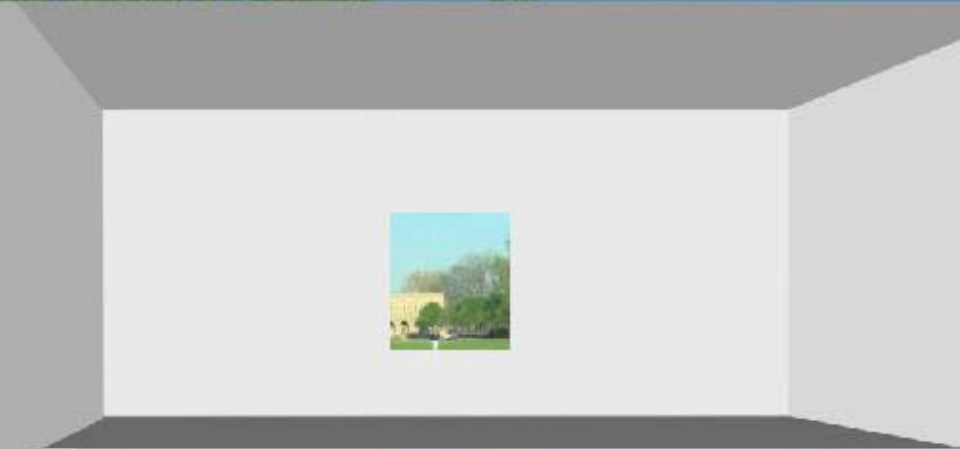
TURNING A CORNER



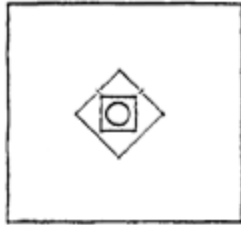
GROUPED



SKYLIGHT

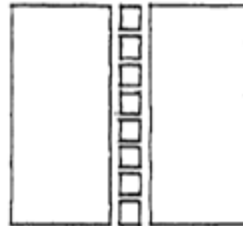


# 2.3. ORGANIZING PRINCIPLES AND COMMON SPATIAL CONFIGURATIONS



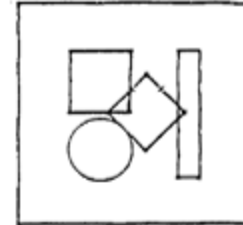
## **CENTRALIZED**

A central dominant space about which other secondary spaces are grouped



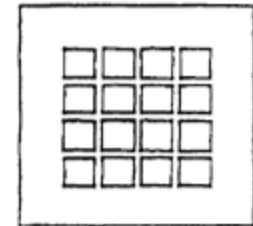
## **LINEAR**

A linear sequence of repetitive spaces



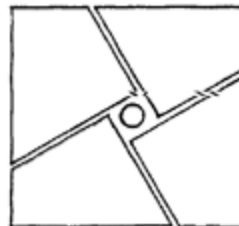
## **CLUSTERED**

Spaces grouped by proximity or the sharing of a common visual trait or relationship



## **GRID**

Spaces organized within the field of a structural grid or another 3 dimensional framework

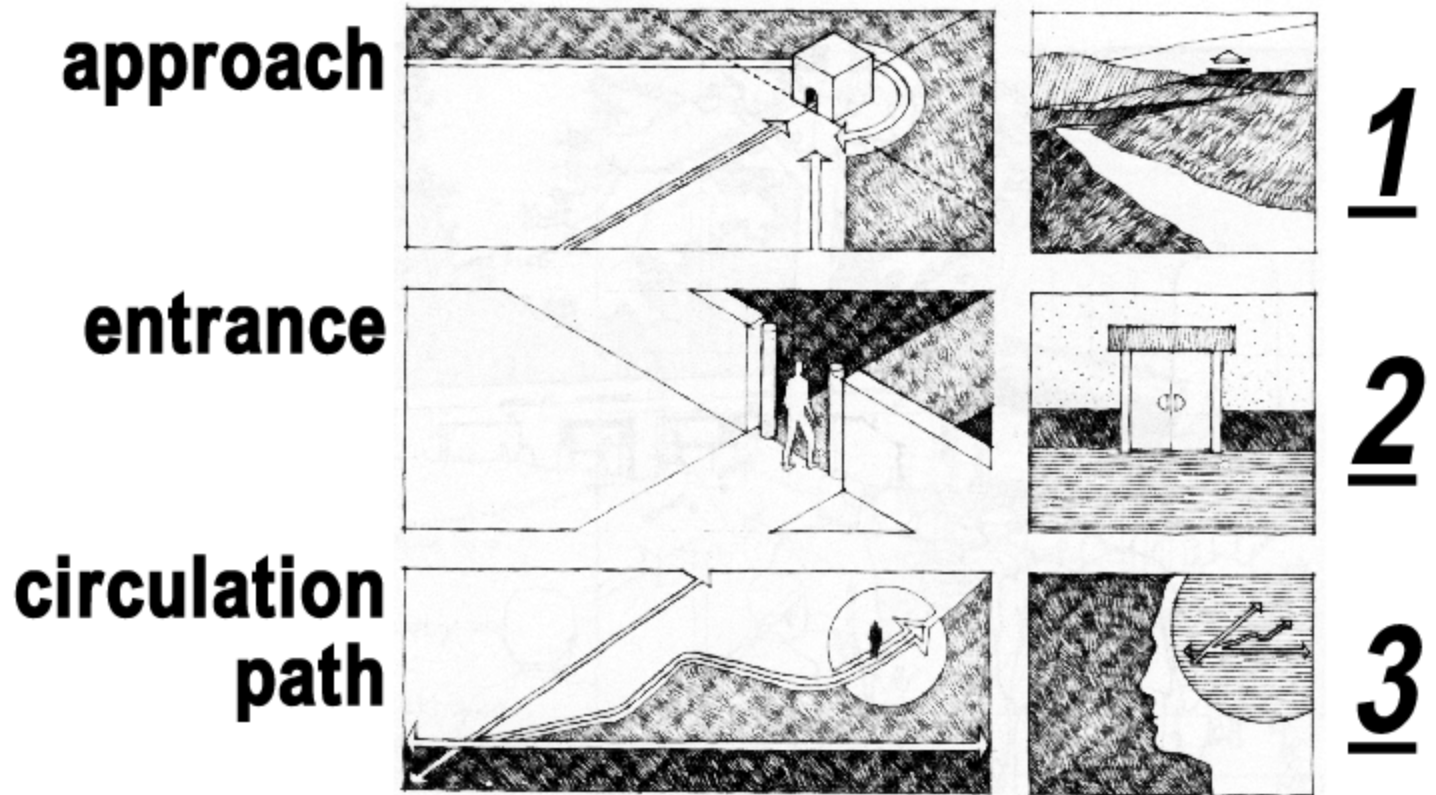


## **RADIAL**

A central space from which linear organizations of space extent in a radial manner

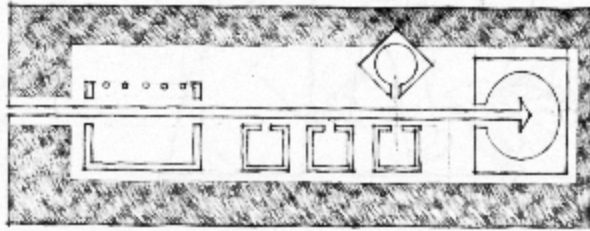
# 2.4. SEQUENTIAL EXPERIENCE

Circulation helps to organize spaces and at the same time has a great impact as a formative idea. Elements of circulation are:



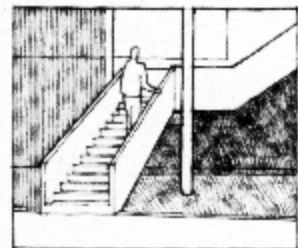
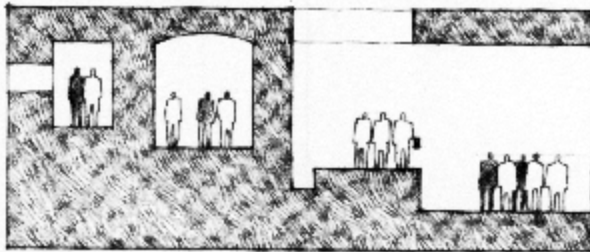
Circulation helps to organize spaces and at the same time has a great impact as a formative idea.  
Elements of circulation are:

**path/space  
relationship**



**4**

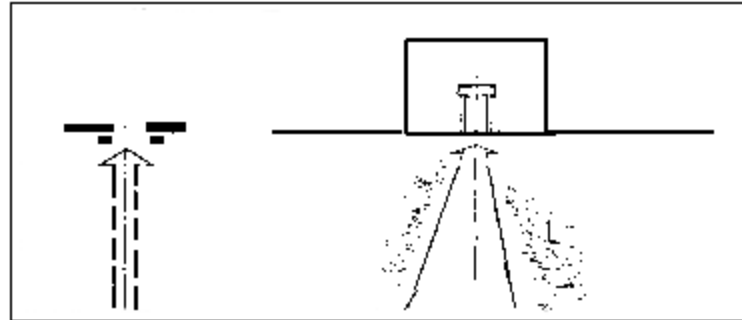
**form of  
path**



**5**

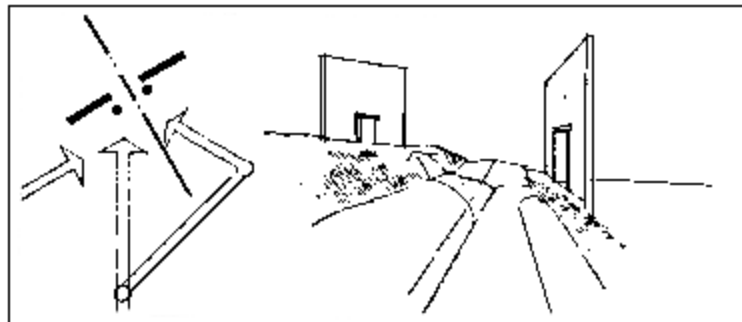
# 2.4.1. APPROACH

frontal approach



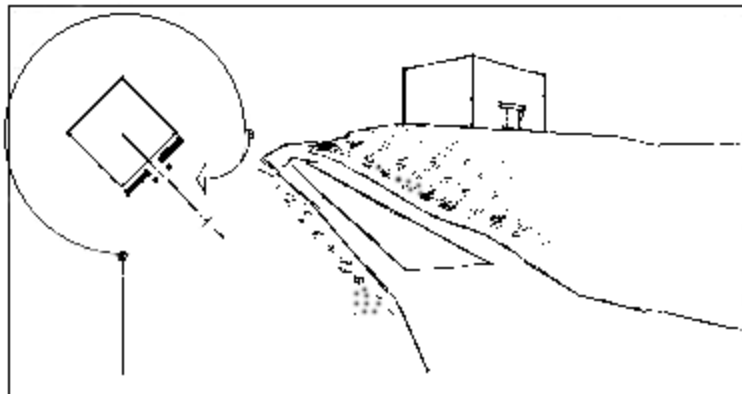
It follows a straight axial path.  
It emphasizes the front view.

oblique approach



Its path is re-directed to delay and prolong the sequence of approach.  
It emphasizes the effect of perspective.

spiral approach



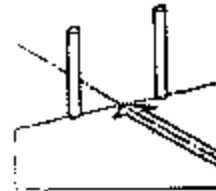
It follows a path around the building.  
It emphasizes the three dimensional form of a building.

# 2.4.2. ENTRANCE

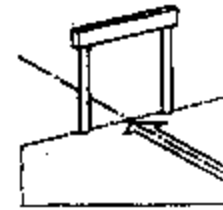
Designing an entrance can be done in more subtle ways than punching a hole in a wall:



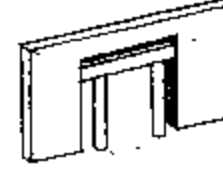
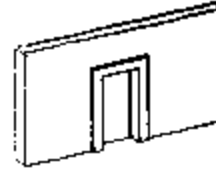
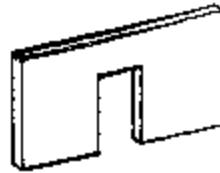
change of level



two pillars



an overhead beam



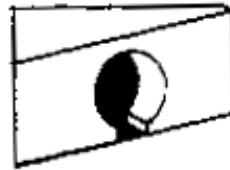
from a simple opening to an elaborate gateway



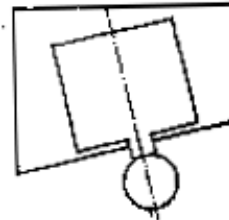
regardless of the form of the entrance, it is best signified if perpendicular to the path of the approach

# 2.4.2. ENTRANCE

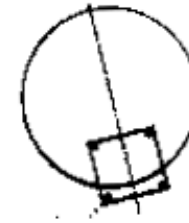
entrances can be:



flush



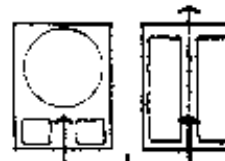
projected



recessed



centered



off-center



creating its own symmetrical condition

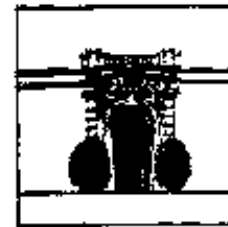
Entrances can be visually reinforced by:



a lower, wider, narrower opening



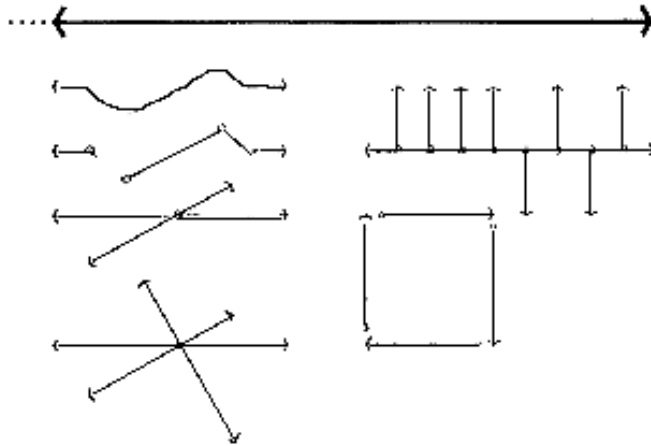
extra-deep



with ornamentation

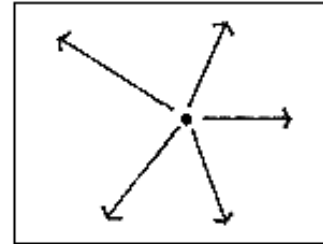


# 2.4.3. CIRCULATION PATHS

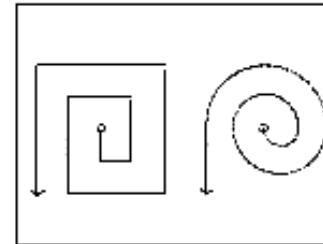


## 1. LINEAR

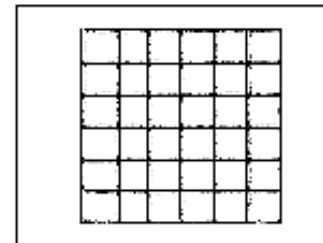
All paths are linear. A straight path, however, can be the primary organizing element for a series of spaces.



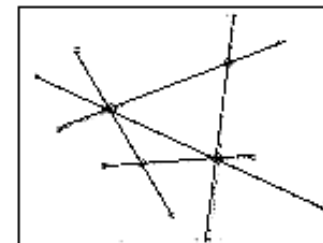
## 2. RADIAL



## 3. SPIRAL



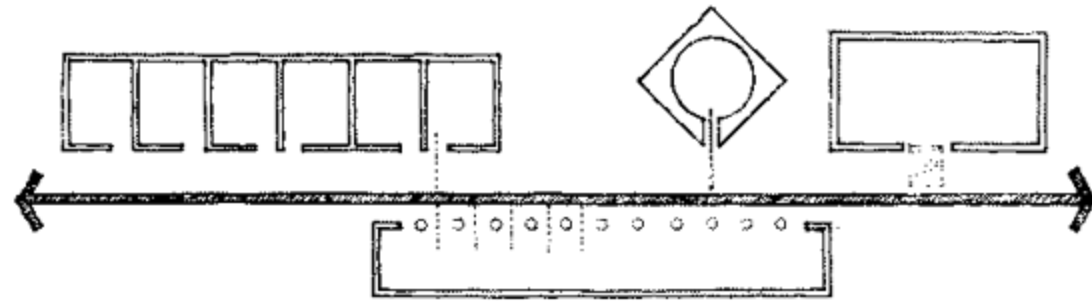
## 4. GRID



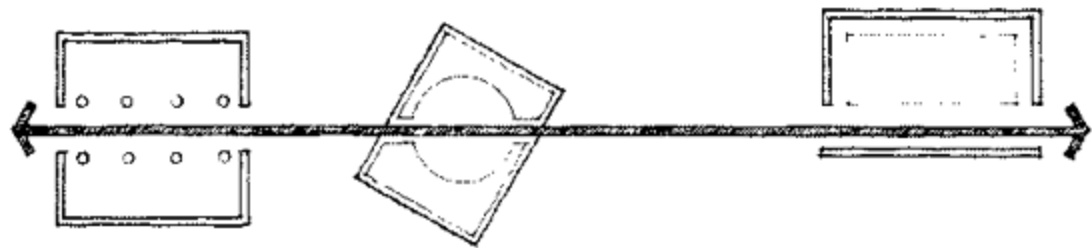
## 5. NETWORK

# 2.4.4. PATH-SPACE RELATIONSHIPS

Paths may be related to spaces they link in the following ways:



1. Pass by spaces



2. Pass through spaces



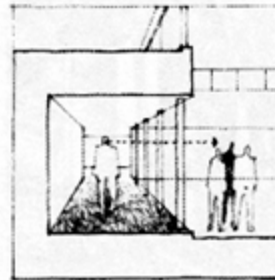
3. Terminate in a space

# 2.4.5. FORM OF CIRCULATION SPACE

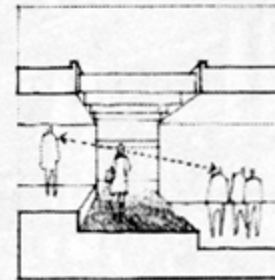
A circulation space may be:



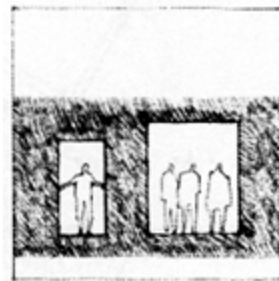
enclosed



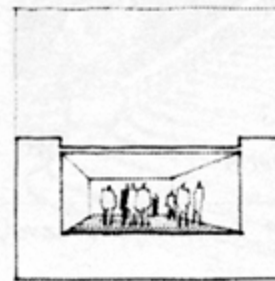
open on one side



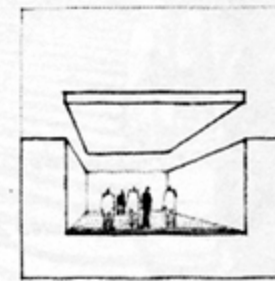
open on both sides



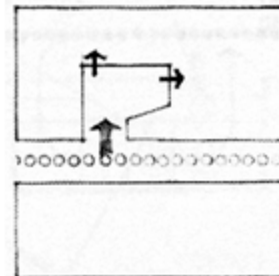
narrow



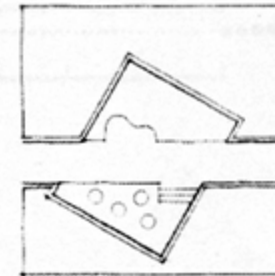
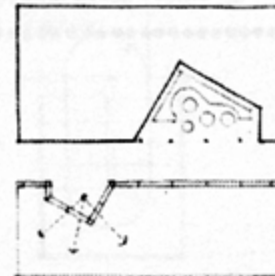
wide



fostering pause, rest, or viewing



it can be enlarged merging with spaces it passes through



# References

- *Architecture: Form, Space & Order*, Francis Ching, ISBN 0-442-21535-5
- *Elements of Architecture*, Pierre Von Meiss, ISBN 0-747-60014-7
- *Elements of Architectural Design*, Ernest Burden, ISBN 0-442-01339-6
- *Principles of Form and Design*, Wucius Wong, ISBN 0-442-01405-8