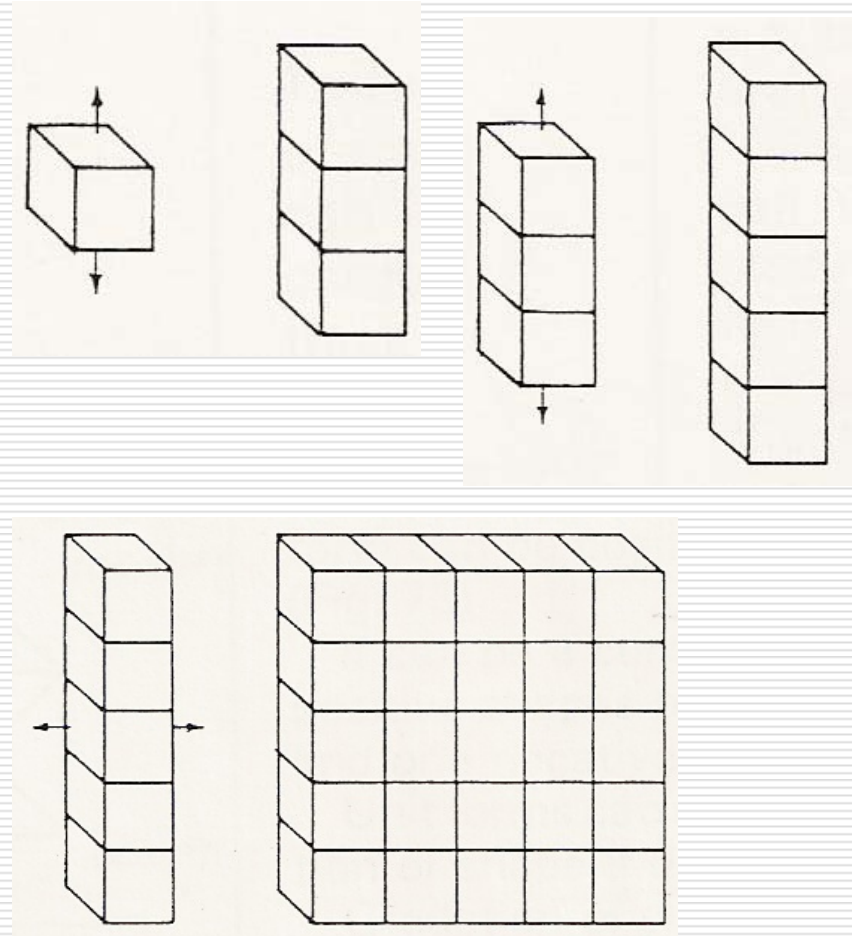

DESIGN ASPECTS 2

Chapter 3: Wall Structures

Dr. Hatem Galal A Ibrahim

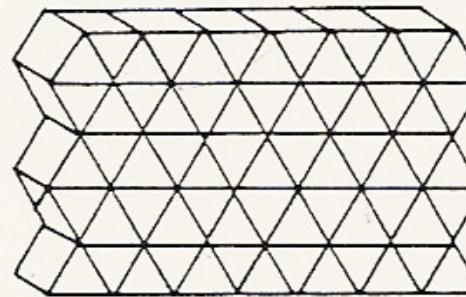
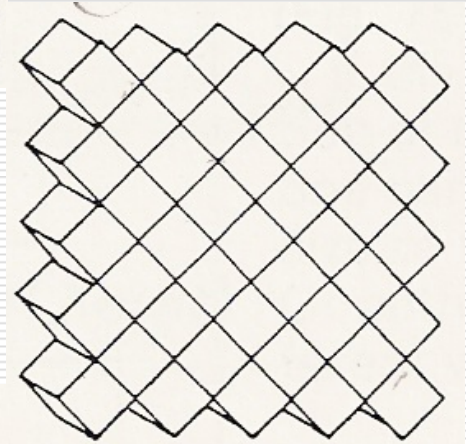
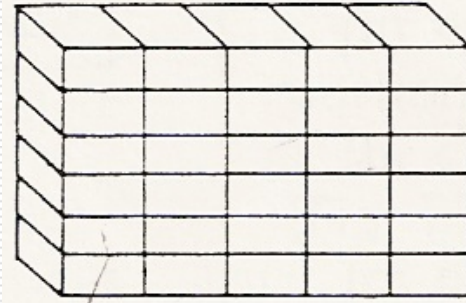
Cube, Column and Wall

- ❑ Stacking cubes => a Column
- ❑ 3cube column may be Extended in either directions to include more cubes
- ❑ Column repeated left and right => Wall
- ❑ A Cube is a SPACTIAL CELL in a wall (arranged in 2D on a frontal plane)



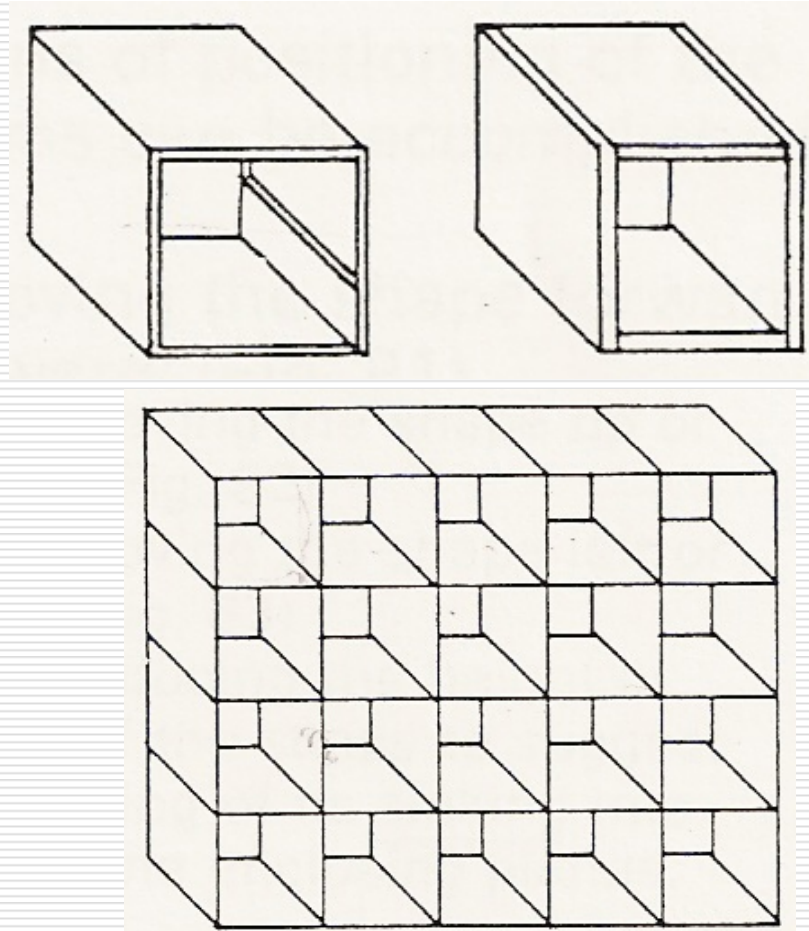
Cube, Column and Wall

- All formal 2D structures **can become** wall structures with the addition of some depth,
- and their structural sub-divisions **can be made into** spatial cells



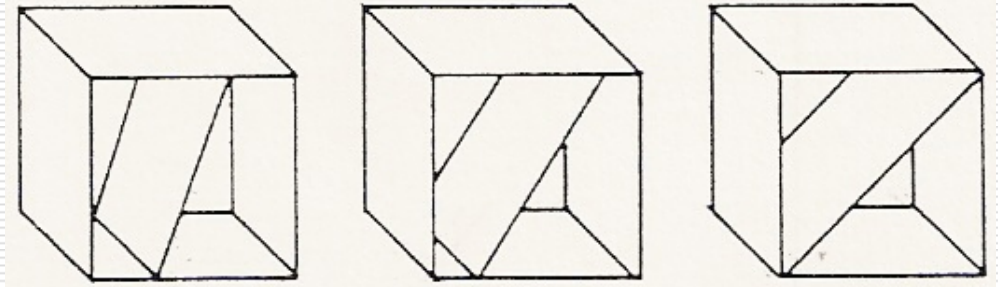
Spatial Cells & Unit Forms

- ❑ To explore the various possibilities of making wall structures, let's make the simple spatial cell: a cube
- ❑ by bending thin cardboard or gluing 4 pieces of thick cardboard



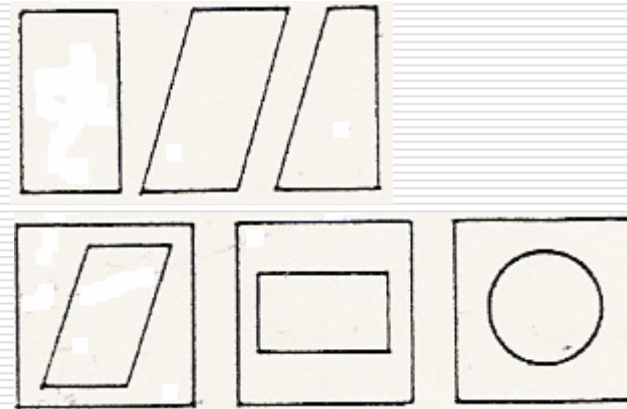
Spatial Cells & Unit Forms

- ❑ We can place a UNIT FORM inside of this SPATIAL CELL
- ❑ The UNIT FORM can be as simple as a flat plane used repetitively or with slight variations



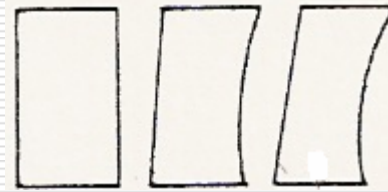
Spatial Cells & Unit Forms

- As a planar shape, the Unit Form can be:
 - Positive
 - Or Negative
- It can be a Combination:
 - Of 2 Positive shapes
 - Or 1 positive and 1 negative

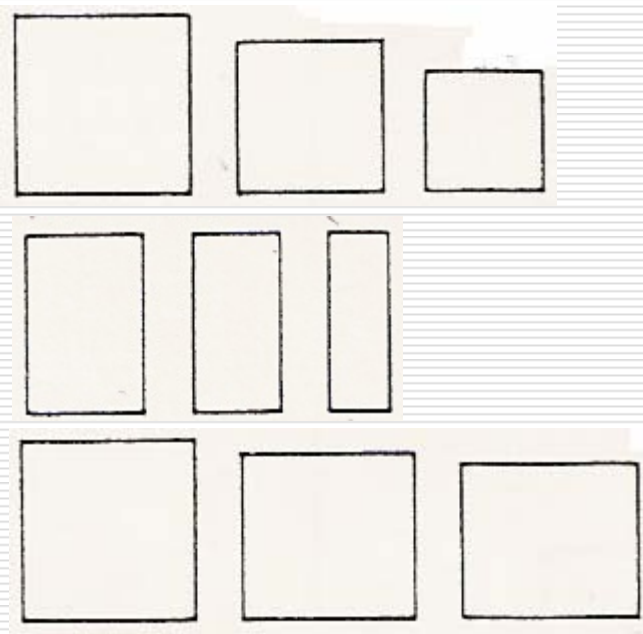


Spatial Cells & Unit Forms

- Unit Forms can be used in Gradation of Shape

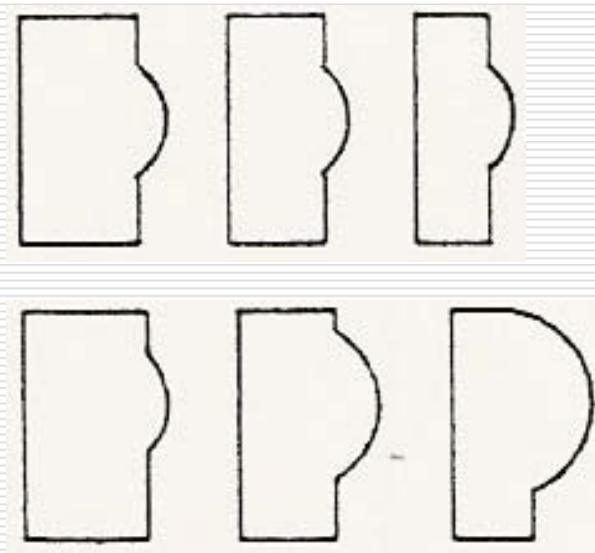


- Gradation of Size can be effected by:
 - Enlarging or reducing proportionately
 - Changing of width only
 - Changing of height only



Spatial Cells & Unit Forms

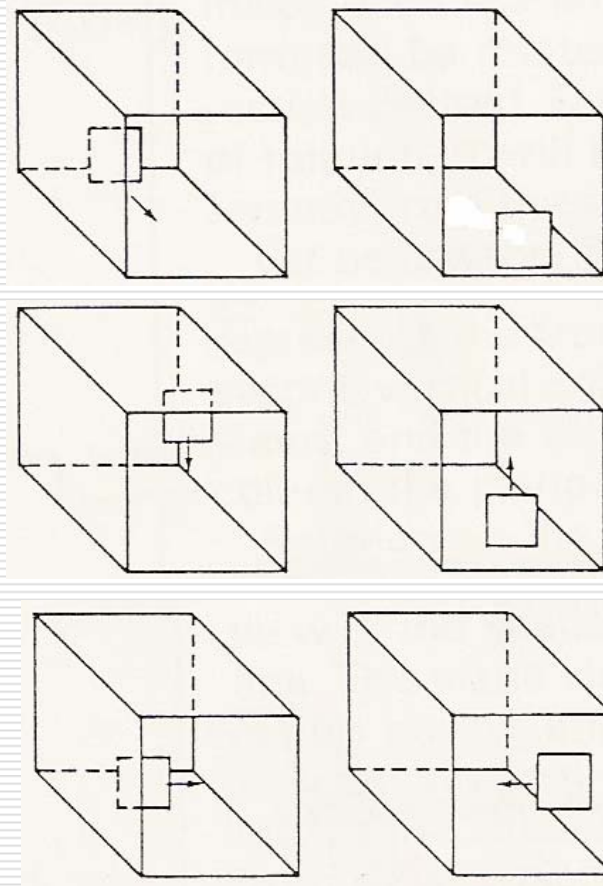
- If Unit Form is a Combination of 2 smaller shapes:
 - Size of one can be kept constant while size of the other varies
 - Or both shapes can vary in different ways



Positional Variations of Unit Forms

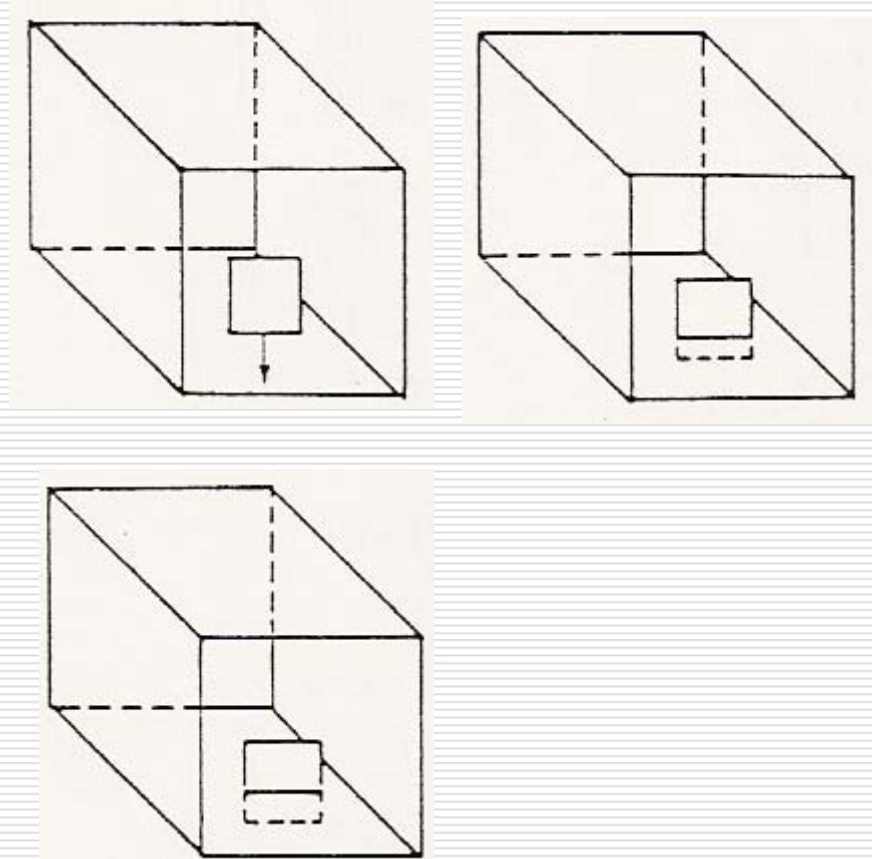
□ Variations of positioning of the Unit Forms can be accomplished by:

1. Moving the shape Forward or Backward
2. Moving the shape up or down
3. Moving the shape left or right



Positional Variations of Unit Forms

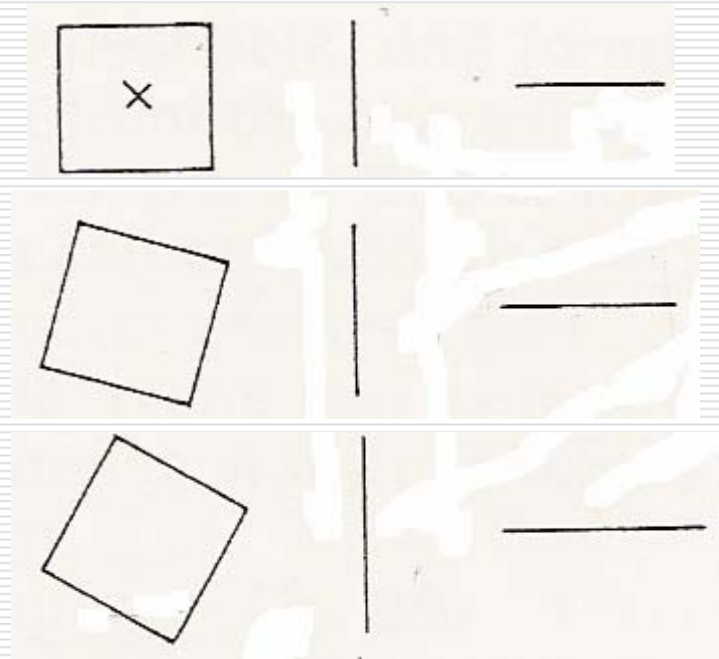
4. Reducing the height or width of the shape to suggest the feeling of its Sinking into one of the enclosing planes



Directional Variations of Unit Forms

- ❑ Inside each Spatial Cell the Unit Form can be:
- ❑ Rotated in any direction=> thus seen differently in each step of rotation

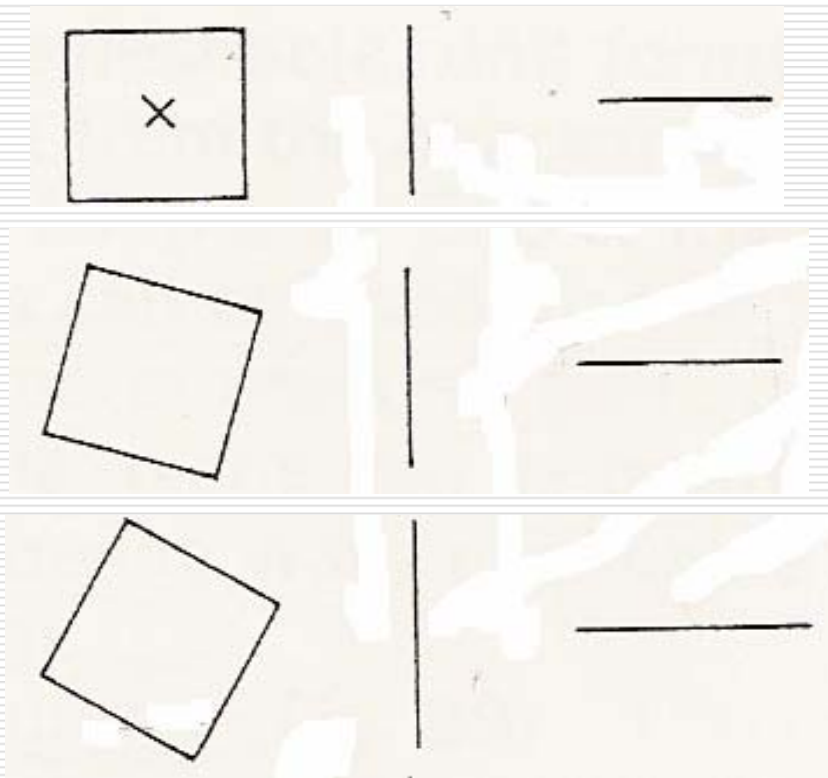
Front View Side View Plane View



Directional Variations of Unit Forms: Rotation on the Shape's Own Plane

- Rotation on the Shape's Own Plane:
 - No change in the front view
 - Side view always a Line
 - Plane view always a Line

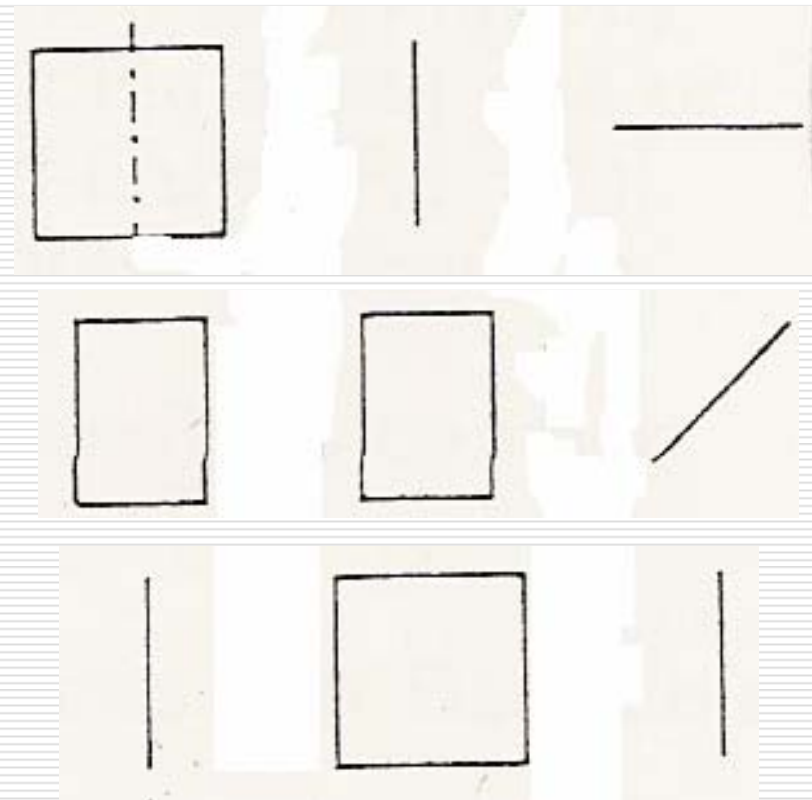
Front View Side View Plane View



Directional Variations of Unit Forms: Rotation Along A Vertical Axis

- Rotation Along A Vertical Axis :
 - Front view: Square => narrower to a Line
 - Side view: Line => Square
 - Plane view: Shape remains a line with constant length and variable direction

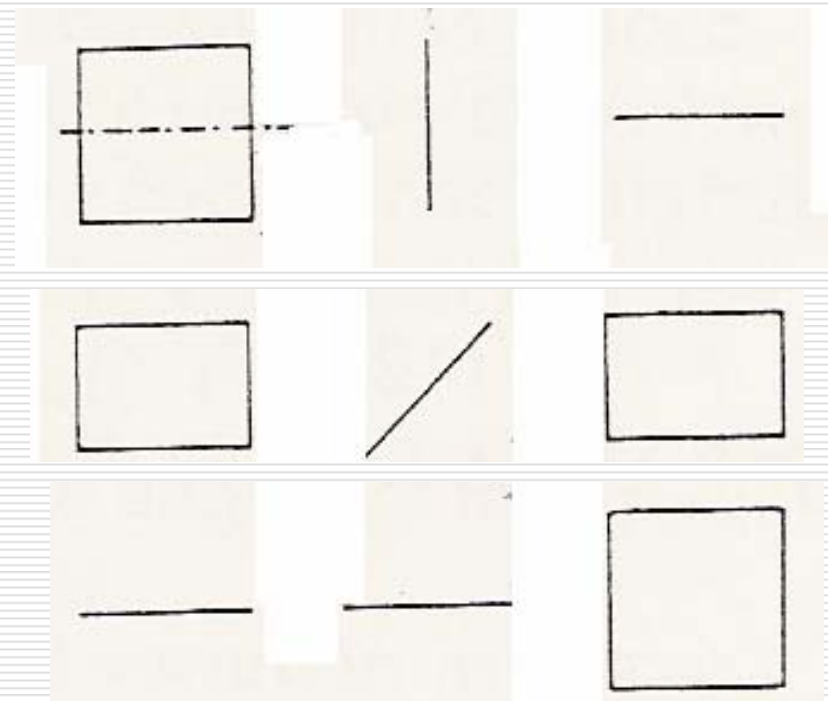
Front View Side View Plane View



Directional Variations of Unit Forms: Rotation Along A Horizontal Axis

- Rotation Along A Horizontal Axis :
 - Front view: Square
=> shorter to a Line
 - Side view: Shape remains a line with constant length and variable direction
 - Plane view: Line
=> Square

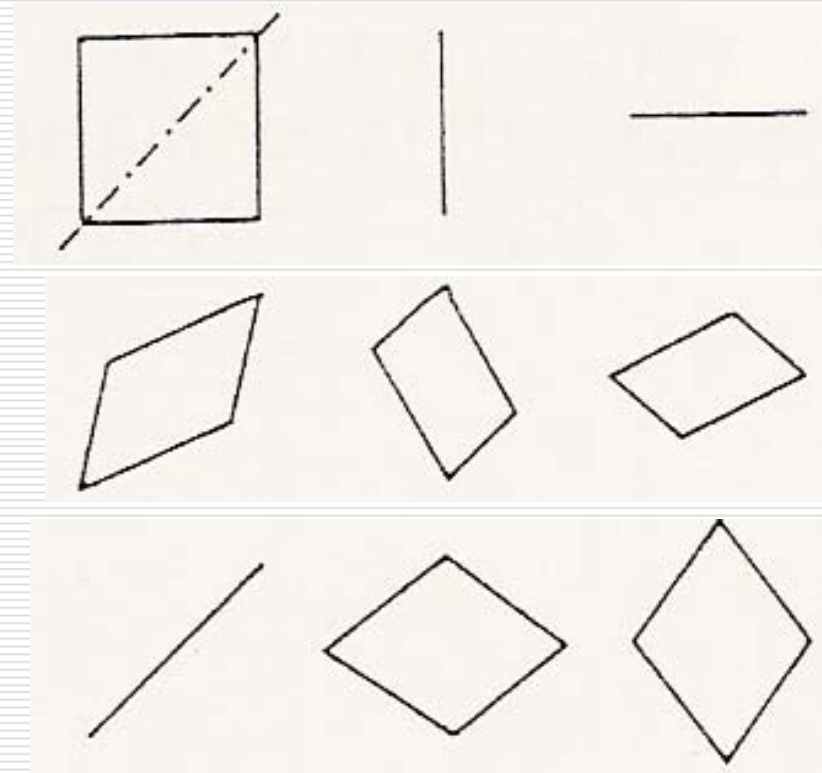
Front View Side View Plane View



Directional Variations of Unit Forms: Rotation Along A Diagonal Axis

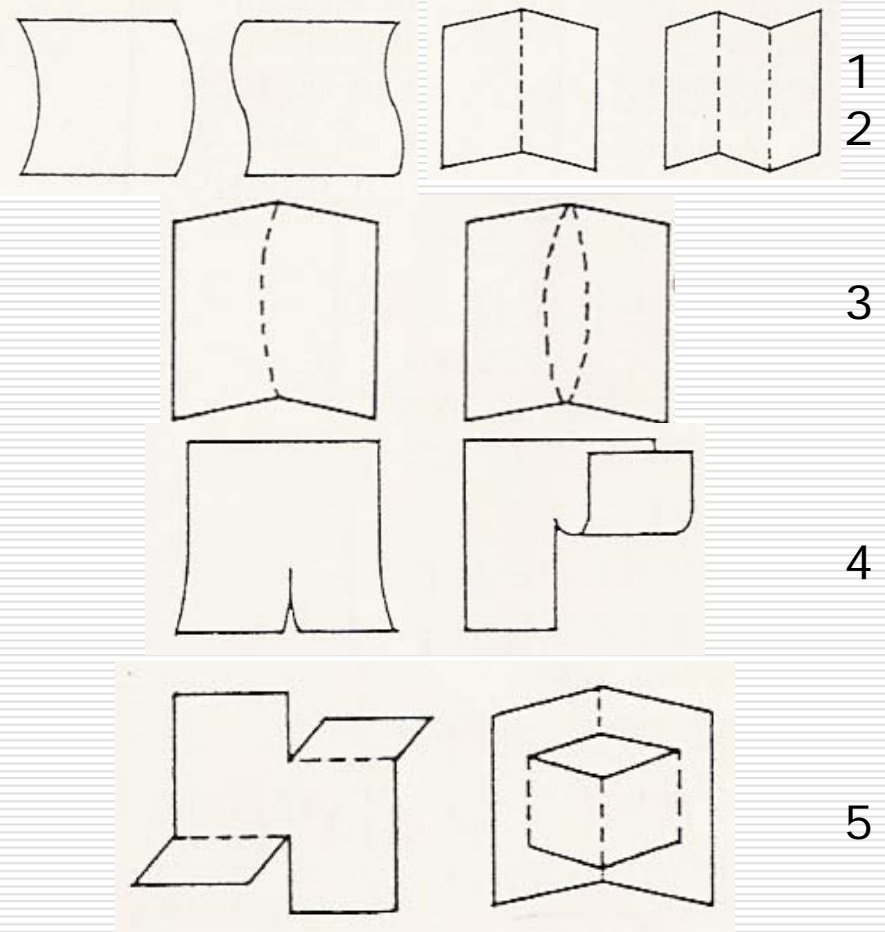
- Rotation Along A Diagonal Axis :
 - Front view: Square
=> Parallelograms
=> a Line
 - Side view: Line
=> Parallelograms
 - Plane view: Line
=> Parallelograms

Front View Side View Plane View



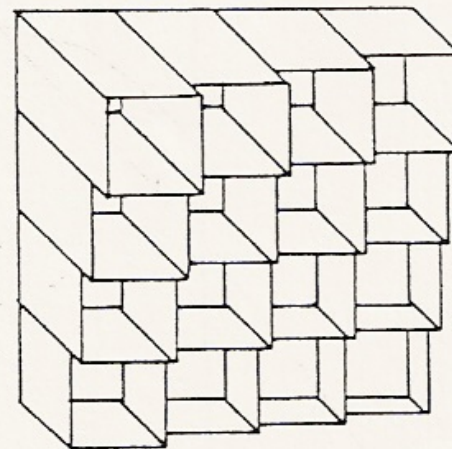
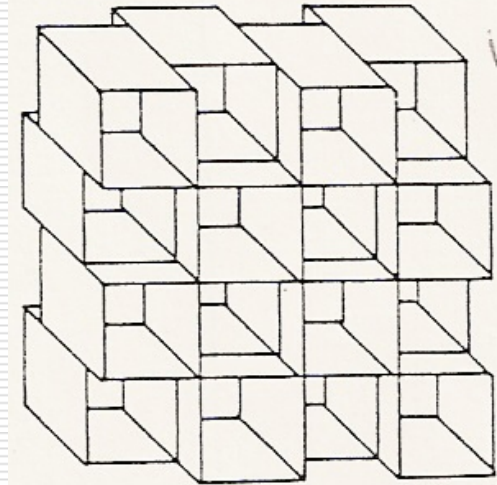
Unit Forms As Distorted Planes

- Using complicated Unit Form => greater 3D effects
- Thus use 2 or more Flat Planes => produce complex Unit Form
- Or treat a Flat Plane by:
 1. Curling
 2. Bending
 3. Bending along one or more curved lines
 4. Cutting & Curling
 5. Cutting & Bending



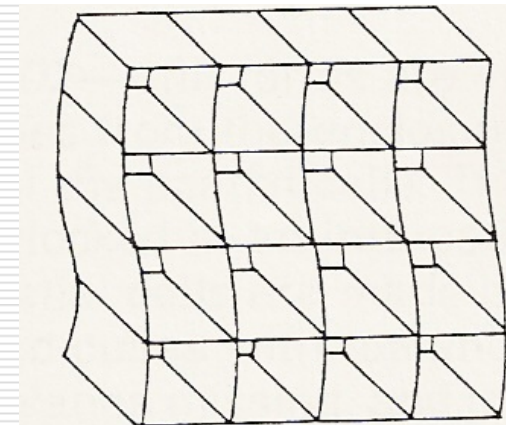
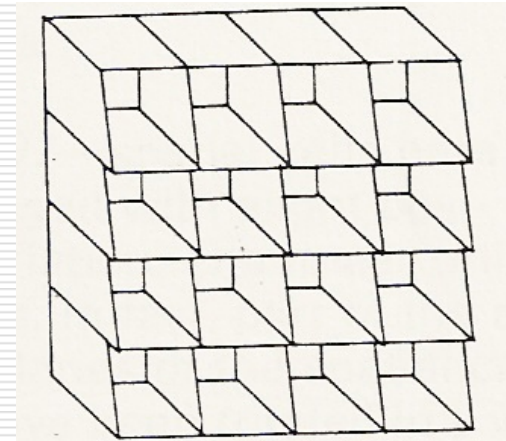
Wall Structures Not Remaining Flat

- ❑ Adding Positional Variations among Spatial Cells => more 3D
- ❑ Varying the Depth of Spatial Structures => same effect
- ❑ Directional Variations possible but with care as the side planes of Spatial Cells may become too prominent



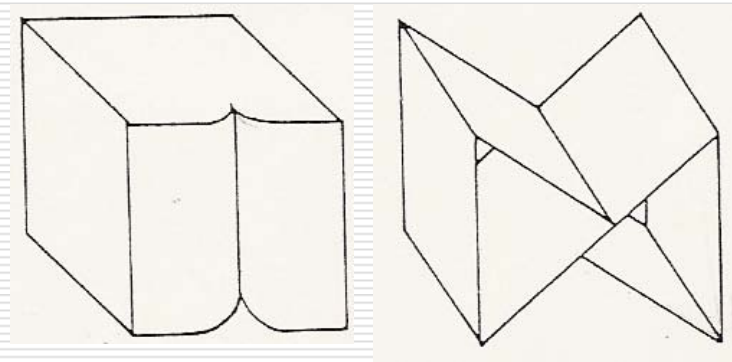
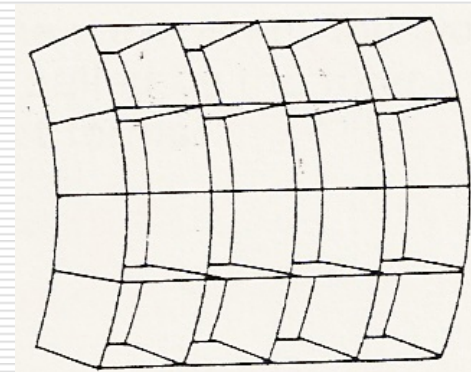
Modification of Spatial Cells

- ❑ Why? To achieve greater 3D quality
- ❑ Some Front edges of Spatial Cells are no more perpendicular to the base
- ❑ Straight edges => Curved edges



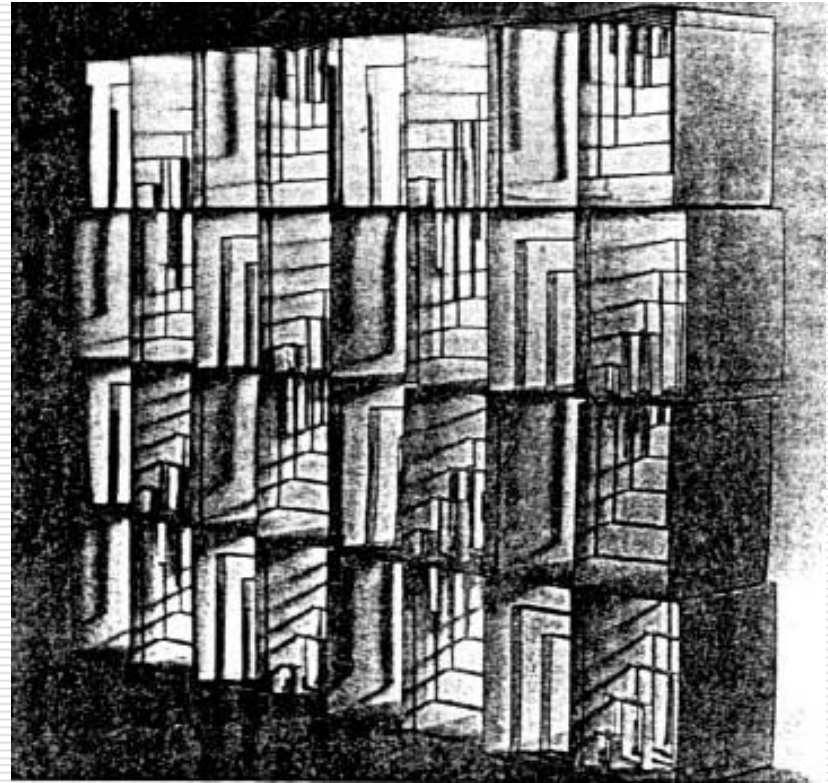
Modification of Spatial Cells

- ❑ Enclosing planes of the Spatial Cells are not at right angles to one another
- ❑ Spatial Cells designed as part of the Unit Form structure
- ❑ Spatial Cells can become the Unit Form or we can have Unit Forms to erect a Wall Structure without the use of Spatial Cells



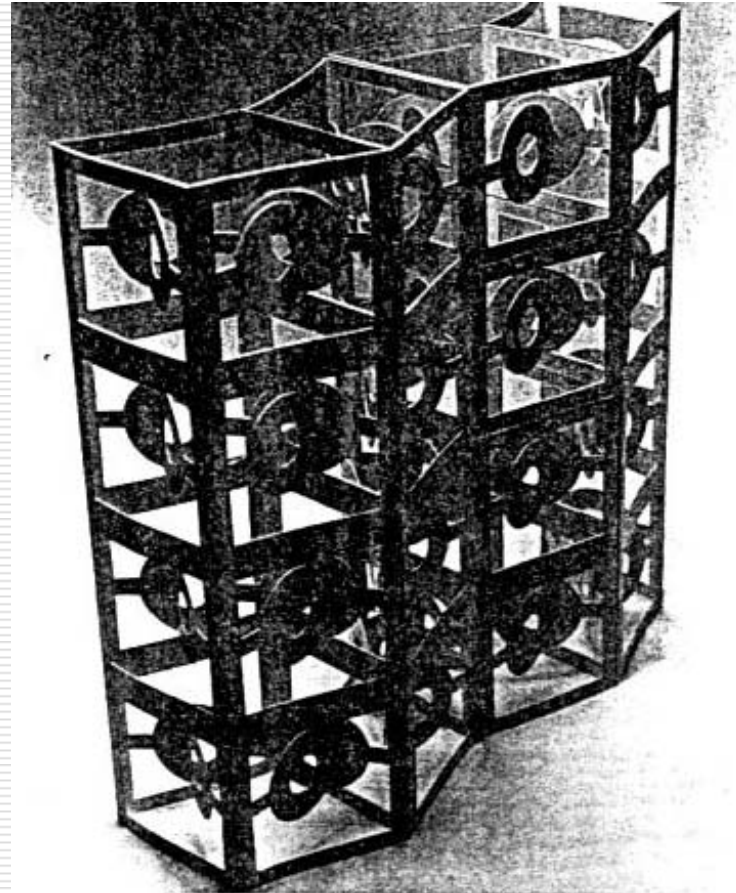
Wall Structures: Examples

- Spatial Cells arranged with slight Positional Variation



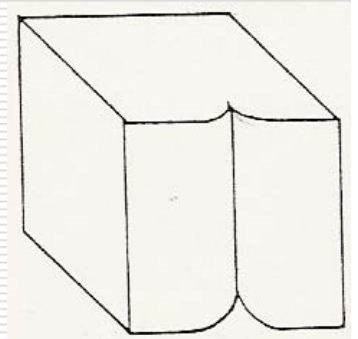
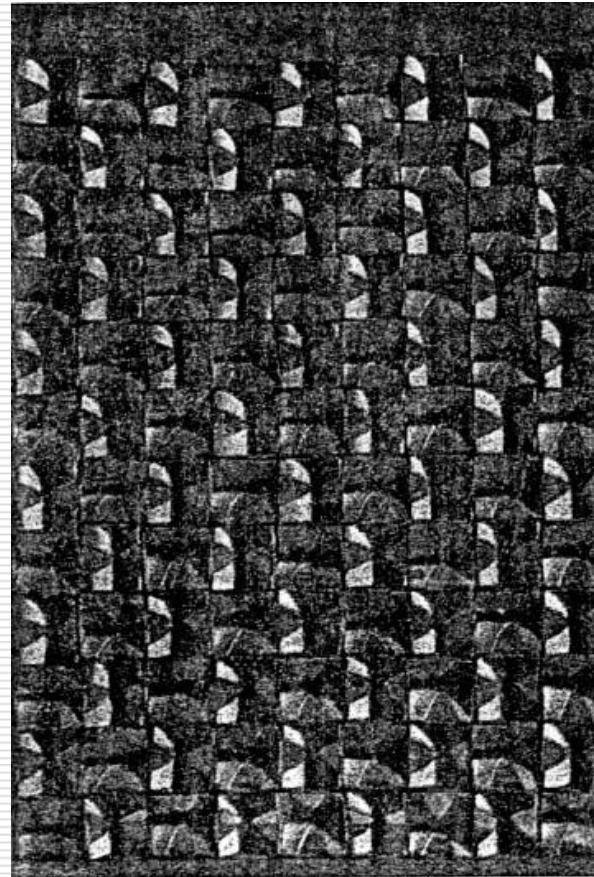
Wall Structures: Examples

- ❑ Unit Forms are cut-out shapes from the enclosing planes of the Spatial Cells
- ❑ Spatial Cells are cardboard cubes with top and bottom missing



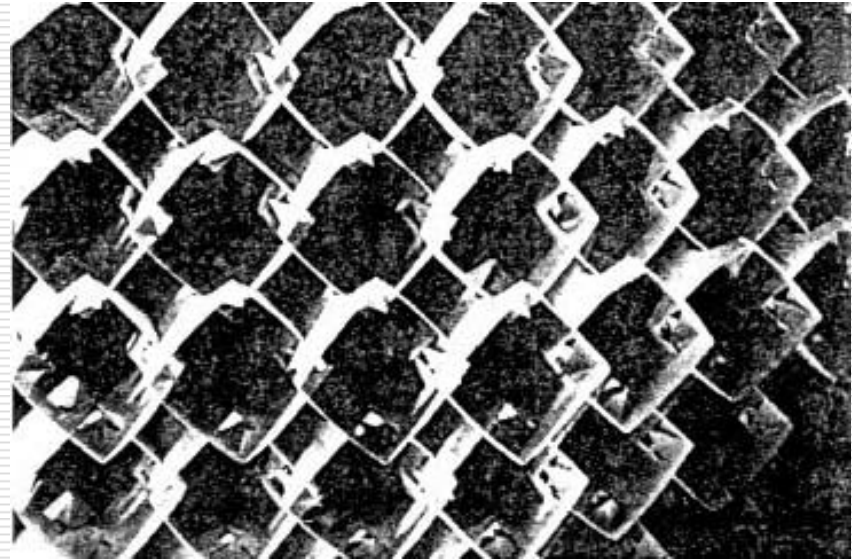
Wall Structures: Examples

- ❑ Spacial Cells are constructed in way much like the one on the right
- ❑ The result gives a Tactile feeling of texture



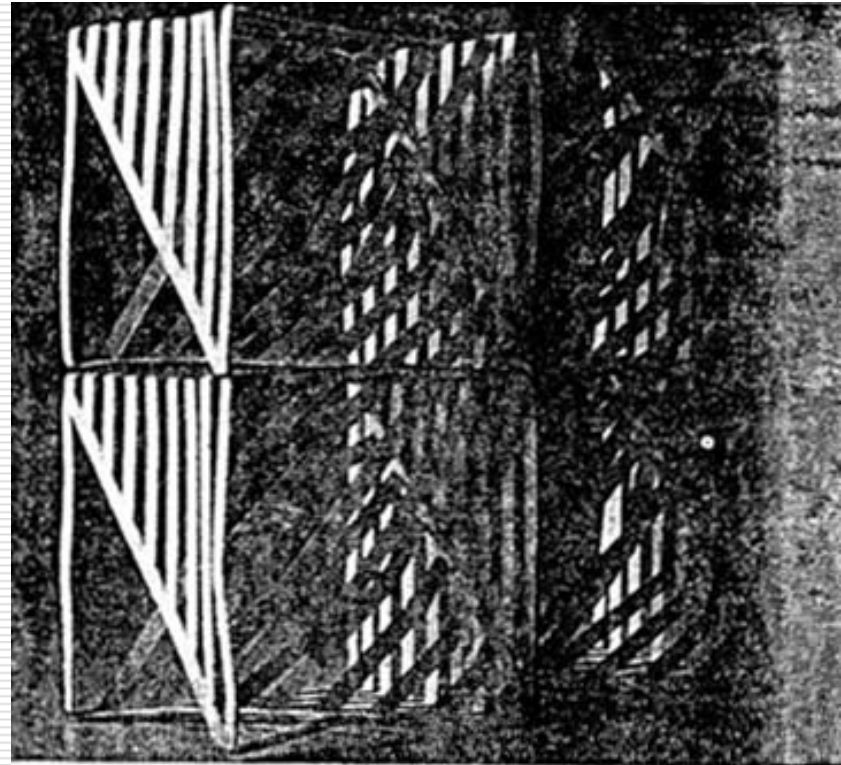
Wall Structures: Examples

- ❑ Interpenetrating Spatial Cells with some Positional Variations
- ❑ No separate Unit Form is introduced in the Spatial Cells



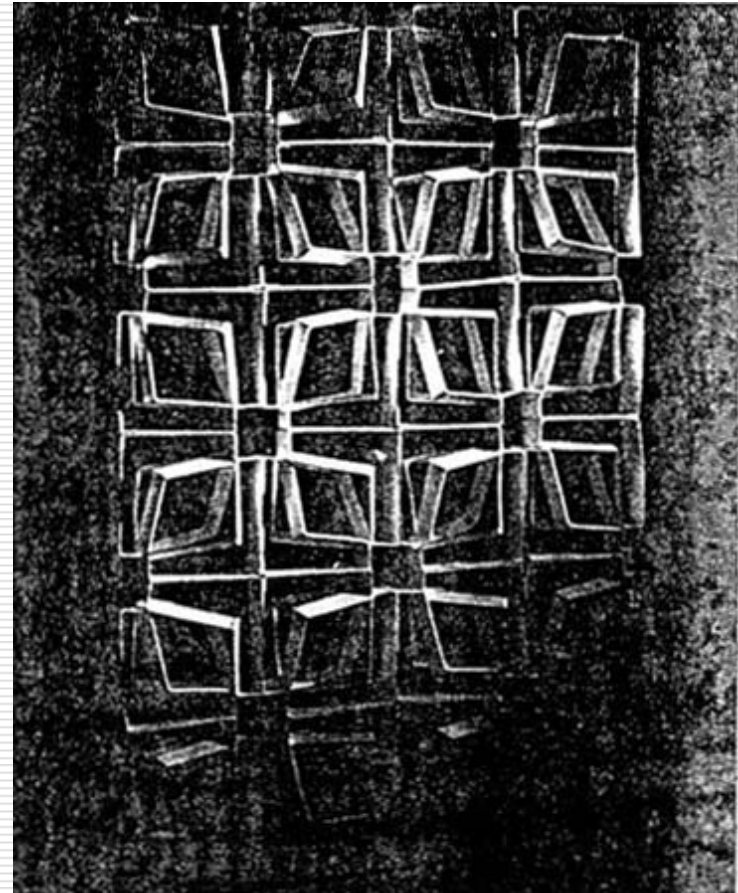
Wall Structures: Examples

- ❑ Unit Forms are stripes cut and folded inward from the side planes of Spatial Cells
- ❑ Some parts of the side planes have been removed
- ❑ The whole design has a transparent effect with delicate linear elements



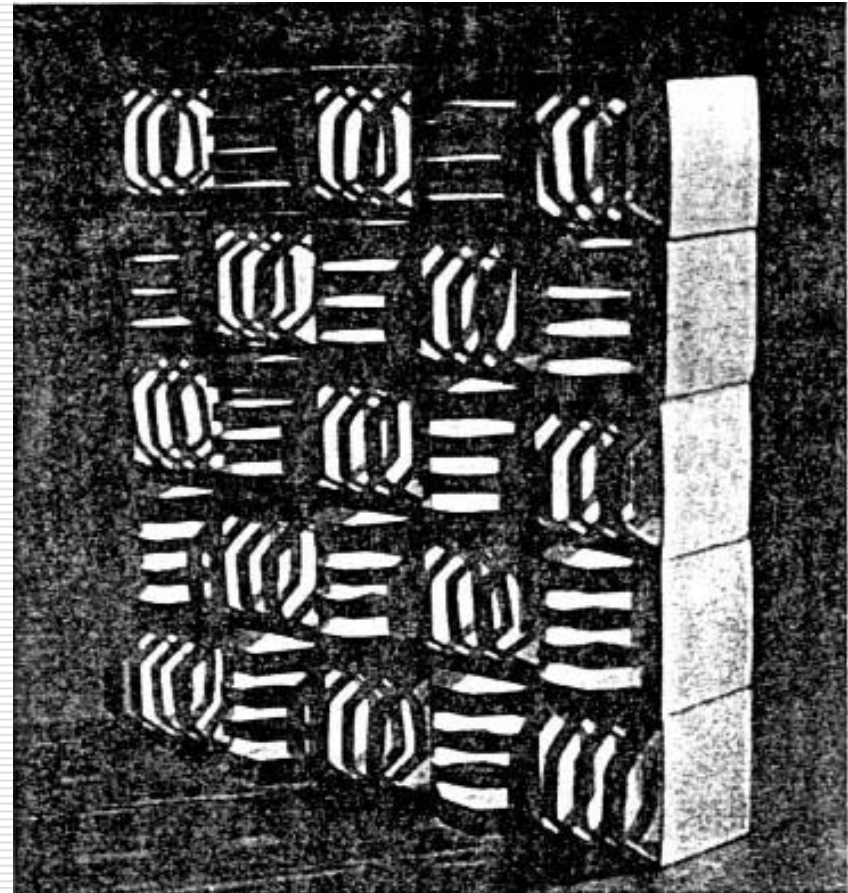
Wall Structures: Examples

- ❑ Spatial Cells have been so greatly transformed that they become Unit Forms that are very linear in character
- ❑ The depth of the design is shallow but it contains a large number of tilted planes in various directions



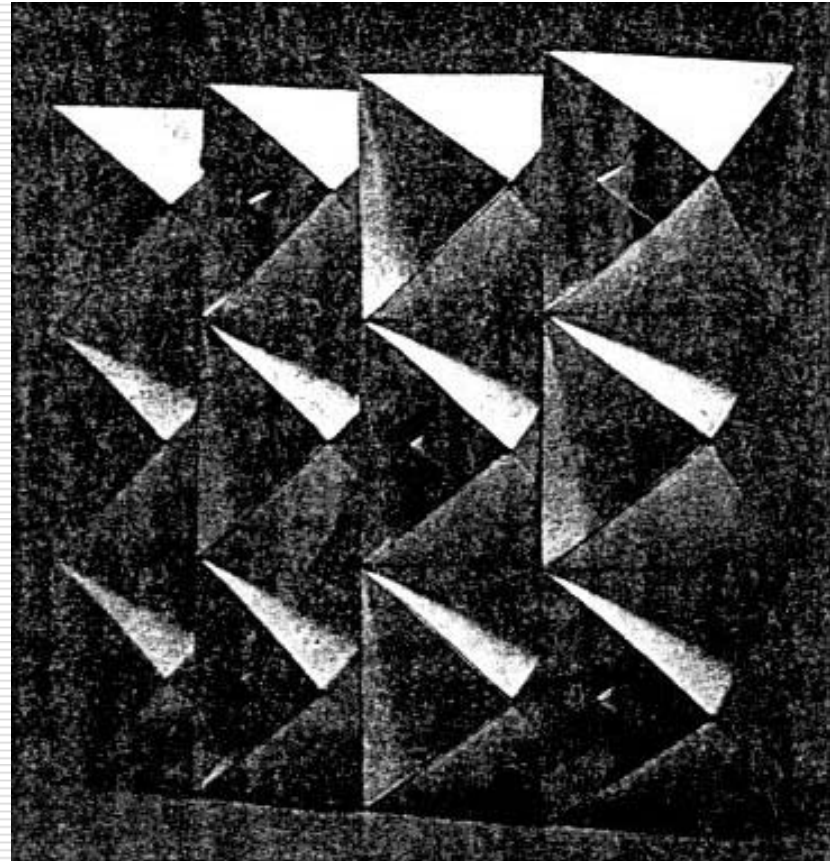
Wall Structures: Examples

- Unit Forms are placed in each Spatial Cells while projecting from the wall structure



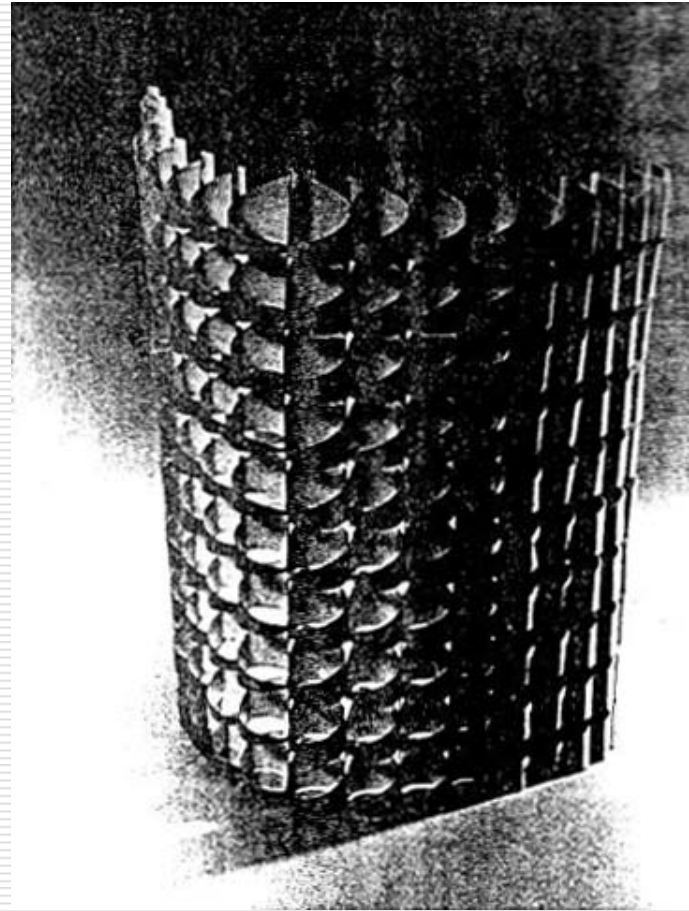
Wall Structures: Examples

- ❑ Spatial Cells & Unit Forms are one.
- ❑ Triangular planes instead of square planes have been used in the construction



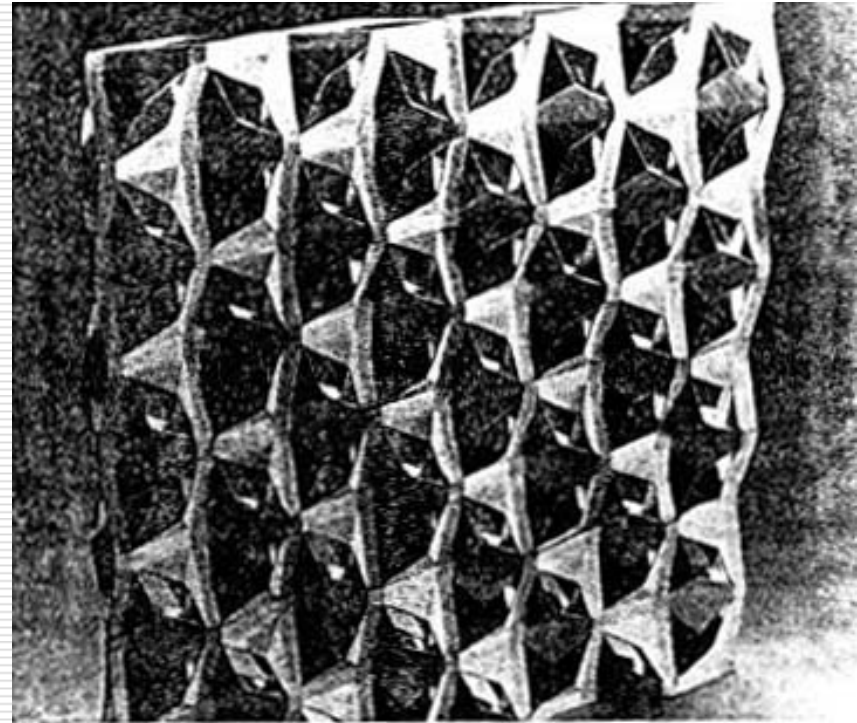
Wall Structures: Examples

- ❑ Spatial Cells & Unit Forms are one.
- ❑ Gradation of cylindrical shapes
- ❑ As contact between curved surfaces is limited, the whole Wall Structure is quite flexible and can be curled at will.



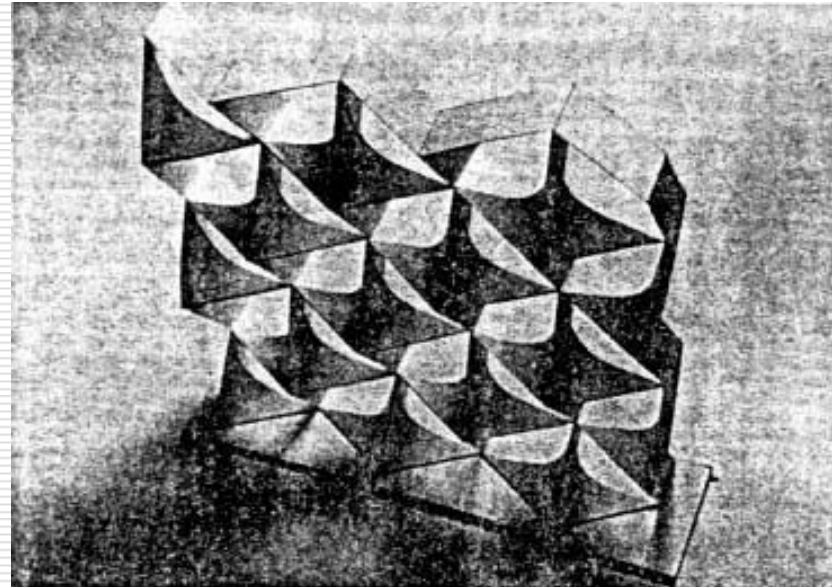
Wall Structures: Examples

- The faceted surface of this structure has a relief effect



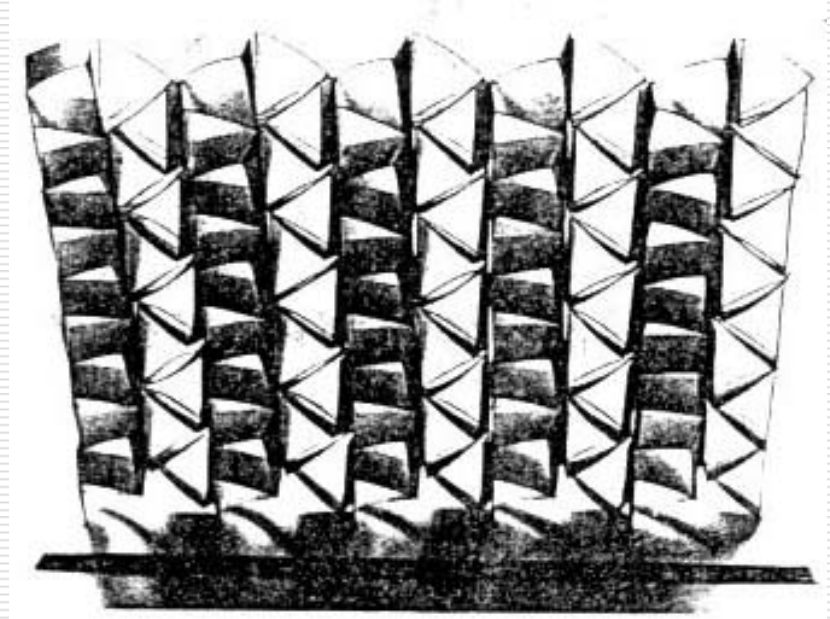
Wall Structures: Examples

- ❑ Spatial Cells are triangles
- ❑ The Unit Form inside is a piece of curled plane joining two edges of the Spatial Cell



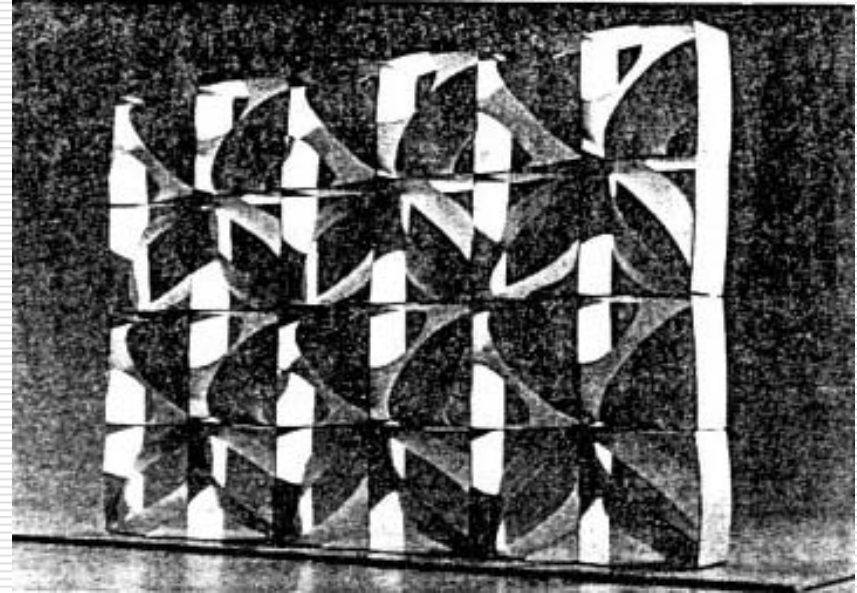
Wall Structures: Examples

- A strip of thin cardboard is folded three times to form a Spatial Cell which is also the Unit Form

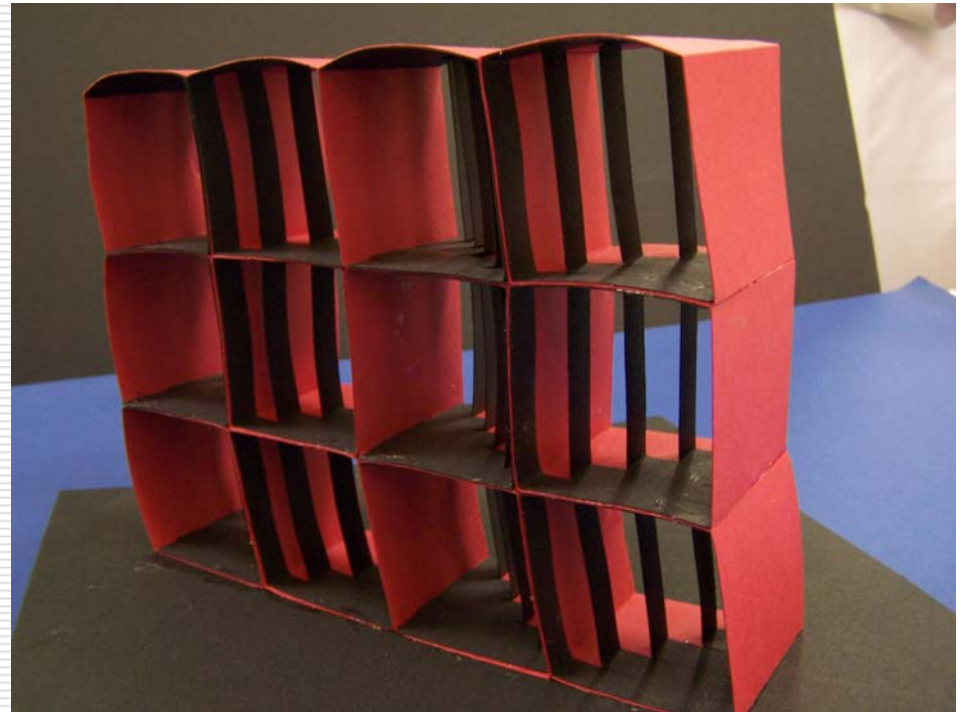
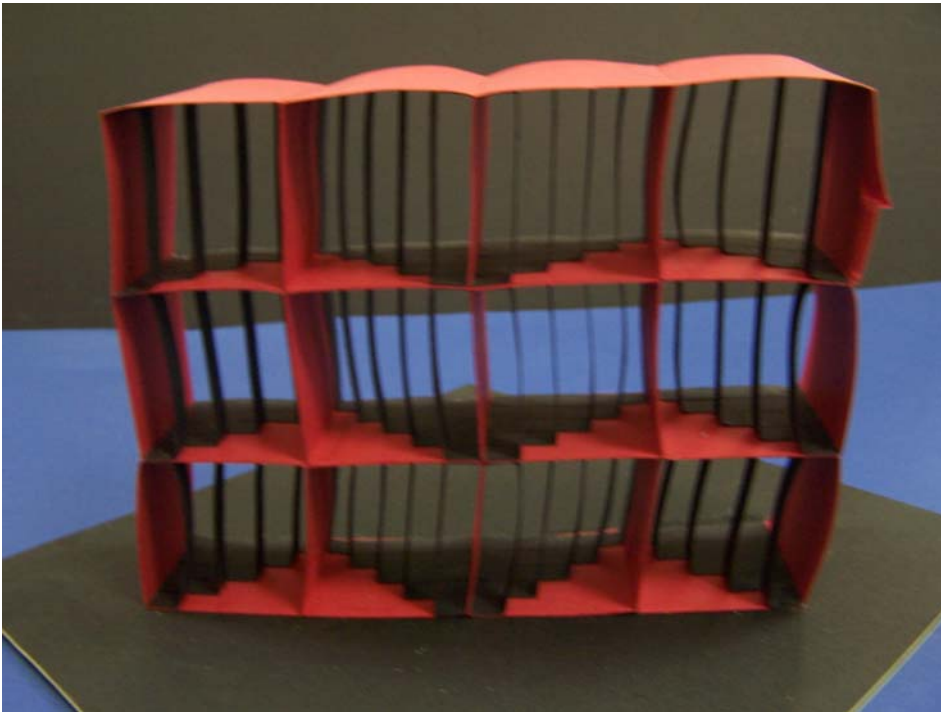


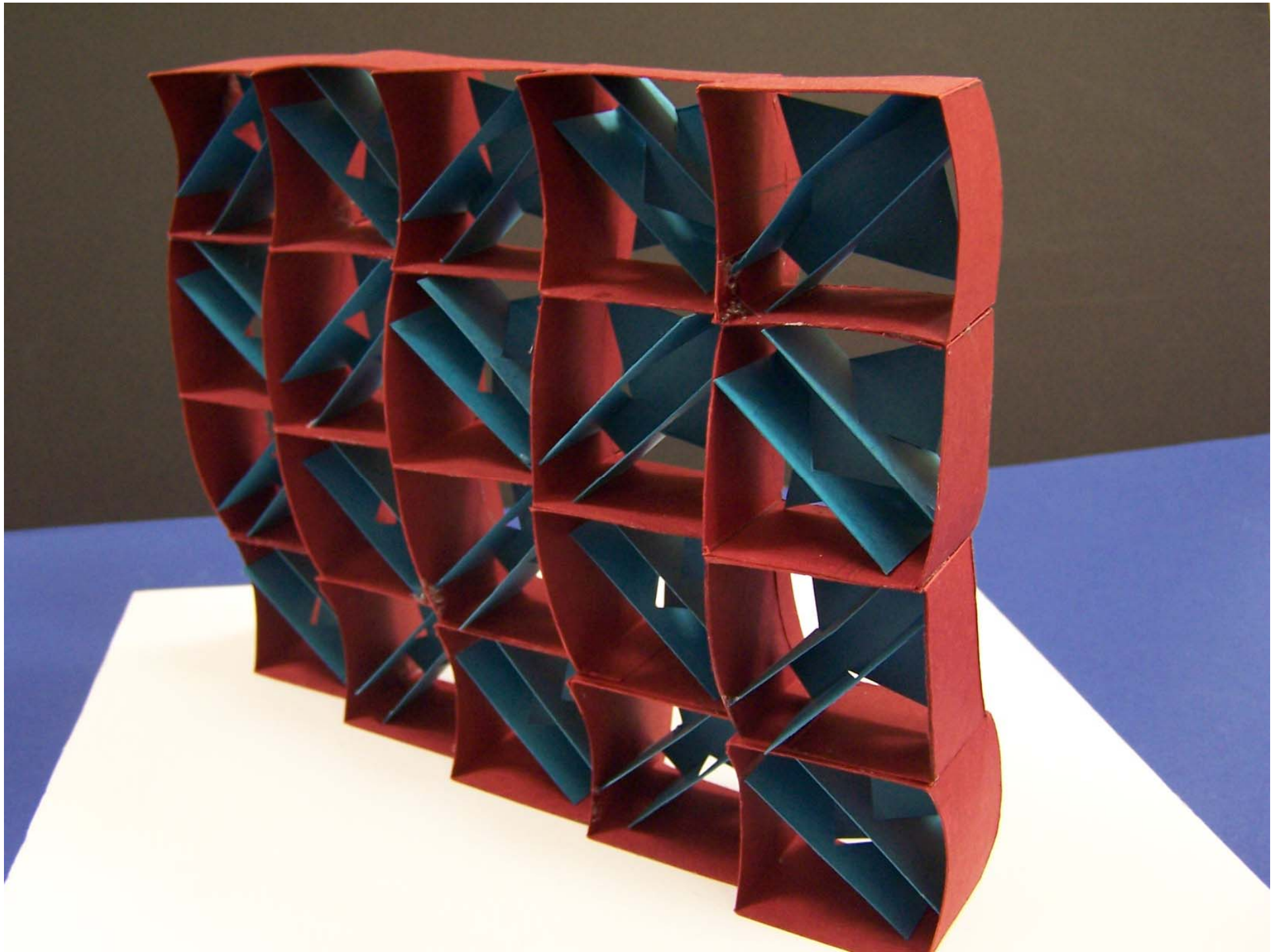
Wall Structures: Examples

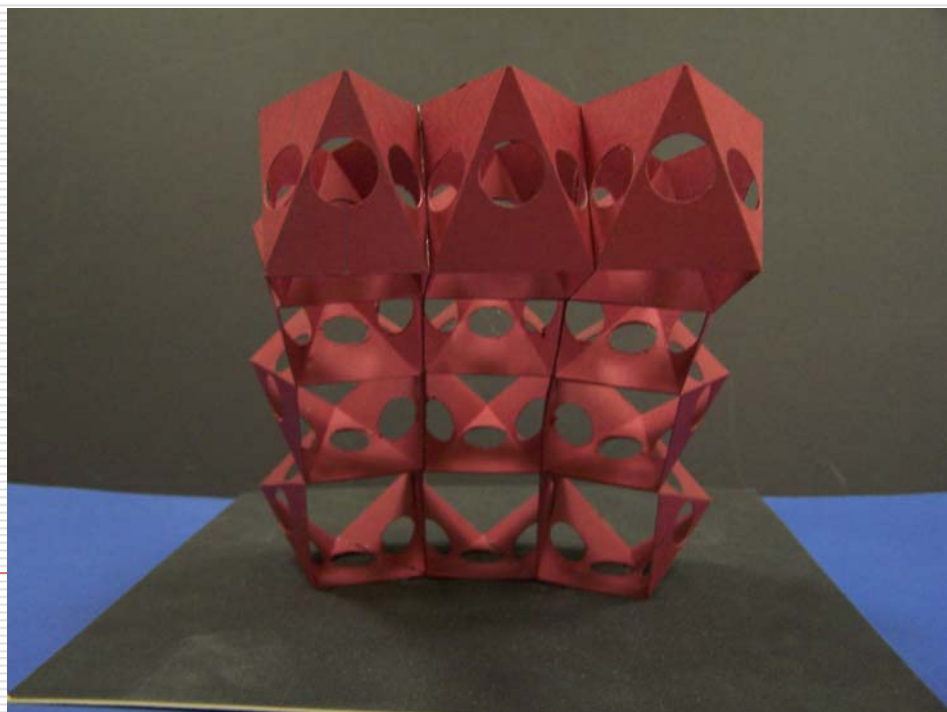
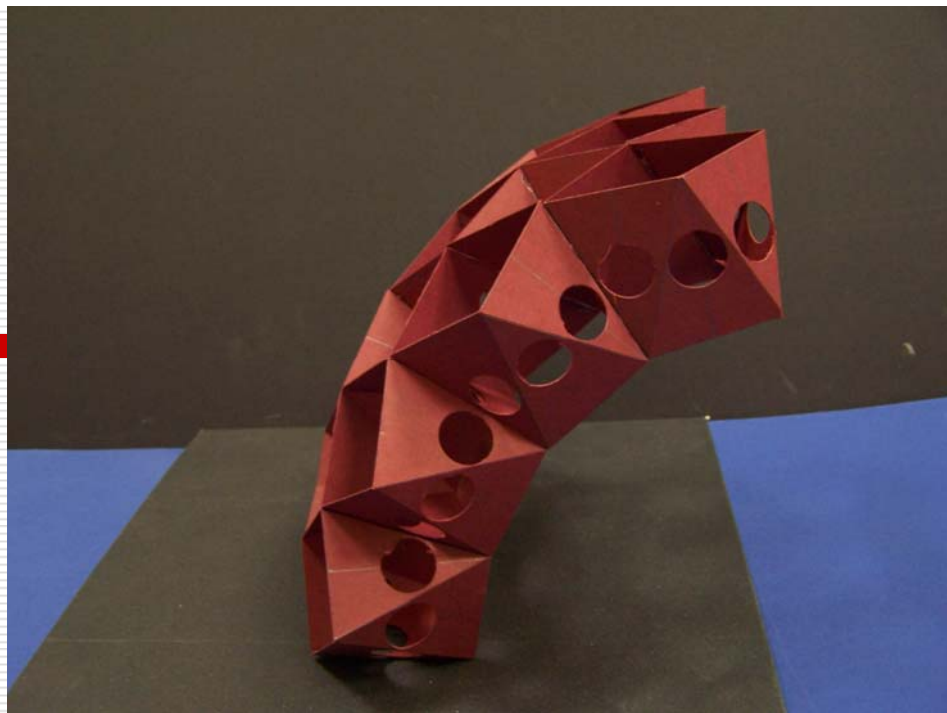
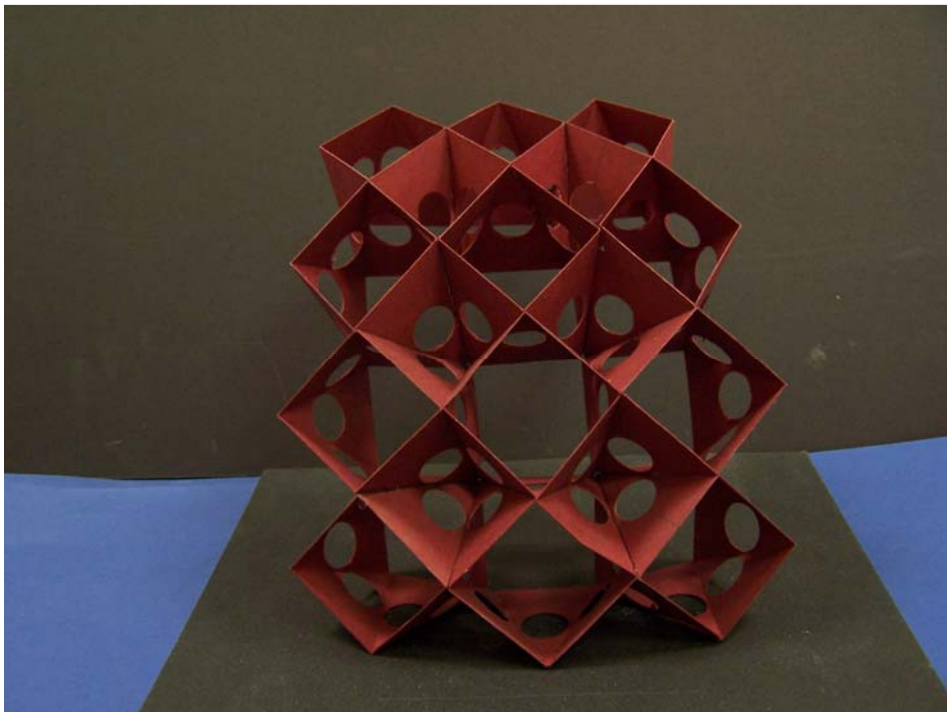
- ❑ The Spatial Cells are cubical
- ❑ The Unit Forms are made of curled strips of thin cardboard



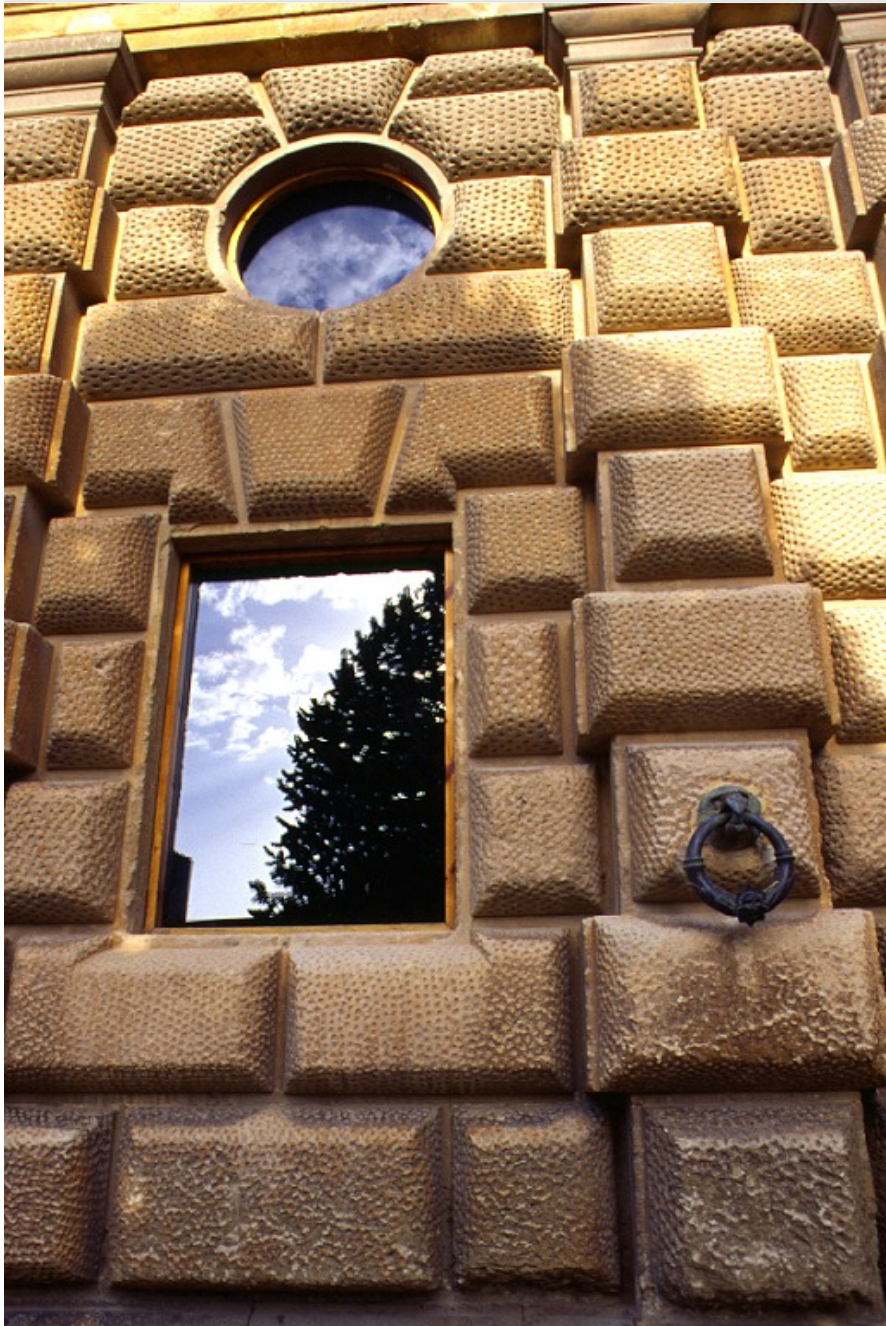
Wall Structures: Examples



























تم بحمد الله