

Kurdistan Region - Iraq
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Building Elements

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CORSE BOOK – YEAR: 2ND STAGE

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Introduction of Building Elements



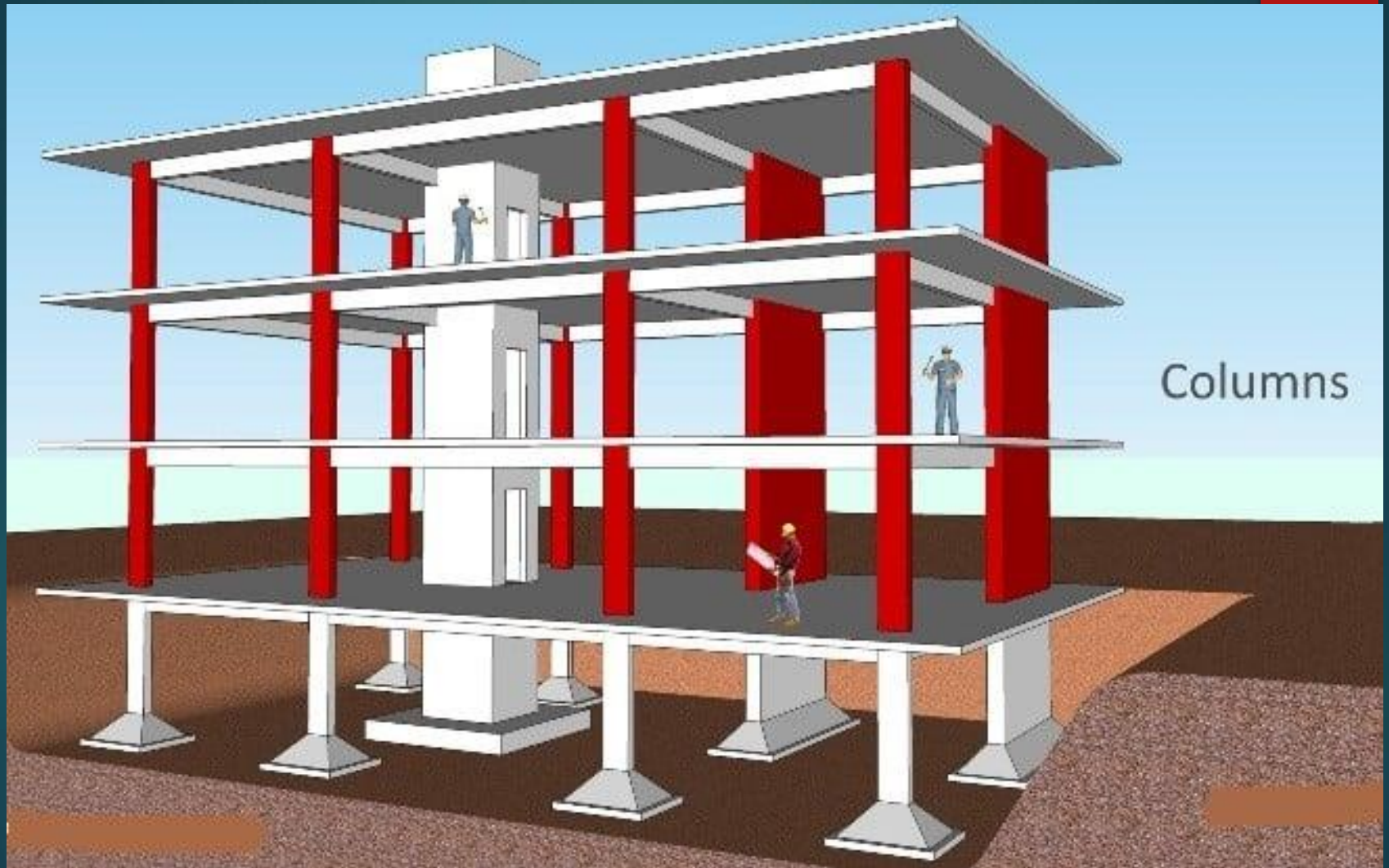
Figure.1: Basic components of building

▶ There Mentioned below are the 12 basic elements a building structure.

1. **Foundation**
2. **Plinth**
3. **Plinth Beam**
4. **Stairs**
5. **Floor**
6. **Walls**
7. Damp proof course (DPC)
8. **Columns**
9. Beams
10. Lintels
11. Parapet
12. Roof

8.Column:

Columns are defined as **vertical load-bearing members** supporting axial compressive loads chiefly. This structural member is used to **transmit the load of the structure to the foundation**. In reinforced concrete buildings beams, floors, and columns are cast monolithically. The bending action in the column may produce tensile forces over a part of cross-section. Still, columns are called compression members because compressive forces dominate their behavior.




Columns

8.Column:

column, in architecture, **a vertical element**, usually a rounded shaft with a capital and a base, which in most cases serves **as a support**. A column may also be **nonstructural**, used for a **decorative purpose** or as a freestanding monument.



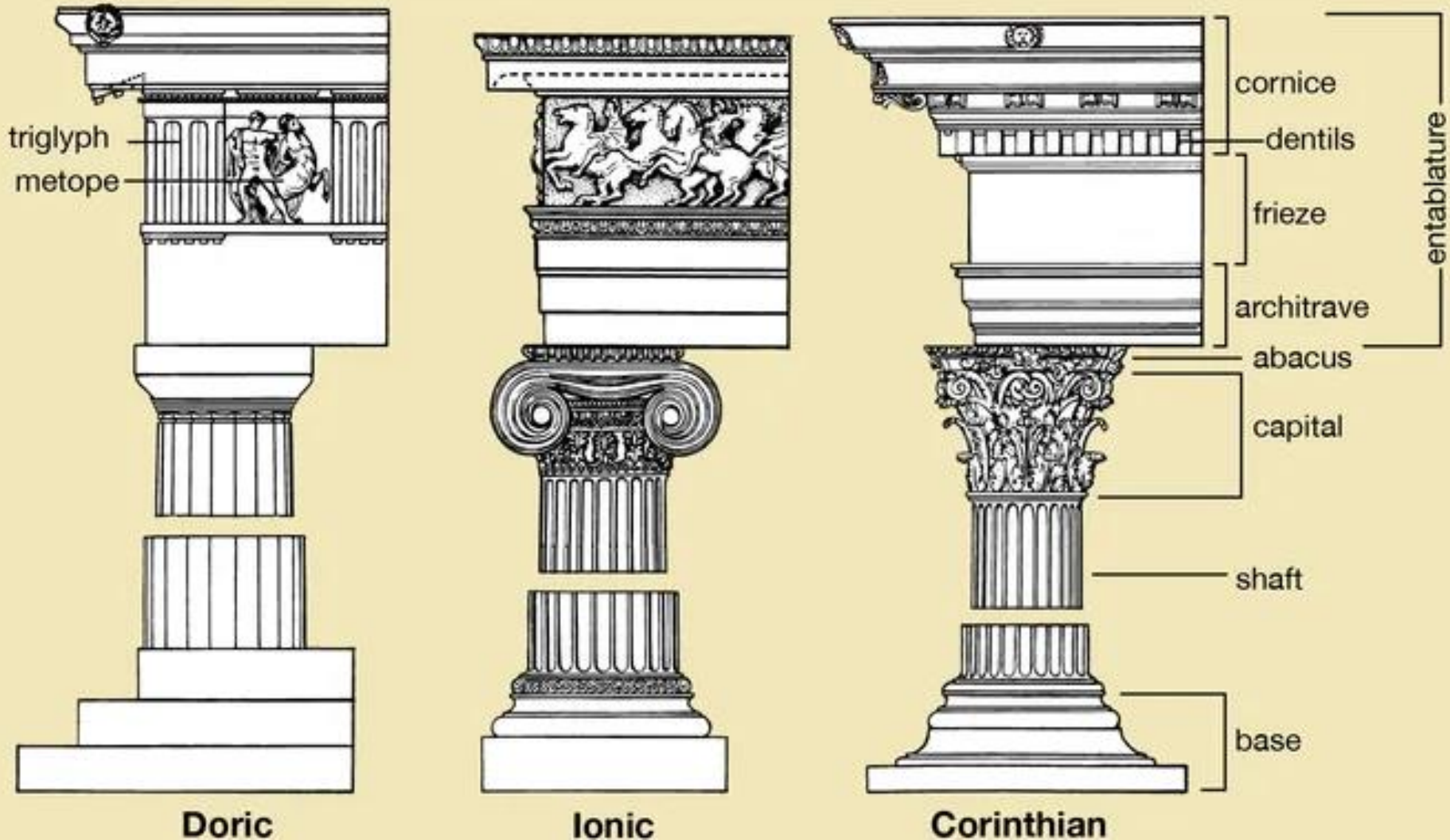
In the field of architectural design a **column is used for decoration as well as support. Classical Greek and Roman architecture** made use of five major orders (or styles) of columns, carved from single blocks or created from stacks of massive stone blocks. In **ancient Egypt and the Middle East**, columns, usually **large and circular**, were used with great effect to **decorate and support massive structures**, especially in the absence of arches.



In **Eastern architecture**, columns tend to be **simple in shape but richly decorated**. Craftsmen of the Gothic and Romanesque era, used the bases and capitals of supporting stone columns as spaces for intricate carving. **Baroque designs** often featured sinuously carved **columns of marble**. **Modern columns** tend to be made of **iron, steel, or concrete** and are simply designed.

Column: orders

Comparison of three of the main Greek column styles—Doric, Ionic, and Corinthian.



A compression member, i.e., column, is an important element of every **reinforced concrete** structure. These are used to **transfer a load of superstructure to the foundation** safely.

Mainly columns, struts, and pedestals are used as compression members in buildings, bridges, supporting systems of tanks, factories, and many more such structures.

A **column** is defined as a vertical compression member who is mainly subjected to the effective length and axial loads of which exceeds three times its least lateral dimension.

Types of Columns:

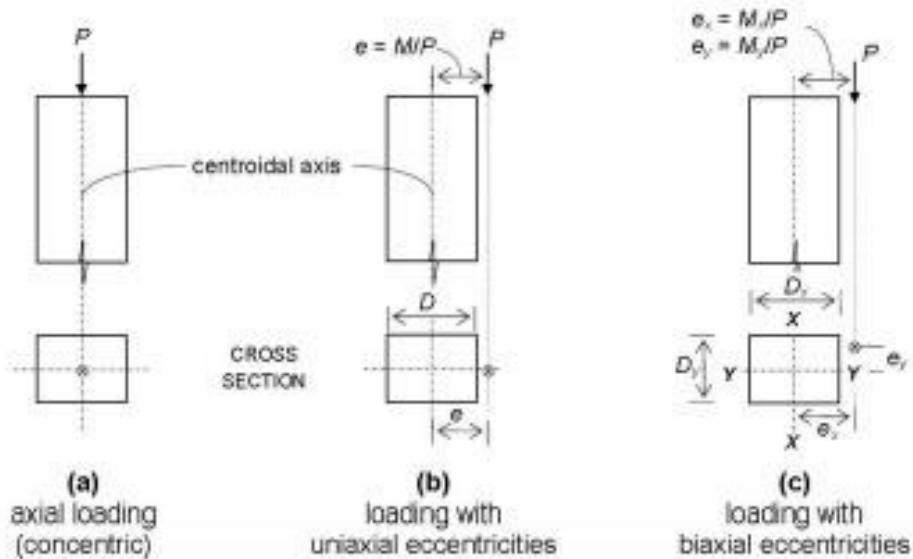
Columns can be of many types based on loading, length, column ties, frame bracing, etc. The types of columns used in construction are as stated below:

A. Based on Loading:

- I. Axially Loaded Columns
- II. Eccentrically Loaded Columns: Uniaxial
- III. Eccentrically Loaded Columns: Biaxial

B. Based on Column Ties:

- I. Tied Columns
- II. Spiral Column

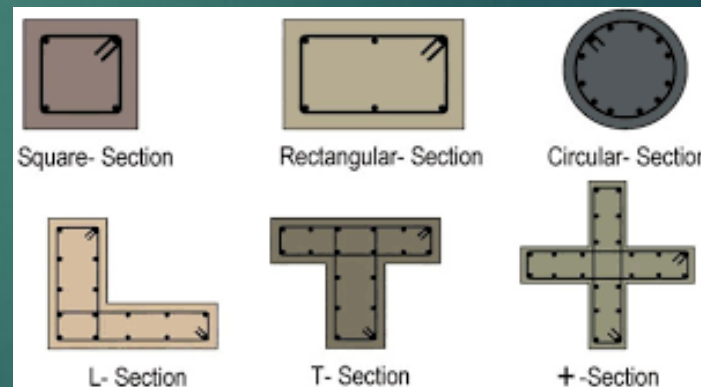


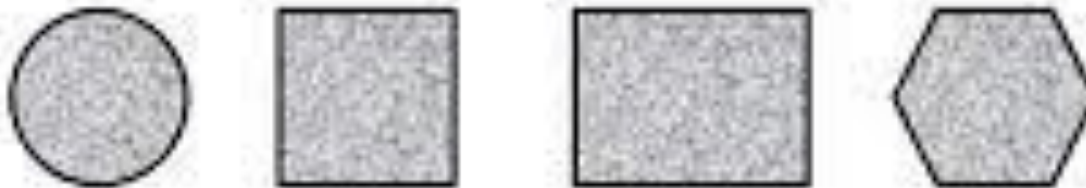
Different loading situations in columns



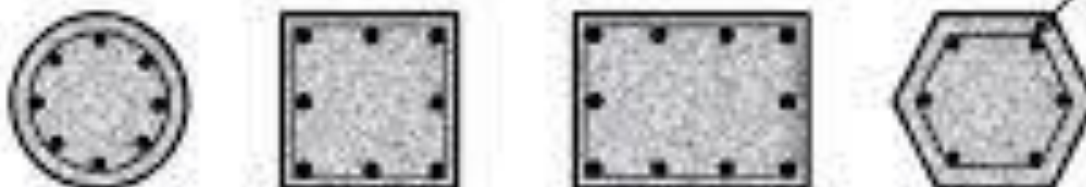
C. Based on Shape of Cross Section:

- I. Geo-matric shaped
- II. Rectangular, Round, Octagonal, Square, etc.
- III. L-shaped
- IV. T-shaped
- v. V-shaped





(a) Concrete filled tubes without reinforcement



(b) Concrete filled tube with reinforcement



Composite Columns

Column:

SECCIONES DE PILARES DE HORMIGÓN ARMADO



35x25 cm
4Ø12 / eØ6x15 cm



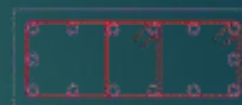
40x30 cm
4Ø12 / eØ6x15 cm



45x35 cm
4Ø12 / eØ6x15 cm



50x35 cm
10Ø12 / eØ6x15 cm



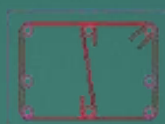
60x40 cm
14Ø12 / eØ6x15 cm



25 cm
6Ø12 / eØ6x15 cm



30x30 cm
4Ø12 / eØ6x15 cm



35x35 cm
4Ø12 / eØ6x15 cm



40x30 cm
10Ø12 / eØ6x15 cm



70x30 cm
10Ø12 / eØ6x15 cm

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30 cm
6Ø12 / eØ6x15 cm



40x40 cm
4Ø12 / eØ6x15 cm



45x45 cm
10Ø12 / eØ6x15 cm



55x55 cm
10Ø12 / eØ6x15 cm



35x25 cm

25x25 cm
13Ø12
2eØ6x15 cm



45x35 cm
14Ø12
2eØ6x15 cm



50x30 cm
10Ø12 / eØ6x15 cm



60x30 cm
14Ø12 / eØ6x15 cm

D. Based on Construction Materials:

- I. Reinforced Concrete Column
- II. Composite Column
- III. Steel, Timber, Brick Column



Shape of Column:

The compression member who is inclined or horizontal and is subjected to axial loads is called Strut. Struts are used in trusses.

The function of columns is to transfer the load of the structure vertically downwards to transfer it to a foundation.

Apart from the wall performs the following **functions** also:

- **It encloses building areas into different compartments and provides privacy.**
- **It provides safety from burglary and insects.**
- **It keeps the building warm in cools in summer and winter.**

Difference Between Beam and Column:

The minimum width of the beam is 200 mm. The minimum width of a column is 200 mm, however, for earthquake resistance, it should be 300mm.

Difference Between Beam and Column:

Sr.No.	Beam	Column
1	Communally a horizontal member of a structure that resists transverse load is called a beam.	Communally a vertical member of a structure that resists axial/eccentric load is called a column.
2	The beam is carried load perpendicular to the longitudinal axis.	The column is carried load parallel to the longitudinal axis.
3	Beam is basically carried or resists bending and shear force.	Column is basically carried or resists compression load.
4	Beams shapes can be square, rectangular, T shape, I shape, H shape.	Column shape can be rectangular, circular, square, T shape, L shape, C shape, elliptical etc
5	Minimum width of the beam is 200 mm.	Minimum width of a column is 200 mm , however, for earthquake resistance, it should be 300mm.
6	Longitudinal steel in Beam is on two faces which are used to resist bending moment while the vertical loads are resisted by stirrups or inclined beam	Longitudinal steel in Column is on all faces which basically resists compression
7	Communally cast with slab and hence greater care is observed for its concreting and curing in case of RCC structures.	Communally cast in small batches and hence the quality of concreting as well as curing ignored in case of RCC structures.
8	Beam without building possible	Here, Column important part of building

Thank You