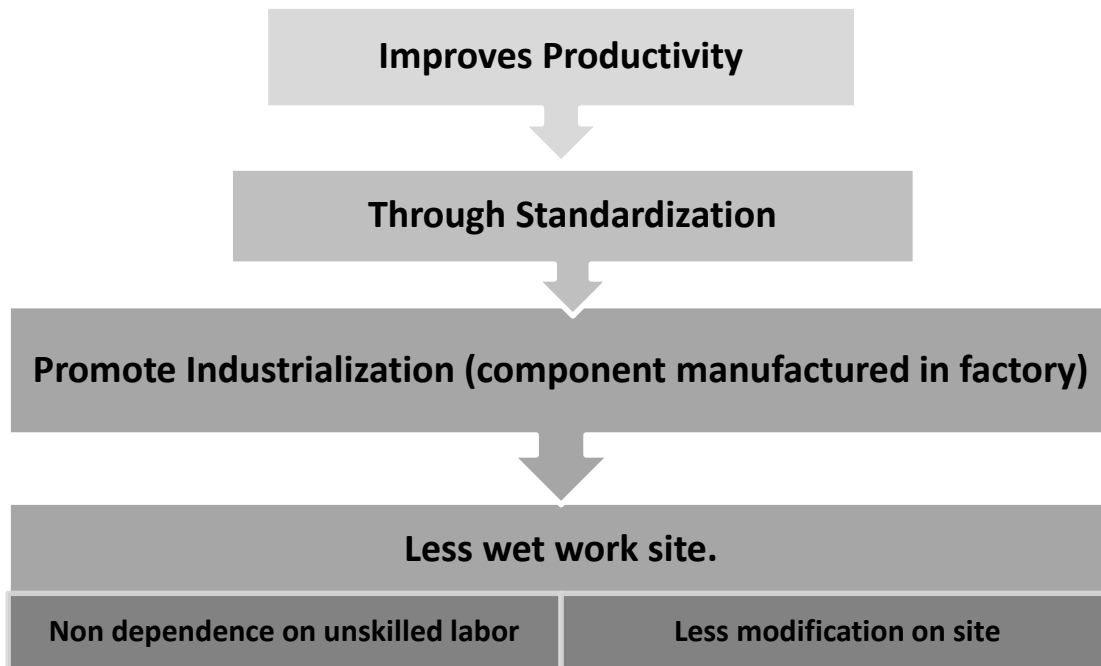


M|O|D|U|L|A|R
C|O|O|R|D|I|N|A|T|I|O|N

MODULAR COORDINATION

- Modular coordination is a concept of coordination of dimension and space in which buildings and components are dimensioned and positioned in terms of basic unit or module.
- It is internationally accepted by the International Standard Organization and many other countries including Malaysia.



- A module: a basic dimension which could for example form the basis of a planning grid in terms of multiples and submultiples of standard module.
- Provide guide to building component sizing: this can reduce as much as possible the needs to further trim and shape the materials to fit together in construction; thus, reducing wastage of labor and material.

Aim and Basics of Modular Coordination

AIMS

- To achieve dimensional compatibility between building dimensions, span, or spaces and the sizes of components or equipment by using related modular dimensions.
- Making the planning simpler & clearer by distinct indication of location of the building component in the building, both in respect to each other & a modular grid.
- Simplification of site work.
- Limiting the member of sizes of building component so that the linkage is based on modular measurement.
- Facilitating cooperation between designers, manufacturers, suppliers & builders.
- Providing practical and logical construction methods for the coordination of the position & dimension of elements, components & spaces in a building design, which will contribute to
 - first - increased design freedom.
 - second - improve balance between quality and cost of the manufacturing the component.
- Creating a basis for rationalization of both general & special building drawings for modular building components & assembling details.

BASICS OF MODULE

- **The basic module is known as 1M which is equivalent to 100mm.**

$$1M = 100mm$$

There are three type of MODULE :-

(I) Basic Module

(II) Multi Module

(III) Sub Module

Basic Module

- It is the fundamental unit of size in modular coordination and for general application to building & components .The size of basic Module is taken as 100mm denoted by “M”
It is considered to be large enough to effect some variety reduction in range of component size and is small enough to provide a flexible unit of measurement for the purpose of design.

Multi Module

- Certain whole multiples of basic module usually expressed in as “M” with numeric prefix as 2M , 3M, 4M etc are referred to as multi module.

Sub Module

Certain submultiples of basic module which are whole simple fractions shall be chosen when absolutely necessary for an increment smaller than the basic module. For practical considerations, this sub modular increment shall be expressed as “M” with fractional prefix as 1/5M, 1/4M, 1/3M,etc

Modular Reference System

- The term **modular reference systems** is the three dimensional system of orthogonal space coordinates within the positions and sizes of components, elements and installations can be related by references to points, lines, or planes.
- A system of points, lines and planes grids.
- Used mainly during planning / design stage.

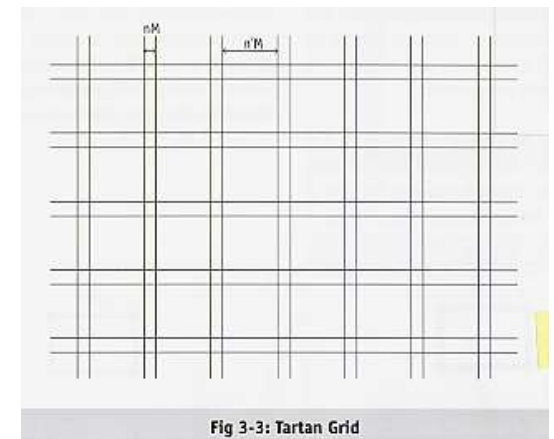
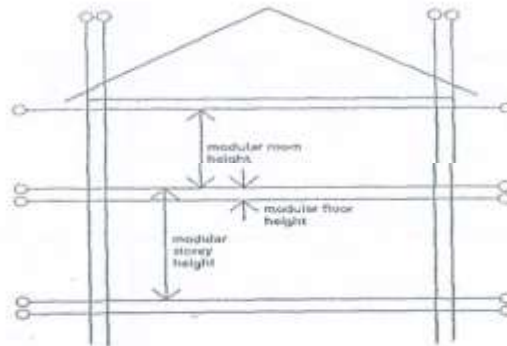
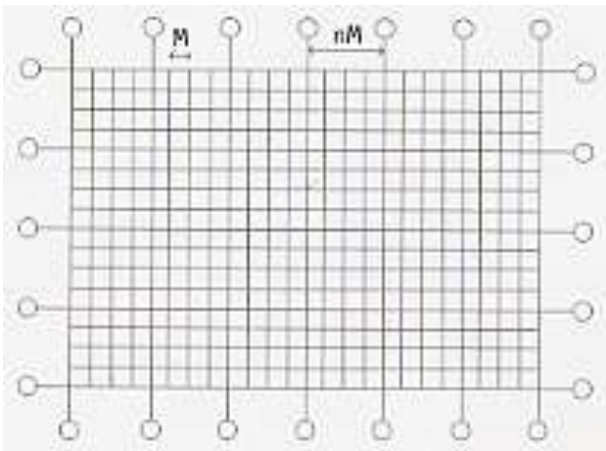
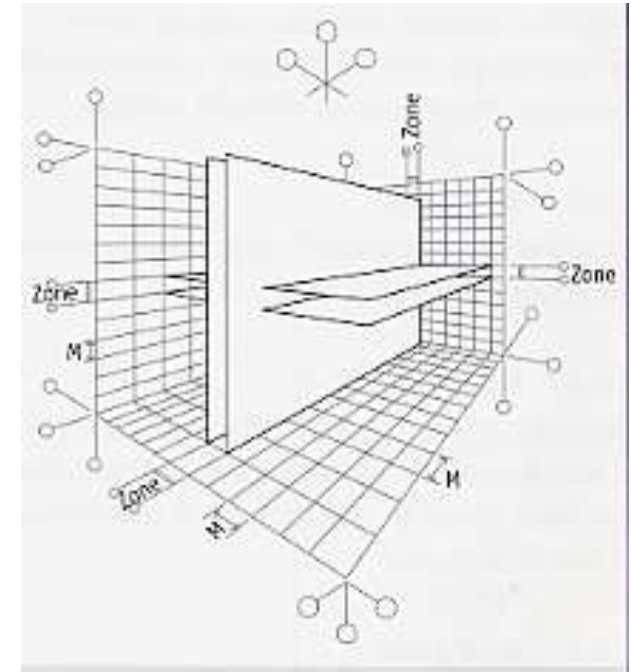
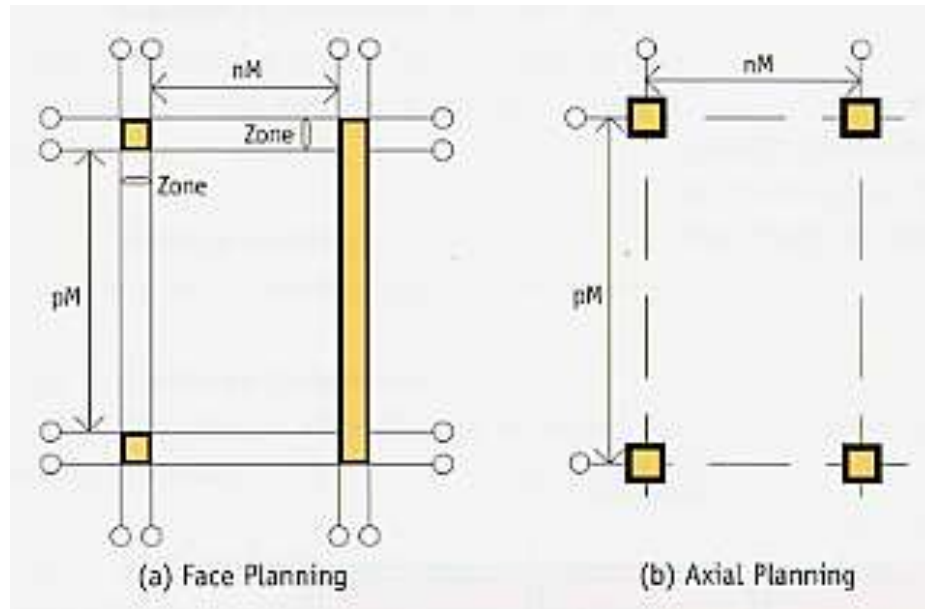


Fig 3-3: Tartan Grid

CONTROLLING REFERENCE SYSTEM

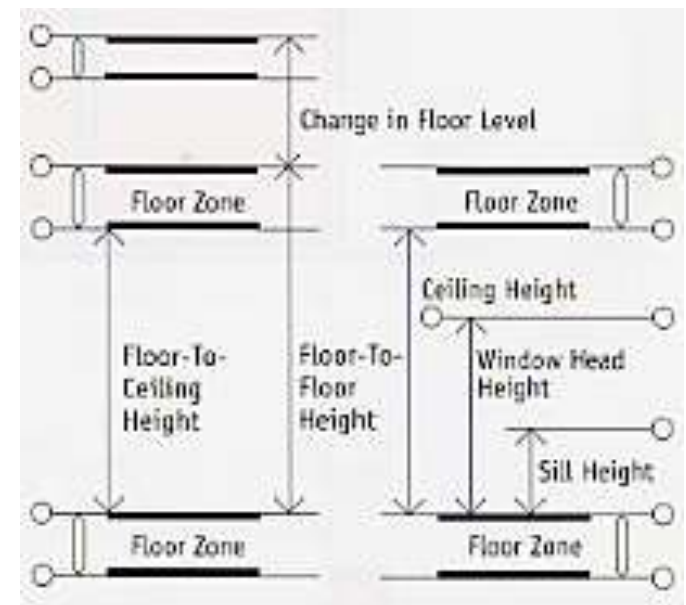
- Reference planes can be identified which locate the main vertical and horizontal elements of construction, e.g. floor, walls, and columns.

- Horizontal Controlling dimensions**



Traditionally, modular theory has distinguished between boundary planning and axial planning. In practice, however, such a clear-cut distinction may not exist

- Vertical Controlling dimensions**



In the vertical section that modular floor plane is the reference plane from which modular dimensions are taken.

Positioning of components and space

(a) Boundary reference

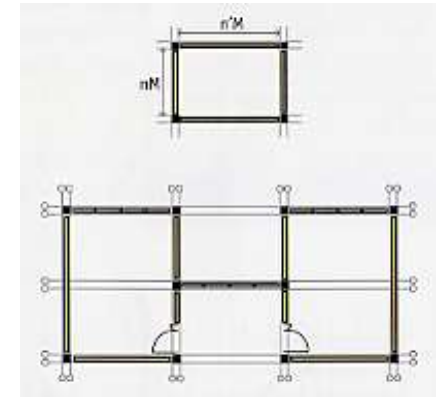
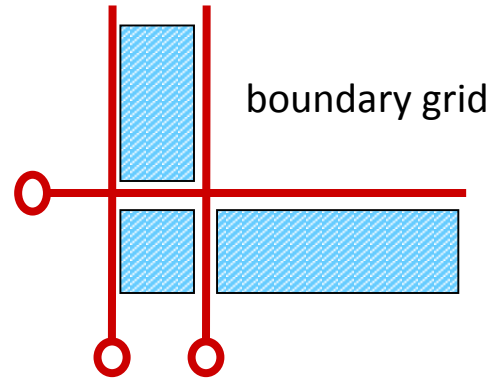
(c) Interaxial reference

(b) Axial reference

(d) Flush reference

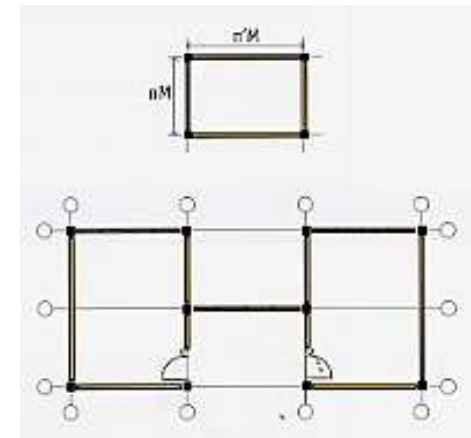
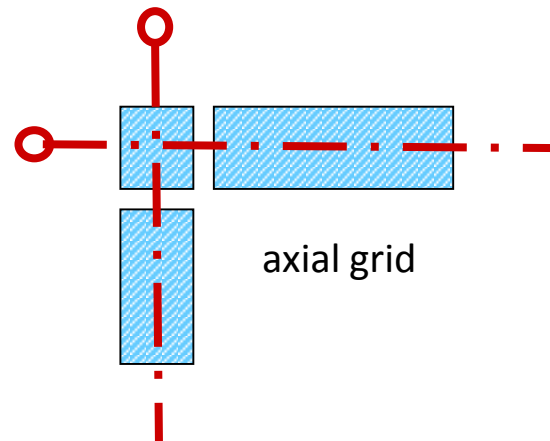
• Boundary reference

- coordinates the position of the building components.
- determines the nominal size of components.
- placement of component within two Parallel modular Coordinating grids or planes so that it fills the space.



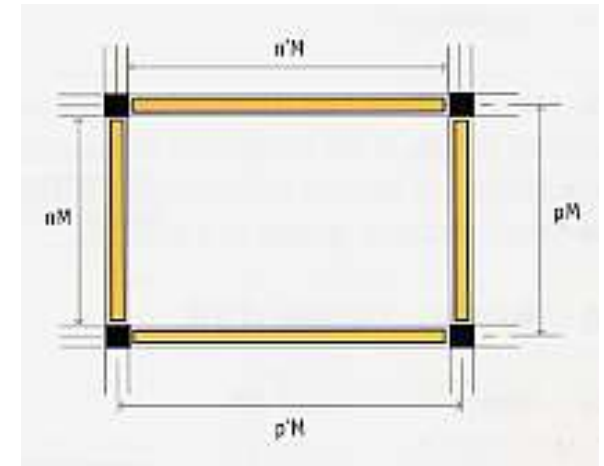
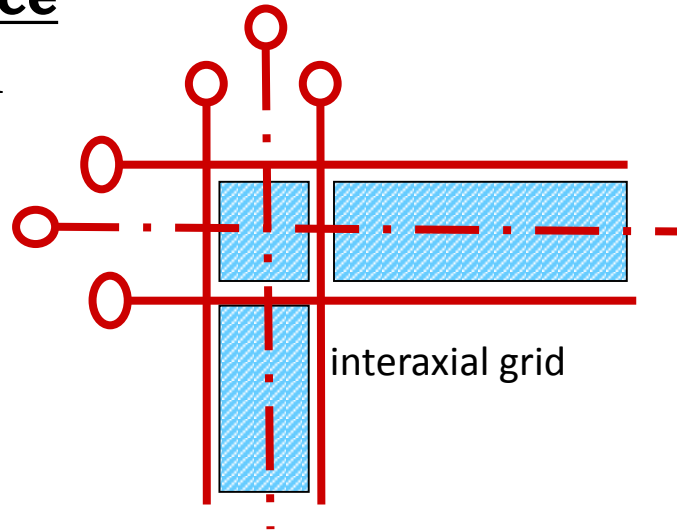
• Axial reference

- coordinates the position of a components by placing the component so that the middle-axis coincides with a modular coordinating grid.



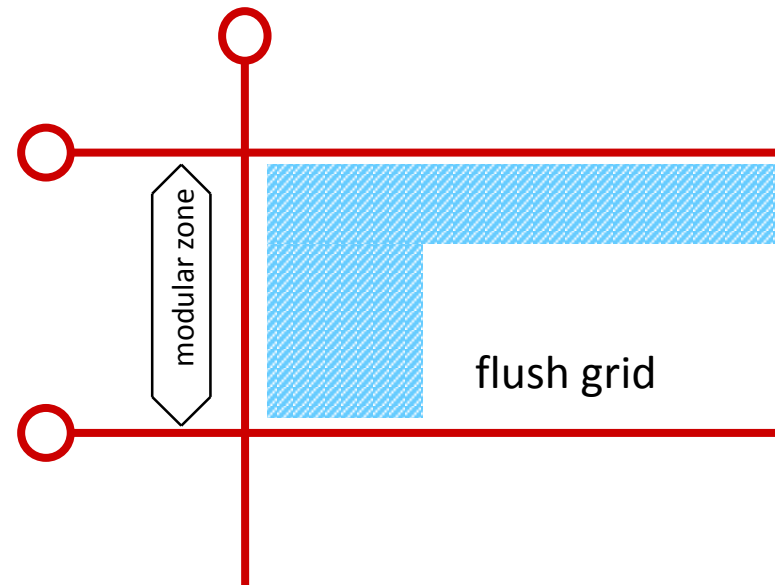
• Interaxial reference

- coordinates the position and dimension of building component by a reference.



• Flush reference

- coordinates the position of components by placing one surface of the component flush on to a modular coordinating grid or plane.

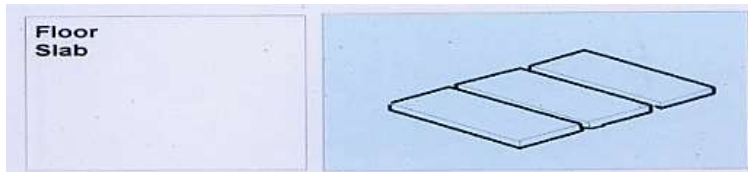
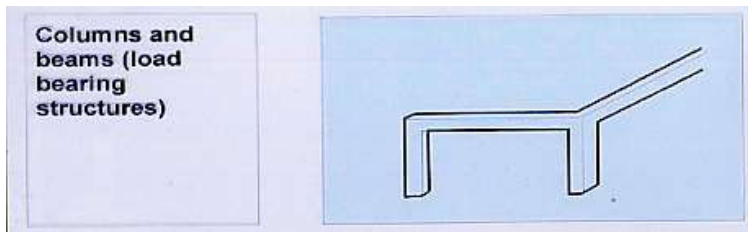
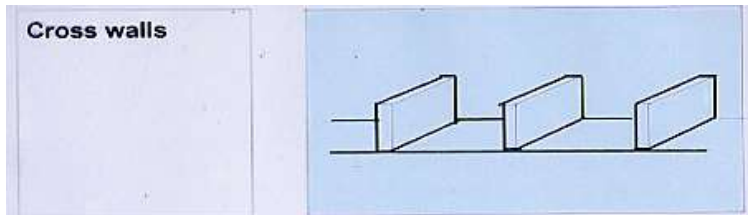
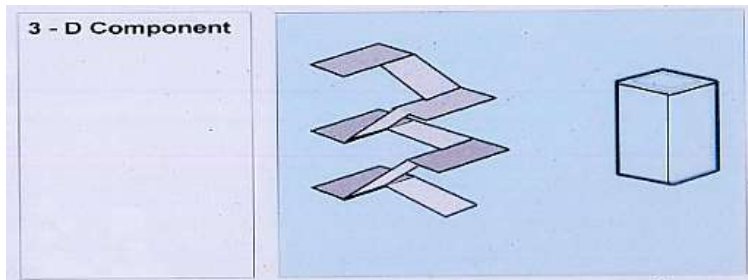


Positioning of Building Components

- **Designing with components**

must be conceptualized early in design stage.

bearing on choice of planning grids and approaches.



- **Structural components**

Columns

Beams

Floor slabs

Walls

Staircases and lift cores

- **Non structural components**

Cladding

Partition

Doors

Windows

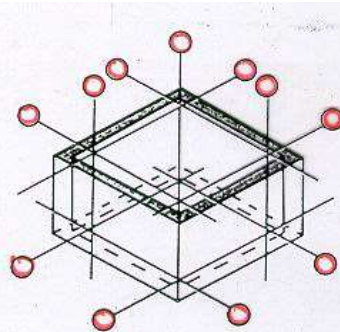
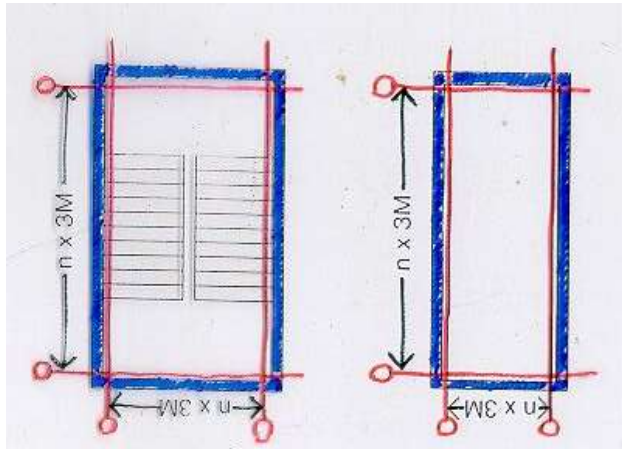
- **Finishes**

Ceiling finishes

Floor finishes

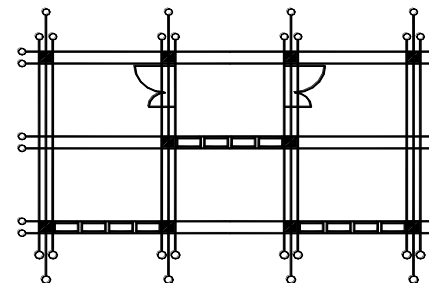
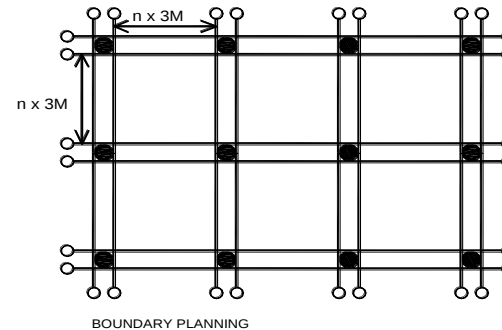
Wall finishes

- **Non-monolithic 3-D components**
- components are dimensioned within the horizontal and vertical planning modular increments.
- The load bearing and self bearing parts if any, are on the outside of the modular planes.

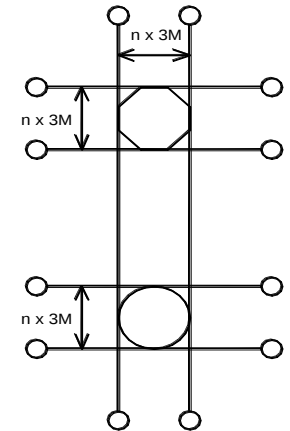


MODULAR RULE 3.2.6 (b)

- **Columns**
- basic dimensions –
3M / multiples of 3M.
- dimensions fit into modular grid planning structural grid.
- dimensions are for finished dimensions.

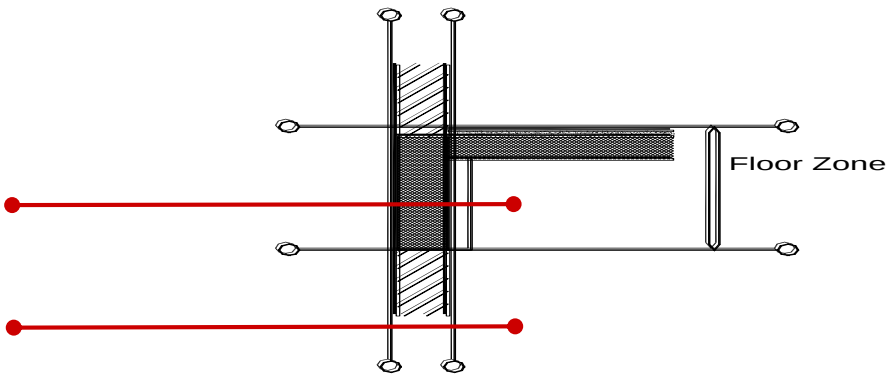


DISPLACEMENT OF GRID PLANNING

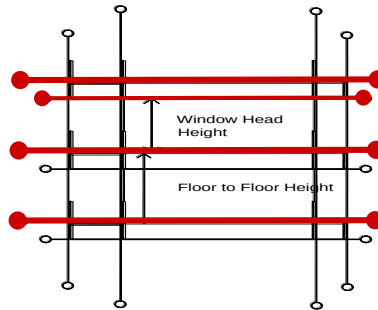


- **Beams**

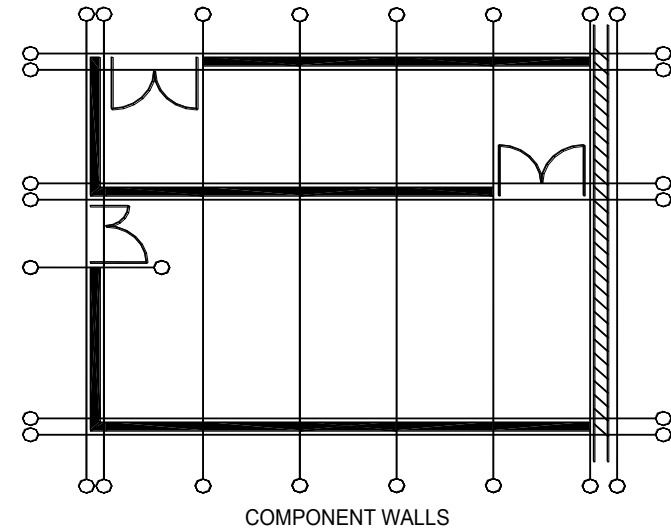
- Beam depth are in the increments of M
- floor zone with false ceiling
 - beams accommodated in floor zone
 - beams depth only affect services, not walls / partition below



- floor zone without false ceiling
 - distance between base of beam and floor slab must be modular to accommodate the components below.



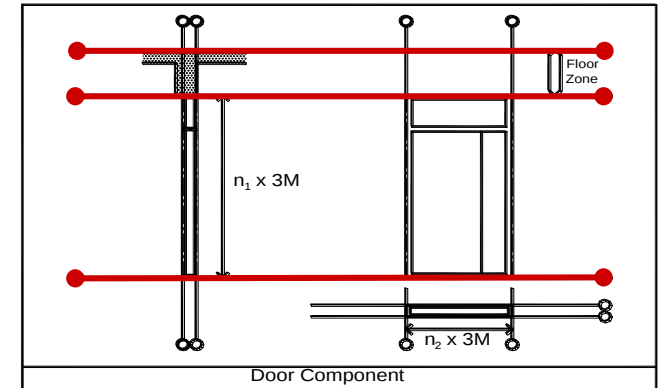
- **Walls**



- precast load bearing walls
- length of walls determined by planning grid
- dimensions - finished wall dimensions
- in cases wall do not fill the whole wall zone, where structure allows, wall should be lined with one side of the zone to minimize number of adaptation pieces.

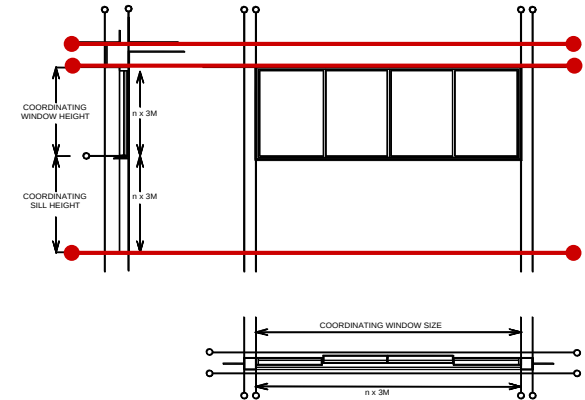
- **Door**

- dimensions - for door sets
- controlling spaces be preferred dimensions – to allow the doors be fitted without undue adjustments (adaptation pieces fitted in walls or partitions)



- **Windows**

- dimensions - for window sets
- sill reference plane may coincide with floor reference plane.
- window head reference plane may coincide with ceiling reference plane.



- **Lift Cores**

- external dimensions be modular to relate to other elements
- more than one lift - whole assembly is treated as a single element.

