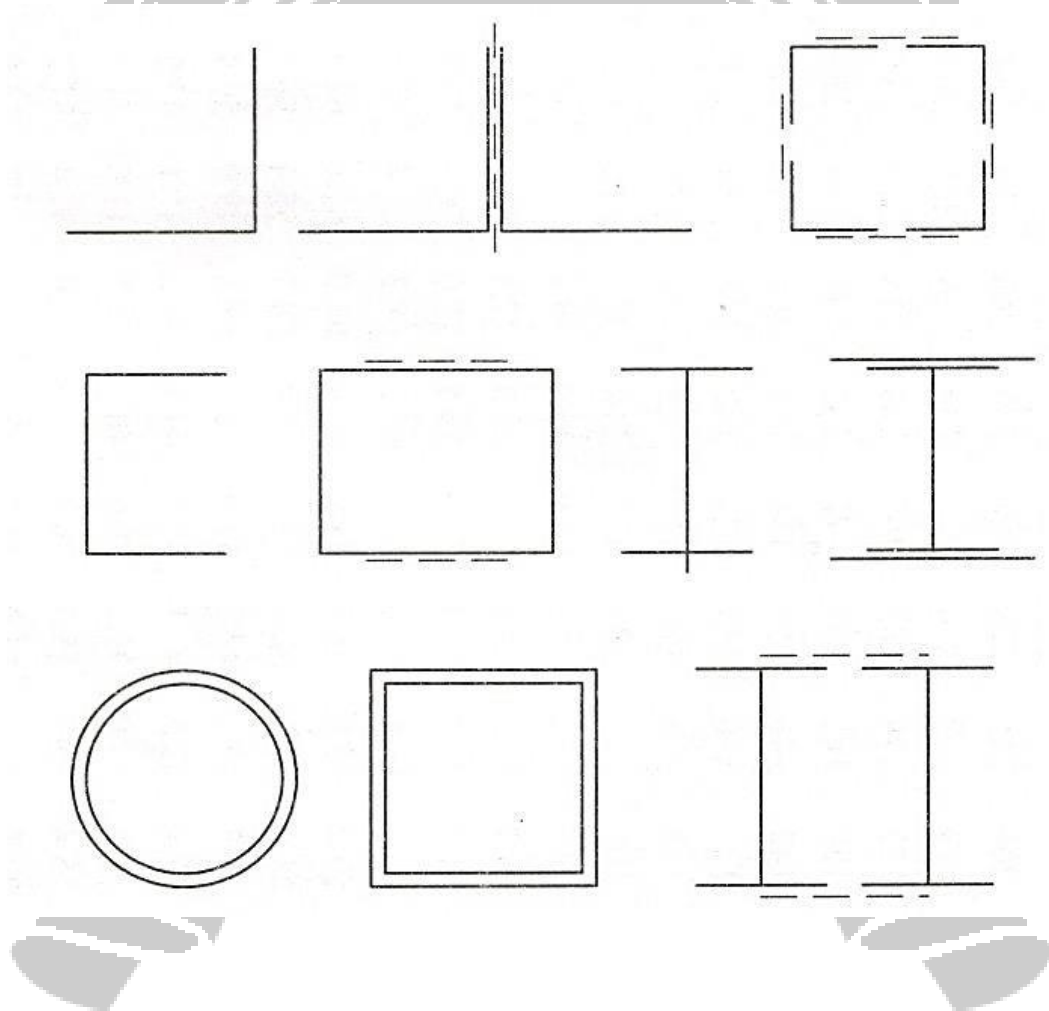


Types of compression members and sections

A compression Member is a structural member which is subjected to two equal opposite compressive forces applied at its end. Structural elements that are subjected to axial compressive forces are only called columns. A compression member may be a short column or long column based on the slenderness ratio criteria.

Compression members are used as columns (when it is vertical in position) in building structures; chords or webs are in trusses, bridge piers, or braces in framed structures. Compression members in buildings may be columns, posts, or stanchions. In roof trusses, compression members are called struts (lightly loaded compression members usually have a small span); in a crane, a compression member is called a boom.



X = Stress reduction factor [see table-8]

$$= \frac{1}{\left[\phi + (\phi^2 - \lambda^2)^{0.5} \right]}$$

λ_{mo} = Partial safety factor for material strength.

KL = Depends on support condition given in table – 11


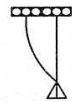
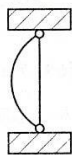



The only variable in finding the permissible comp. stress (fcd) is slenderness ratio (L/r) for the given section coming under any of the buckling class a,b,c&d.

∴ Based on the slenderness ratio, design compressive stress can be taken from table 9, 9a, 9b, 9c (or) 9d IS 800-2007.

❖ The buckling class for various section are given in Table-10 IS 800-2007 and slenderness ratio is based on eff. length given in table-11; IS 800-2007.

Table 6.2 Effective length of prismatic compression members

[Refer Table 11 in IS 800]

Boundary Conditions				Schematic Representation	Effective Length
At One End		At the Other End			
Translation (1)	Rotation (2)	Translation (3)	Rotation (4)		
				(5)	(6)
Restrained	Restrained	Free	Free		2.0L
Free	Restrained	Free	Restrained		
Restrained	Free	Restrained	Free		1.0L
Restrained	Restrained	Free	Restrained		1.2L
Restrained	Restrained	Restrained	Free		0.8L
Restrained	Restrained	Restrained	Restrained		0.65L