***IS 456 COLUMN CODE PROVISIONS***

Column definition Column Effective Length > 3 x Minmum(b,d) **[IS 456 25.1.1]**

Short Column EffectiveLength(lx)/D < 12 and ly/b < 12 **[IS 456 25.1.2]**

Long Column EffectiveLength /D >= 12 or y/b >= 12  **[IS 456 25.1.2]**

Slenderness Limit

End Restrained: UnsupportedLength <= 60 x Minimum(b,d)  **[25.3.1]**

One end Unrestrained(cantilever): UnsupportedLength <= 100 b2 /D **[25.3.2]**

Minimum Eccentricity **[24.4]**

Min of below

UnsupportedLength(l)/500 + RespectiveLateralDimension(b,d)/30

20 mm

Cover Minimum Cover >= 40 **[Is 456 26.4.2.1]**

Min dimension >= 200 that is only for column

who have bars dia <=12 only and cover =25 can be use **[Is 456 26.4.2.1]**

Min Reinforcement **0.008 b d** (gross cross section) **[Is 456 26.5.3.1]**

Max Reinforcement **0.06 b d** (gross cross section) **[Is 456 26.5.3.1]**

**Minimum no of bars is [Is 456 26.5.3.1\_c]**

4 in Rectangular Column

6 in Circle Column

Min Bar diameter **dia >=12 mm [Is 456 26.5.3.1\_d]**

Max spacing of main bar **spacing <= 300 [Is 456 26.5.3.1\_h]**

**Lateral ties min spacing**  **[Is 456 26.5.3.2\_c]**

Min of below 3

Min (b,d)

16 Dia(longitutional)

300

**Dia of tie/Helical [Is 456 26.5.3.2\_d]**

Max of below :

¼ dia of large longitudinal bar

16

**Pitch of tie/Helical [Is 456 26.5.3.2\_d]**

Max pitch

Min of below

1/6 x Dia of column

75

Min pitch

Max of below

3 x Dia of helix bar

25

* Max Compressive Strain in concrete ‘Concrete in Compressive only’

**0.002 [Is 456 39.1]**

* Max Compressive Strain in concrete concrete ‘Concrete in Compressive and bending’ when there is no tension in the section

**0.0035 – 0.75 x strain in least compressive fibre [Is 456 39.1]**

**Short Axially Loaded Column**  **[Is 456 39.3]**

Le/b < 12 short column

UnsupportedLength(l)/500 + RespectiveLateralDimension(b,d)/30 <= 0.05 x Lateral Dimension <= 20

Pu = 0.4 fck Ac + 0.67 fy Asc

**Compression Members with Helical Reinforcement** **[Is 456 39.4]**

Pu = (0.4 fck Ac + 0.67 fy Asc ) x 1.05 of tie section

**Area of helical Reinforcenment** >= 0.36(Ag/Ac - 1) fkc/fy

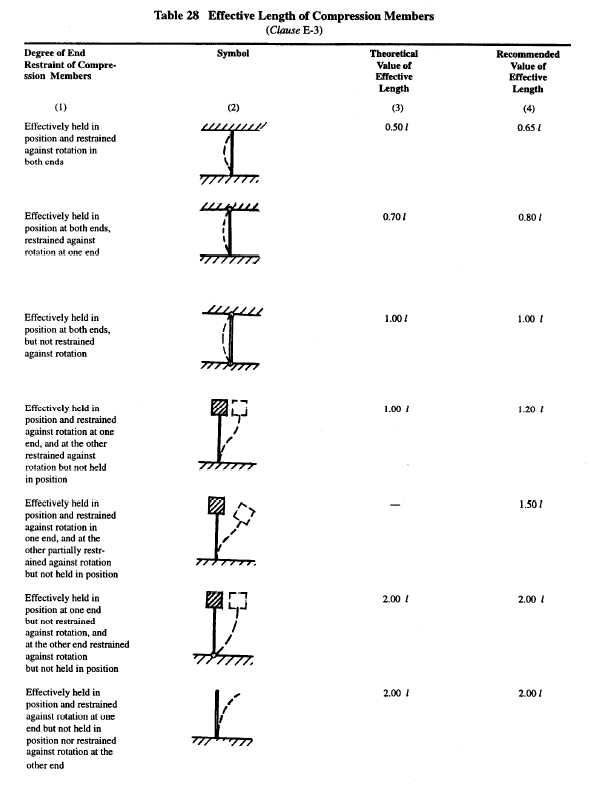
**Members Subjected to Combined Axial Load and Biaxial Bending [Is 456 39.6]**

This ensure that this that member is with in the Circle or curve dose not fail

***= Pu/ Puz***

***Puz =*** 0.45fck Ac + 0.75 fy Asc  

**Effective Length [ Annex E ]**

As PER Table 28 

Check ratio of tensile reinforcement

Calculate Neutral axis  **[ANNEX G]**

Calculate Moment Capacity  **[ANNEX G]**

Concrete Shear Capacity   **[40.4 c] [T table 19]**

Reinforce Shear Capacity   **[40.4 c]**

Calculate Moment Capacity compression steel  **[ANNEX G 1-2]**

xu.max the limiting value of xU **xu.max**  **[38.1]**

***Stress in Compression Steel fsc*  [Annex G 1.2]**

Minimum shear reinforcement **[26.5.1.6]**

Design Shear Strength of Concrete ***Tc [Table 19]***

*Shear Strength of Concrete* ***Tc*** ***[sp 24 39.2.1]***

*Shear Strength of Concrete Tcmax*  *[Table 20 , sp 16 pno124]*

***Xu / d Limit [Table 20 , sp 16 pno124]***

**Splicing**  **[26.5.5.1]**

Lap splices

Ø ≤ 36 mm

If ø ≥ 36 mm provide spirals around lapped bar

++

**Maximum Allowable Spacing of shear steel [26.5.1.5]**

Min of below

0.75 d

300

***Minimum Distance between Individual Bars [*26.3.2]**

Not greater than this :

Dia of Large Bar

5mm + 20aggregate size