

Chapter VII

CONCLUSION AND RECOMMENDATION

The strength of spaced columns of type 'a' are only 38 to 66 per cent and those of type 'b' are about 55 to 83 per cent of the tested strength of solid columns of the same cross-sectional areas and lengths as shown in Table 5.8. Spaced columns of type 'a' and type 'b' are being of 1.87 to 2.70 and 2.53 to 4.02 greater than the computed strength from Euler formula of solid column having the same cross-sectional areas and slenderness ratios respectively (Table 5.7). The working load computed from empirical formulas as shown in equations (16) and (17) are reasonably safe and lateral deflection at mid height is less than 0.002 of column height.

The tested deflection shape of solid column is conformed with the theoretical deflection shape of equation (5), while that of spaced columns is absolutely different. The point of inflection is between the third point of column length and the middle length between end and middle spacer blocks.

It is recommended that safe load of spaced columns should be used when lateral buckling at mid height is less than $1/500$, where l is expressed in centimeter. To have the safety factor of 2.00, considering maximum load, for spaced columns of type 'a' and type 'b' the following equations are introduced:

$$\frac{P}{A} = \frac{0.77E}{(l/d)^2} \quad \text{.....type 'a',}$$

$$\frac{P}{A} = \frac{1.04E}{(l/d)^2} \dots\dots\dots\text{type 'b'}$$

The Perry-Robertson formula is considered the most suitable formula for the strength calculation of Takian-Tong solid column by using $n = 0.003 l/r$.