PART 6 MEMBERS SUBJECT TO AXIAL COMPRESSION

6.1 General

Values of the design member capacity in compression (ϕN_c) for buckling about each principal axis for a range of effective lengths (l_e) are given in Tables 6-1 to 6-12. The design member capacities are determined using Section 6 of AS 4100. Many tables are supplemented by graphs of ϕN_c versus l_e placed consecutively after the tables for each corresponding grade and section type. All loads are assumed to be applied through the centroid of the section.

The tables in this section have been grouped into two series:

– the (A) series for the member buckling about the x-axis, and

– the (B) series for the member buckling about the y-axis

The (A) series tables and graphs for each group of sections are immediately followed by the (B) series of tables and graphs for the same group.

6.2 Design Section Capacity in Axial Compression

The design section capacity in compression (ϕN_s) is obtained from Clause 6.2 of AS 4100 and is given by:

$$\phi N_s = \phi k_f A_n f_y$$

where ϕ = 0.9 (Table 3.4 of AS 4100)

k_f = form factor (see Section 3.2.2.3 of this Publication)

A_n = net area of the cross section

= gross area assuming no penetrations or holes (see Tables in Part 3)

f_y = yield stress used in design *(for sections where the flange and web yield stresses (f_{yf} & f_{yw}) differ, the **lower** value is applied to the entire cross-section in the above equation for ϕN_s).*

The design section capacity considers the behaviour of the cross-section only (as in a stub column test), and is affected by the slenderness of each plate element in the cross-section. The form factor (k_f) represents the proportion of the area of the section that is effective in axial compression and is determined from considerations of element slenderness as affected by local buckling, using Clause 6.2.3 and 6.2.4 of AS 4100. See discussion in Section 3.2.2.3.