

## 6.4 Effective Length

The values of  $\phi N_c$  are based on the effective length ( $l_e$ ) of the member. The effective length depends on the member length ( $l$ ) and rotational and translational restraints at the ends of the member and is determined from the following formula:

$$l_e = k_e l$$

The member effective length factor ( $k_e$ ) for use in Clause 6.3.2 of AS 4100 can be determined using Clause 4.6.3 of AS 4100 or by a rational frame buckling analysis (Clause 4.7 of AS 4100).

$k_e$  is given in Figure 6.1 for members with idealised end restraints (Figure 4.6.3.2 of AS 4100). For braced or sway members in frames,  $k_e$  depends on the ratio ( $\gamma$ ) of the compression member stiffness to the end restraint stiffness, calculated at each end of the member. Example 2 of Section 4.3 provides a sample calculation of  $k_e$  for columns in an unbraced plane frame.



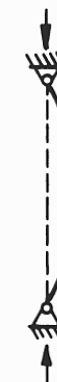


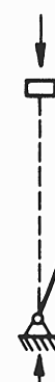




Buckled Shape	Braced Member			Sway Member		
						
Effective length factor ( $k_e$ )	0.7	0.85	1.0	1.2	2.2	2.2
Symbols for end restraint conditions	 = Rotation fixed, translation fixed  = Rotation free, translation fixed			 = Rotation fixed, translation free  = Rotation free, translation free		

Figure 6.1: Effective Length Factors for Members with Idealised Conditions of End Restraint (Figure 4.6.3.2 of AS 4100)