The symbol f denotes the permissible stress value of the material, which for timber flexural members is the grade bending stress $\sigma_{m,g,par}$ modified by any relevant K factors. These are the previously mentioned K_2 exposure factor (when applicable), the K_3 load duration factor and the K_8 load sharing factor (if applicable), together with a depth factor K_7.

The depth factor K_7 is necessary because the grade bending stresses given in Table 2.2 only apply to timber sections with a depth h of 300 mm. For depths of 72 mm or less the grade bending stress should be multiplied by a K_7 factor of 1.17. For depths h greater than 72 mm and less than 300 mm the grade bending stress has to be multiplied by a depth factor K_7 obtained from the following expression:

$$K_7 = \left(\frac{300}{h}\right)^{0.11}$$

Values of K_7 computed from this expression for the range of sawn, planed and regularized timber sections generally available are given in Table 2.7.

Table 2.7 Modification factor K_7 for depth

h	$K_7 = (300/h)^{0.11}$
72	1.170
75	1.165
97	1.132
100	1.128
120	1.106
122	1.104
125	1.101
145	1.083
147	1.082
150	1.079
169	1.065
170	1.064
175	1.061
194	1.049
195	1.049
200	1.046
219	1.035
220	1.034
225	1.032
244	1.023
245	1.023
250	1.020
294	1.002
295	1.002
300	1.000

Thus the expression for calculating the section modulus Z_{xx} for timber members, incorporating all the K factors, is as follows:

$$Z_{xx} \text{ required} = \frac{M}{\sigma_{m,g,par} K_2 K_3 K_7 K_8}$$

A suitable section size having a Z_{xx} greater than that required may then be chosen from one of BS 5268 Tables 98, 99 or 100. The chosen section should then be checked for deflection and shear.

It is also necessary to ensure that whilst the member is bending vertically, lateral buckling failure is not induced. To avoid such failure, the recommended depth to breadth ratio values given in BS 5268 Table 19 should be complied with. This table is reproduced here as Table 2.8.

Table 2.8 Maximum depth to breadth ratios (solid and laminated members) (BS 5268 Part 2 1988 Table 19)

Degree of lateral support	Maximum depth to breadth ratio
No lateral support	2
Ends held in position	3
Ends held in position and member held in line as by purlins or tie rods at centres not more than 30 times breadth of the member	4
Ends held in position and compression edge held in line, as by direct connection of sheathing, deck or joists	5
Ends held in position and compression edge held in line, as by direct connection of sheathing, deck or joists, together with adequate bridging or blocking spaced at intervals not exceeding 6 times the depth	6
Ends held in position and both edges held firmly in line	7

2.12.2 Deflection

To avoid damage to finishes, ceilings, partitions and so on, the deflection of timber flexural members when fully loaded should be limited to 0.003 of the span. In addition, for longer span domestic floors (over 4.67 m) the maximum deflection should not exceed 14 mm. That is, the permissible deflection δ_p is as follows:

Generally.

$$\delta_p = 0.003 \times \text{span}$$

For long span domestic floors:

$$\delta_p = 0.003 \times \text{span} \quad \text{but} \not> 14\,\text{mm}$$