

**Table 3.6** Nominal cover to all reinforcement (including links) to meet durability requirements (BS 8110 Part 1 1985 Table 3.4)

Conditions of exposure‡	Nominal cover (mm)				
	25	20	20*	20*	20*
Mild	—	35	30	25	20
Moderate	—	—	40	30	25
Severe	—	—	50†	40†	30
Very severe	—	—	—	60†	50
Extreme	—	—	—	—	—
Maximum free water/cement ratio	0.65	0.60	0.55	0.50	0.45
Minimum cement content (kg/m <sup>3</sup> )	275	300	325	350	400
Lowest grade of concrete	C30	C35	C40	C45	C50

\*These covers may be reduced to 15 mm provided that the nominal maximum size of aggregate does not exceed 15 mm.

† Where concrete is subject to freezing whilst wet, air-entrainment should be used (see clause 3.3.4.2 of BS 8110).

‡ For conditions of exposure see Table 3.5 of this chapter.

Note 1: This table relates to normal-weight aggregate of 20 mm nominal maximum size.

Note 2: For concrete used in foundations to low rise construction (see clause 6.2.4.1 of BS 8110).

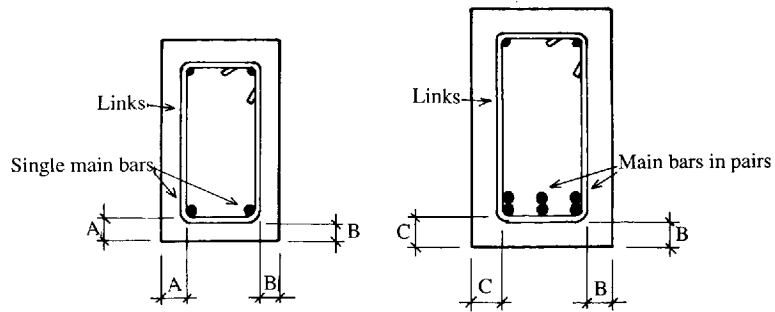
Two points should be noted. First, the cover stipulated is that to all reinforcement including any links. Secondly, the values are nominal and therefore under certain circumstances may have to be increased.

The amount of cover should also comply with recommendations given in BS 8110 relating to bar size, to aggregate size and to situations where the concrete is cast against uneven surfaces. It must also allow for any surface treatment, such as bush hammering, that would reduce the nominal thickness.

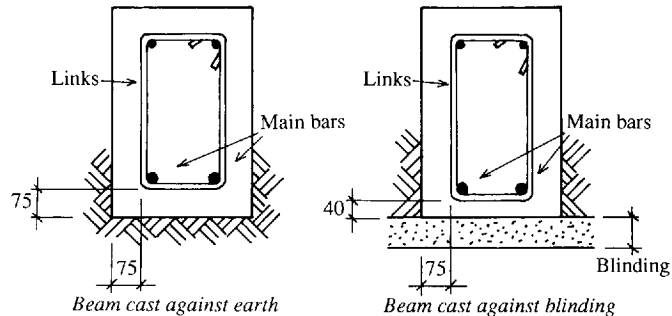
A summary of the requirements for cover is given in Table 3.7, and typical examples are illustrated in Figure 3.2.

**Table 3.7** Summary of cover requirements (other than for fire resistance): cover to any bar, including links, is the greatest of the relevant values

Circumstances	Cover
Generally	Nominal value from Table 3.6
Relative to aggregate	Size of coarse aggregate
Resulting cover to single main bars	Bar diameter
Resulting cover to bundles of main bars	Bar diameter equivalent to area of group
Concrete cast against earth	75 mm
Concrete cast against blinding	40 mm



A = Cover to a single main bar  $\nless$  bar diameter  
 B = Nominal cover to links  $\nless$  value from Table 3.6  $\nless$  aggregate size  
 C = Cover to group of main bars  $\nless$  bar diameter equivalent to area of group



Note:

For simplicity only beams have been used to illustrate the requirements for cover although similar requirements apply to other concrete members.

**Figure 3.2** Typical examples of cover to reinforcement

### 3.7.3 Fire resistance

The fire resistance of a reinforced concrete member is dependent upon the cover to reinforcement, the type of aggregate that is used and the minimum dimensions of the member.

Nominal cover provided for protection against corrosion may, in certain circumstances, not suffice as fire protection. Reference should be made to BS 8110 Part 1 Table 3.5 and Figure 3.2 for the amount of cover and minimum member dimensions to satisfy fire resistance requirements.

Further guidance on design for fire, including information on surface treatments, is given in Section 4 of BS 8110 Part 2.

## 3.8 Flexural members

Flexural members are those subjected to bending, for example beams and slabs. Primarily the same procedure appertains to the design of both,