5.2.3 Bending moments and shear forces

5.2.3.1 General

Slabs should be designed to withstand the most unfavourable arrangements of design loads. For continuous slabs subjected to predominantly uniformly distributed loads it will be sufficient to consider only the following arrangements of loads for ultimate state verification:

- Alternate spans carrying the maximum design dead and imposed load (i.e. $1.35G_k + 1.5Q_k$), other spans carrying the maximum design dead load (i.e. $1.35G_k$).
- All spans carrying the maximum design dead and imposed load (i.e. $1.35G_k + 1.5Q_k$). The moments obtained from elastic analysis may be redistributed up to a maximum of 30% except for plain or indented fabric for which the limit is 15%.

It should be noted that:

- the resulting distribution of moments should remain in equilibrium with the applied load
- the design redistributed moment at any section should not be less than 70% of the elastic moment
- there are limitations in the depth of the neutral axis of the section depending on the percentage of redistribution (see Section 5.2.4.1).

Concentrated loads

The bending moment arising from a concentrated load may be distributed over a width of slab equal to the width of the load plus the lesser of the actual width or $1.2(1 - (x/l))x$ on each side of the load (see Figure 5.1), where x is the distance to the nearer support from the section under consideration, and l is the span.

5.2.3.2 One-way spanning slabs

For continuous slabs with a) substantially uniform loading b) dead load greater than or equal to imposed load and c) at least three spans that do not differ by more than 15%, the bending moments and shear forces may be calculated using the coefficients given in Table 5.2.

Table 5.2 Bending moments and shear forces for one-way slabs

	Simple		Continuous		Penultimate support	Interior spans	Interior supports
	End support	End span	End support	End span			
Moment	0	$0.086Fl$	$-0.04Fl$	$0.075Fl$	$-0.086Fl$	$0.063Fl$	$-0.063Fl$
Shear	$0.4F$	–	$0.46F$	–	$0.6F$	–	$0.5F$

Notes

a F is the total design ultimate load ($1.35G_k + 1.5Q_k$) for each span.

b l is the span.

Allowance has been made in the coefficients in Table 5.2 for 20% redistribution of moments.