Table 15 Ultimate shear stress v_c for flat slabs

$\frac{100 A_s}{bd}$	Effective depth, mm						
	150	175	200	225	250	300	≥400
0.25	0.54	0.52	0.50	0.49	0.48	0.46	0.42
0.50	0.68	0.66	0.64	0.62	0.59	0.57	0.53
0.75	0.76	0.75	0.72	0.70	0.69	0.64	0.61
1.00	0.86	0.83	0.80	0.78	0.75	0.72	0.67
1.50	0.98	0.95	0.91	0.88	0.86	0.83	0.76

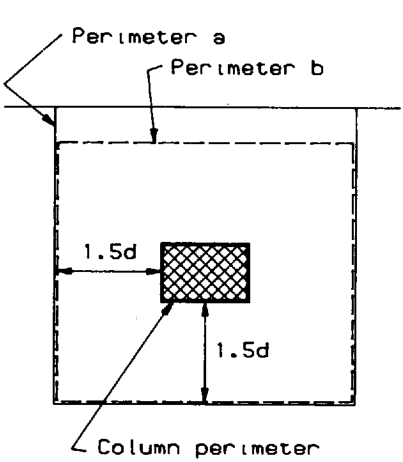
Note to Table 15
The tabulated values apply for f_{cu} = 30N/mm^2
For f_{cu} = 25N/mm^2 the tabulated values should be divided by 1.062.
For f_{cu} = 35N/mm^2 the tabulated values should be multiplied by 1.053.
For f_{cu} = 40N/mm^2 the tabulated values should be multiplied by 1.10.

If the shear stress exceeds v_c, shear reinforcement will be necessary, unless column heads or drop panels can be incorporated in the structure. Shear reinforcement should, however, not be used in slabs thinner than 250mm.

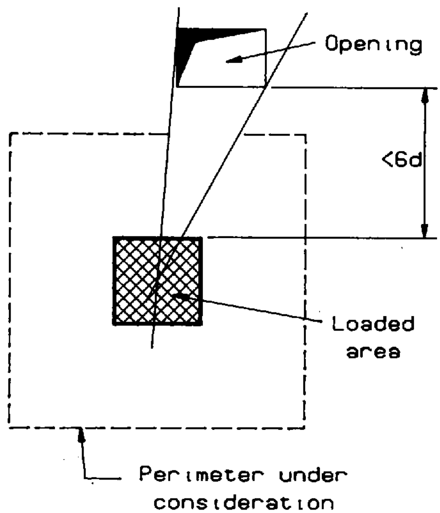
Shear reinforcement should consist of vertical links and the total area required is:

$$A_{sv} = \frac{(v - v_c)\, Ud}{0.87\, f_{yv}} \text{ mm}^2$$

where U is the perimeter in mm as previously defined
d is in mm and
f_{yv} is the characteristic strength of the shear reinforcement in N/mm^2.
$v - v_c$ should not be taken as less than 0.4N/mm^2. This reinforcement should be evenly distributed along two perimeters, the one on which v is calculated and the one $0.75d$ nearer the column face. In assessing the reinforcement required on a perimeter, any shear reinforcement on that perimeter which is derived from calculation on another perimeter may be taken into account.



8 Shear perimeter for edge column



9 Effect of opening on shear perimeter

4.2.5.3 Openings
When openings in floors or roofs are required such openings should be trimmed where necessary by special beams or reinforcement so that the designed strength of the surrounding floor is not unduly impaired by the opening. Due regard should be paid to the possibility of diagonal cracks developing at the corners of openings.

The area of reinforcement interrupted by such openings should be replaced by an equivalent amount, half of which should be placed along each edge of the opening.

For flat slabs, openings in the column strips should be avoided.

4.2.6 Section design — ribbed and coffered slabs

4.2.6.1 Bending
The bending moments per metre width obtained for solid slabs from clause 4.2.3 should be multiplied by the spacing of the ribs to obtain the bending moments per rib.

The rib section should be checked to ensure that the moment of resistance is not exceeded by using the methods for beams described in subsection 4.4. The area of tension reinforcement should be obtained from the same subsection. Structural topping should contain the minimum reinforcement indicated for solid slabs.

4.2.6.2 Span/effective depth ratios
(a) **Ribbed or coffered slabs on linear supports**

The span/effective depth ratio should not exceed the appropriate value from Table 16, multiplied by the modification factor in Table 13.

Table 16 Span/effective depth ratios for ribbed and coffered slabs

	$b_w/b=1$	$b_w/b \leq 0.3$
cantilever	7	5.6
simply supported	20	16.0
continuous	26	20.8

Notes to Table 16
1. For spans in excess of 10m, the ratios should be multiplied by 10/(span in metres).
2. b_w is the average width of the ribs.
3. b is the effective flange width.
4. For values of b_w/b between 1 and 0.33, interpolate linearly between the values in the Table.

(b) **Coffered slabs on column supports**

The ratio of the longer span to the corresponding effective depth should not exceed the values for slabs on linear supports multiplied by 0.90.

4.2.6.3 Shear
The shear force per metre width obtained from clause 4.2.3 should be multiplied by the spacing of the ribs to obtain the shear force per rib.

The shear stress should be calculated from $v = \dfrac{1000V}{b_w d}$

where v = design shear stress in N/mm^2
V = design shear force arising from design ultimate loads per rib in kN
b_w = average width of the rib in mm
d = effective depth in mm.

If the shear stress v exceeds the permissible shear stress v_c in Table 15 then one of the following should be adopted: