Table 4.3 Requirements for mortar (BS 5628 Part 1 1978 Table 1)

Mortar designation	Type of mortar (proportion by volume)			Mean compressive strength at 28 days (N/mm²)	
	Cement:lime:sand	Masonry cement:sand	Cement:sand with plasticizer	Preliminary (laboratory) tests	Site tests
(i)	1:0 to $\frac{1}{4}$:3	—		16.0	11.0
(ii)	1:$\frac{1}{2}$:4 to 4$\frac{1}{2}$	1:2$\frac{1}{2}$ to 3$\frac{1}{2}$	1:3 to 4	6.5	4.5
(iii)	1:1:5 to 6	1:4 to 5	1:5 to 6	3.6	2.5
(iv)	1:2:8 to 9	1:5$\frac{1}{2}$ to 6$\frac{1}{2}$	1:7 to 8	1.5	1.0

Properties

Increasing strength

Increasing ability to accommodate movement, e.g. due to settlement, temperature and moisture changes

Increasing resistance to frost attack during construction →

Improvement in bond and consequent resistance to rain penetration ←

Direction of change in properties is shown by the arrows

Table 4.4   Wall ties (BS 5628 Part 3 1985 Table 9)

(a) Spacing of ties

Least leaf thickness (one or both) (mm)	Type of tie	Cavity width (mm)	Equivalent no. of ties per square metre	Spacing of ties (mm) Horizontally	Vertically
65 to 90	All	50 to 75	4.9	450	450
90 or more	See table (b)	50 to 150	2.5	900	450

(b) Selection of ties

		Type of tie in BS 1243	Cavity width (mm)
↑ Increasing strength	Increasing flexibility and sound insulation ↓	Vertical twist	150 or less
		Double triangle	75 or less
		Butterfly	75 or less

A DPC can be made from a wide variety of materials, and therefore the choice should be based on the required performance in relation to the known behaviour of the materials. Advice on the physical properties and performance of DPC materials is given in BS 5628 Part 3.

4.5   Design philosophy

The design approach employed in BS 5628 is based on limit state philosophy. In the context of load bearing masonry its objective is to ensure an acceptable probability that the ultimate limit state will not be exceeded. Thus for a masonry member, which will be either a wall or a column,

$$\text{Ultimate design strength} \geqslant \text{ultimate design load}$$

4.6   Safety factors

As previously explained in relation to concrete design, partial safety factors are applied separately to both the loads and the material stresses in limit state design.

4.7   Loads

The basic or characteristic load is adjusted by a partial safety factor to arrive at the ultimate design load acting on a wall.

4.7.1   Characteristic loads

The characteristic loads applicable to masonry design are the same as those defined for concrete design:

Characteristic dead load G_k The weight of the structure complete with finishes, fixtures and partitions, obtained from BS 648 'Schedule of weights of building materials'.