Table 4.7 Values of f_{vk0} and limiting values of f_{vk} for general-purpose mortar (EC6)[a]

Masonry unit	*Mortar*	f_{vk0} (N/mm²)	*Limiting* f_{vk} (N/mm²)	
Group 1 clay units	M10 to M20	0.3	1.7	
	M2.5 to M9	0.2	1.5	
	M1 to M2	0.1	1.2	
Group 1 units other than clay and natural stone	M10 to M20	0.2	1.7	
	M2.5 to M9	0.15	1.5	
	M1 to M2	0.1	1.2	
Group 1 natural stone units	M2.5 to M9	0.15	1.0	
	M1 to M2	0.1	1.0	
Group 2a clay units	M10 to M20	0.3	The lesser of longitudinal compressive or	1.4
	M2.5 to M9	0.2		1.2
	M1 to M2	0.1		1.0
Group 2a and Group 2b units other than clay and Group 2b clay units	M10 to M20	0.2		1.4
	M2.5 to M9	0.15		1.2
	M1 to M2	0.1		1.0
Group 3 clay units	M10 to M20	0.3	No limits other than given by equation (3.4) of EC6	
	M2.5 to M9	0.2		
	M1 to M2	0.1		

[a]For Group 2a and 2b masonry units, the longitudinal compressive strength of the units is taken to be the measured strength, with δ taken to be not greater than 1.0. When the longitudinal compressive strength can be expected to be greater than $0.15f_b$, by consideration of the pattern of holes, tests are not necessary.

(f) Deformation properties of masonry

It is stated that the stress-strain relationship for masonry is parabolic in form but may for design purposes be assumed as an approximation to be rectangular or parabolic-rectangular. The latter is a borrowing from reinforced concrete practice and may not be applicable to all kinds of masonry.

The modulus of elasticity to be assumed is the secant modulus at the serviceability limit, i.e. at one-third of the maximum load. Where the results of tests in accordance with the relevant European standard are not available E under service conditions and for use in structural analysis may be taken as $1000f_k$. It is further recommended that the E value should be multiplied by a factor of 0.6 when used in determining the serviceability limit state. A reduced E value is also to be adopted in relation to long-term loads. This may be estimated with reference to creep data.

In the absence of more precise data, the shear modulus may be assumed to be 40% of E.

(g) Creep, shrinkage and thermal expansion

A table is provided of approximate values to be used in the calculation of creep, shrinkage and thermal effects. However, as may be seen from Table 4.8 these values are given in terms of rather wide ranges so that it is difficult to apply them in particular cases in the absence of test results for the materials being used.

4.4.4 Section 4: design of masonry

(a) General stability

Initial provisions of this section call for overall stability of the structure to be considered. The plan layout of the building and the interconnection of

Table 4.8 Deformation properties of unreinforced masonry made with generalpurpose mortar (EC6).

Type of masonry unit	*Final creep coefficient*[a], ϕ_∞		*Final moisture expansion or shrinkage*[b] (mm/m)		*Coefficient of thermal expansion* (10^{-6}/K)	
	Range	*Design value*	*Range*	*Design value*	*Range*	*Design value*
Clay	0.5 to 1.5	1.0	−0.2 to +1.0	−[c]	4 to 8	6
Calcium silicate	1.0 to 2.0	1.5	−0.4 to −0.1	−0.2	7 to 11	9
Dense aggregate concrete and manufactured stone	1.0 to 2.0	1.5	−0.6 to −0.1	−0.2	6 to 12	10
Lightweight aggregate concrete	1.0 to 3.0	2.0	−1.0 to −0.2	−0.4[d] −0.2[e]	8 to 12	10
Autoclaved aggregate concrete	1.0 to 2.5	1.5	−0.4 to +0.2	−0.2	7 to 9	8
Natural stone	−[f]	0	−0.4 to +0.7	−0.1	3 to 12	7

[a]The final creep coefficient $\phi_\infty = \varepsilon_{c\infty}/\varepsilon_{el}$, where $\varepsilon_{c\infty}$ is the final creep strain and $\varepsilon_{el} = \sigma/E$.
[b]Where the final value of moisture expansion or shrinkage is shown 'minus' it indicates shortening and where 'plus' it indicates extension.
[c]Values depend upon the type of material concerned and a single design value cannot be given.
[d]Value given is for pumice and expanded clay aggregates.
[e]Value given is for lightweight aggregates other than pumice or expanded clay.
[f]Values are normally very low.