

Table 9.2: Partial factors: ultimate limit states for buildings

Case <sup>1)</sup>	Action	Symbol	Situations	
			P	T
Case A Loss of static equilibrium; strength of structural material or ground insignificant (see 9.4.1)	Permanent actions: self weight of structural and non-structural compo- nents, permanent actions caused by ground, ground-water and free water – unfavourable – favourable	$\gamma_{Gsup}^{4)}$	[1,10] <sup>2)</sup>	[1,00]
		$\gamma_{Ginf}^{4)}$	[0,90] <sup>2)</sup>	[1,00]
	Variable actions – unfavourable	$\gamma_Q$	[1,50]	[1,00]
	Accidental actions	$\gamma_A$		[1,00]
Case B <sup>5)</sup> Failure of structure or struc- tural elements, including those of the footing, piles, basement walls etc., governed by strength of structural material (see 9.4.1)	Permanent actions <sup>6)</sup> (see above) – unfavourable – favourable	$\gamma_{Gsup}^{4)}$	[1,35] <sup>3)</sup>	[1,00]
		$\gamma_{Ginf}^{4)}$	[1,00] <sup>3)</sup>	[1,00]
	Variable actions – unfavourable	$\gamma_Q$	[1,50]	[1,00]
	Accidental actions	$\gamma_A$		[1,00]
Case C <sup>5)</sup> Failure in the ground	Permanent actions (see above) – unfavourable – favourable	$\gamma_{Gsup}^{4)}$	[1,00]	[1,00]
		$\gamma_{Ginf}^{4)}$	[1,00]	[1,00]
	Variable actions unfavourable	$\gamma_Q$	[1,30]	[1,00]
	Accidental actions	$\gamma_A$		[1,00]

P: Persistent situation      T: Transient situation      A: Accidental situation

- 1) The design should be verified for each case A, B and C separately as relevant.
- 2) In this verification the characteristic value of the unfavourable part of the permanent action is multiplied by the factor [1,1] and the favourable part by the factor [0,9]. More refined rules are given in ENV 1993 and ENV 1994.
- 3) In this verification the characteristic values of all permanent actions from one source are multiplied by [1,35] if the total resulting action effect is unfavourable and by [1,0] if the total resulting action effect is favourable.
- 4) In cases when the limit state is very sensitive to variations of permanent actions, the upper and lower characteristic values of these actions should be taken according to 4.2 (3).
- 5) For cases B and C the design ground properties may be different, see ENV 1997-1-1
- 6) Instead of using  $\gamma_Q$  (1,35) and  $\gamma_Q$  (1,50) for lateral earth pressure actions the design ground properties may be introduced in accordance with ENV 1997 and a model factor  $\gamma_{sd}$  is applied.

