

TABLE B1 (continued)

Criteria	Long-term effects	Short-term effects
Functionality	<p>Excessive floor slope may adversely affect occupancy requirements</p> <p>Differential deformations resulting from concentrated loads may cause localized depressions in the floor</p>	<p>Function or amenity may be adversely affected by unsatisfactory dynamic behaviour, and excessive deflections, or slope resulting in shaking, rattling, horizontal movement of furniture, etc.</p> <p><i>The dynamic response of floor systems including frequency of vibration should be considered. For lightly loaded floors in particular, the application of static live load deflection limits does not necessarily ensure satisfactory dynamic performance</i></p>
Damage	<p>Cracking/damage to ceilings and linings</p> <p>Differential deformation of longer span floor joists in close proximity to relatively rigid walls either above or below the floor</p> <p>Differential deformations resulting from concentrated loads may cause localized depressions in the floor, resulting in damage to roofs, partitions and floors above and partitions and floors below</p> <p>Damage to partitions—unintended load transfer to partitions caused by excessive deformations, may cause damage. To avoid this, an upper bound estimate of deflection may need to be calculated and appropriate clearances specified for construction (see Note 3)</p> <p><i>In evaluating the tendency for cracking or damage under long-term loading, considerations should be given to the sequence of construction and the creep deformation characteristics of the materials involved</i></p>	<p>Cracking/damage to ceilings and linings. In particular the differential deformation of joists running parallel and in close proximity to supports or relatively rigid walls may result in localized damage</p> <p>Differential deformations resulting from concentrated loads may cause localized depressions in the floor, resulting in damage to roofs, partitions and floors above and partitions and floors below</p> <p>The ability of the ceiling materials to resist cracking as a consequence of deformations needs to be considered in respect of the duration of load and appropriate limits applied</p> <p>Damage to partitions—unintended load transfer to partitions caused by excessive deformations, may cause damage. To avoid this, an upper bound estimate of deflection may need to be calculated and appropriate clearances specified for construction (see Note 3)</p>

NOTES:

- A1 1 Deformation includes both deflection and rotation. For a simply supported uniformly loaded beam a deflection of span / 300 corresponds to an end rotation of 0.01 radians. For a 500 mm deep beam this corresponds to 5 mm relative horizontal displacement at the ends which could be significant in respect of appearance, function or damage.
- 2 Camber may be used in certain circumstances, to reduce the visual effects of deflection or to prevent ponding. However, camber does not reduce the actual amount of deflection due to load effects and its use in design to allow for larger deflections (or smaller sizes) may lead to other undesirable effects, such as larger than acceptable end rotations or significant mis-alignment of other building elements. The inappropriate use of camber to facilitate larger than normal deflections can also result in construction complexities.
- A2 3 Where clearances between building elements must be maintained (e.g. where undesirable load paths could lead to damage or loss of function, such as doors or windows jamming or being damaged) then it is recommended that an upper bound estimate of deflection be calculated and an appropriate clearance specified. An upper bound estimate of deflection may be obtained using a lower fifth percentile estimate of modulus of elasticity rather than the average values given elsewhere in this Standard. In the absence of more precise information a rough estimate of the lower fifth percentile values of modulus of elasticity may be calculated as a proportion of the average modulus of elasticity, as follows:
- A2 (a) For F-grades of timber graded in accordance with AS 2082, AS 2858 $E_{0.05} \approx 0.5 E_{\text{average}}$
- (b) For MGP grades and F-grades of timber graded in accordance with AS 1748 $E_{0.05} \approx 0.7 E_{\text{average}}$
- (c) For F-grades of plywood to AS/NZS 2269, GL grades for glulam to AS/NZS 1328 $E_{0.05} \approx 0.75 E_{\text{average}}$
- (d) For LVL to AS/NZS 4357 $E_{0.05} \approx 0.85 E_{\text{average}}$
- (e) For A17 grade of timber graded in accordance with AS 2082 $E_{0.05} \approx 0.7 E_{\text{average}}$