# TECHNICAL UPDATE

## FLOOR LEVELS

**Floor levels**

This technical article provides additional guidance on the floor levels. It is important that all workmanship carried out during construction is completed in accordance with the relevant tolerances.

One might think this is pretty obvious, but a floor should be level! However, once you take account of shrinkage, occasional poor workmanship and deflection, as with flat-roof designs, the difference between a designed level and actual level outcome can result in potential problems at completion stage.

The LABC Warranty Technical Manual makes reference to floor levels in Section 1 Tolerances.

It gives a recommendation that, 'Floors up to 6m across can be a maximum of 4mm out of level per metre and a maximum of 25mm overall for larger spans'.

Therefore, it is important when floors are constructed, particularly upper (intermediate) floors, that the setting out of the supporting elements to the floor (walls, beams, etc.) is checked before the floor is put in position. Any 'out of levelness' that is built in at this stage will still be apparent when the floor boarding is installed, particularly in the case of timber floors. Shimms or packing should be avoided as these can also shrink and become loose.

On concrete floors, the levelness can be corrected to a degree with screeding. However, that should not result in the thickness of screed being below the recommended minimum thicknesses required to accommodate the out-of-'levelness'.

For the purposes of this article, additional guidance is provided for upper floors or intermediate floors. However, it can also be applicable to ground floors.

**Deflection**

A high majority of upper floors in housing is still timber-based and as stated above, shrinkage and poor workmanship can be a factor when finding a floor is 'too much out of level' post-completion. However, another key factor often ignored by designers and structural engineers is our warranty requirement for level of floors in Section 1 Tolerances.

A floor joist can be designed either by using TRADA Eurocode tables for timber joists or by calculation to be within permissible deflection parameters following the British Standard or Euro code, but this may still exceed the maximum out-of-level requirement as found in Section 1 Tolerances.

For example, a timber floor joist spanning 4m between supports that is provided with solid strutting can, if designed to BS 5268, have a maximum permissible deflection of 12mm. So at mid span (2m) there could be 12mm out-of-level and potentially at 1m intervals there could be a 6mm drop in level (per metre).

Although that amount is within design parameters under the BS, it would exceed the maximum out-of-level of 4mm per metre as required by our technical manual. Our tolerances section is based on industry standards within the warranty sector, so designers and engineers must take this in to account at the design stage.

Section 10: Upper floors of our Technical Manual also makes reference to the fact that although an upper floor may be in accordance with a design to a BS or Eurocode standard for deflection, the floor must be within the tolerances defined in Section 1.

It's not just timber floors this tolerance standard applies to. Concrete beam and block floors should also meet this requirement.

With all upper floors, deflection can also impact on the floor finishes, particularly rigid finishes such as ceramic tiling which may not be able to tolerate the permissible deflection parameters. See our technical article: Ceramic floor tiling on domestic timber floor constructions.

**Recommendations for our warranty purposes**

Designers and engineers must be made aware of our tolerances, as although the floor joist design may meet a relevant code or standard for deflection, it could result in a potential claim of exceeding the maximum out-of-level requirements as a defect of the Technical Manual within a policy's defects insurance period. This is applicable to buildings covered under the New Homes, Social Housing and Private Rental (PRS) policies.

*Every care was taken to ensure information in this article was correct at the time of writing (March 2021). Guidance provided does not replace the reader's professional judgement and any construction project should comply with the relevant building regulations or applicable technical standards. For the most up to date LABC Warranty technical guidance please refer to your risk management surveyor and the latest version of the LABC Warranty Technical Manual.*