

Why roof slopes of 1.0° should generally not be specified

Architectural drawings often specify a roof slope of 1°. Unfortunately, this can be problematic for the following reasons (and can sometimes result in slopes as low as 0°):

- (a) Where the roof is supported on the timber rafters which are parallel to the roof sheeting (i.e. there are timber roof battens perpendicular to the roof sheeting), deflections of the rafter will increase the roof slope at the high end and decrease the roof slope at the low end. This is indicated in the Figure 1 below, where it can be seen that, for a symmetrical loading (eg a uniformly distributed load), then

- The slope in the centre will be the slope of the rafter with no deflection
- The slope at the high end will increase by the rotation at the high end
- The slope at the low end will decrease by the rotation at the low end

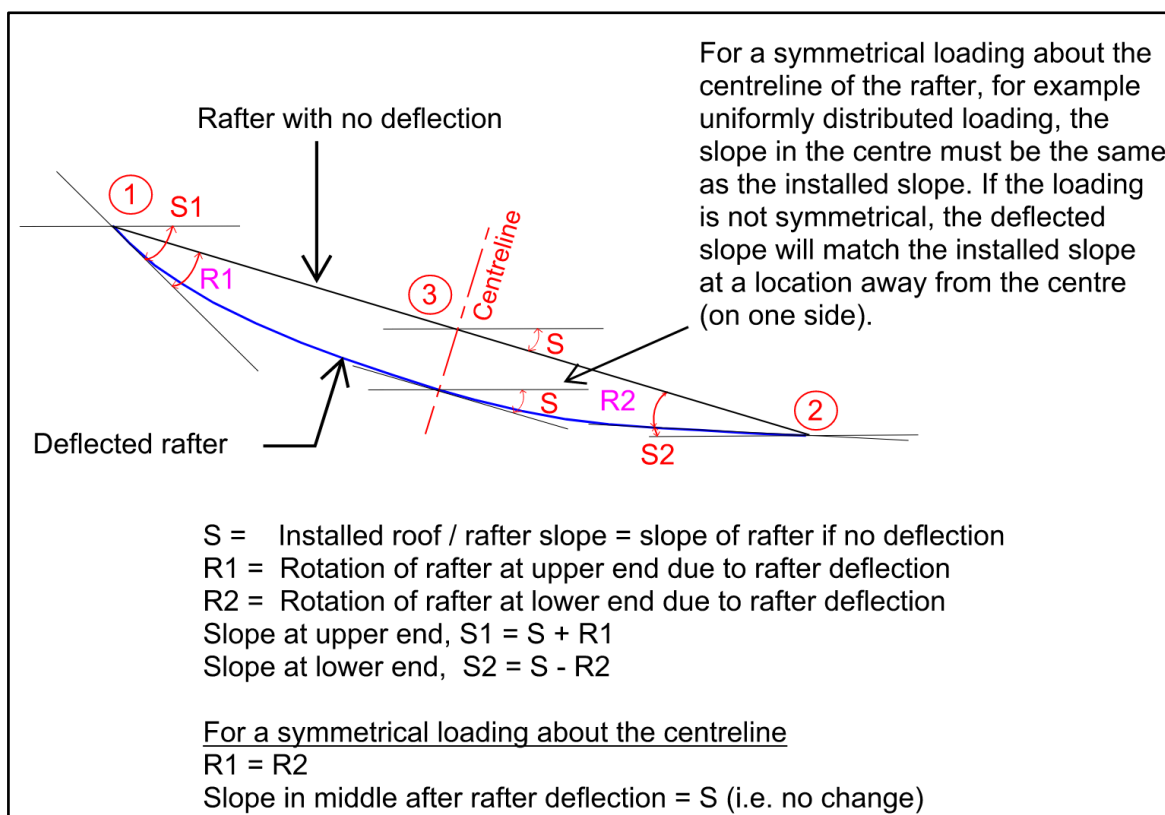


Figure 1 – Analysis of roof slopes due to rafter rotations

- (b) Even if adjustments are made to the battens during construction to compensate for the rafter rotations (i.e. deeper battens were used towards the centre of the rafters), long term creep deflection of the timber rafters would still occur. For seasoned timber (which is typically used) the short term (elastic) deflections due to dead loads approximatley double in the long term.
- (c) The problem is compounded if additional dead loads are added to the roof (such as due to solar panels or solar hot water services) after the roof sheeting has been installed
- (d) At slopes as low as 1 degree, the installed slope is more susceptible to being incorrectly installed due to construction tolerances
- (e) On reactive clay sites, differential foundation movements could potential affect very low roof slopes.