Camber	Published Date: 09/09/2009

Nearly all prestressed concrete flooring units will have a camber. This is an upwards curve due to the compressive prestressing force near the bottom of the unit.

Many factors affect the degree of camber, most importantly the span of the unit, the stiffness and self weight of the unit, and the amount of prestress. It is difficult to calculate with any real degree of accuracy due to other factors including the type of aggregate used, the method of initial storage, the age of the units, and even the weather. Variations in the concrete's modulus of elasticity, tolerances in cross section, and prestressing wire positions also contribute to this difficulty.

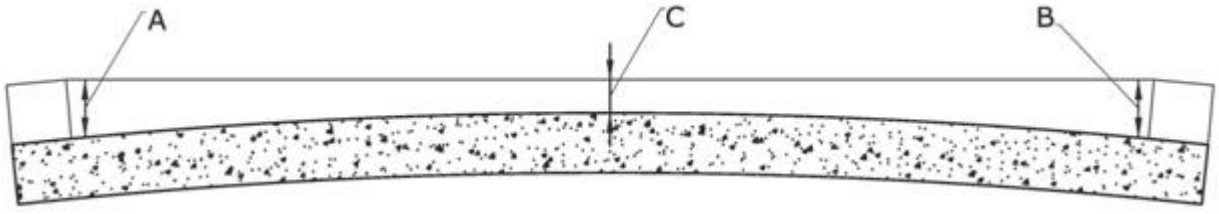
As a general guide however, it is normal to allow a figure of span/300. Thus for a 9m long unit, a camber of 9000/300 = 30mm might be expected. BS8110 requires that the actual camber should not exceed the predicted camber by more than 50%.

In a normal situation, it is unlikely that subsequent loading will have a significant effect of reducing the initial camber. It should therefore always be allowed for when planning finished floor levels. Rather than simply drawing two lines 200mm apart in the case of a 200mm deep unit, it is better to show a zone based on the nominal unit depth plus an allowance for camber based on the span/300 figure.

If a precast concrete floor unit is designed to work compositely with a structural topping, then it is important that the prescribed depth of topping is provided at the point of highest camber, i.e. midspan. This can result in much thicker topping depth near the supports, which may need to be considered in calculating dead loads.
If units of differing length are used in areas such as stair openings, then cambers will be different, and it may be necessary to adjust bearing levels to maintain a uniform soffit line. In practice, this may be difficult to achieve, especially if units have different curvatures, and it may be better to accept that some steps will occur at these locations.

Measuring camber:

It may be necessary on occasion to measure the actual camber on floor units. One method of doing this is to use a traditional survey with a level. However, this is time-consuming and is a two-man operation.
A more simple method is as follows.



Stretch a length of fishing line tightly across the span, raised off the surface of the unit. This can be achieved by simply wrapping around a brick or block. Take measurements A, B & C from the line to the unit. The camber is then given by

$$\frac{A+B}{2} - C$$

An advantage of this method is that it can be done single handedly.