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Attainment of Superelevation

Introducing superelevation on a horizontal curve in the field is an important feature in construction. The road cross section at the straight portion is cambered with the crown at the centre of the pavement and sloping down towards the edges. But the cross section in the circular curve portion of the road is superelevated with a uniform tilt sloping down from the outer edge of the pavement up to inner edge. These may be seen from sections at A and E of Fig. 4.24. Thus the crowned camber sections at the straight before the start of the transition curve should be changed to a single cross slope equal to the desired superelevation at the beginning of the circular curve. This change may be conveniently attained at a gradual and uniform rate throughout the transition length of the horizontal curve. The full superelevation is attained by the end of transition curve or at the beginning of the circular curve.

The attainment of superelevation may be split up into two parts :

- (a) Elimination of crown of the cambered section
- (b) Rotation of pavement to attain full superelevation

Elimination of crown of the cambered section

This may be done by two methods. In the first method, the outer half of the cross slope is rotated about the crown at a desired rate such that the surface falls on the same plane as the inner half and the elevation of the centre line is not altered. (Ref. Fig. 4.22a).

The outer half of the cross slope is brought to level or horizontal (by rotating about the crown line) at the start of the transition curve or at tangent point T.P. See cross section at B in Fig. 4.24. Subsequently the outer half is further rotated so as to obtain uniform cross slope equal to the camber, as shown in Fig. 4.22 (a) and in cross section C of Fig. 4.24.

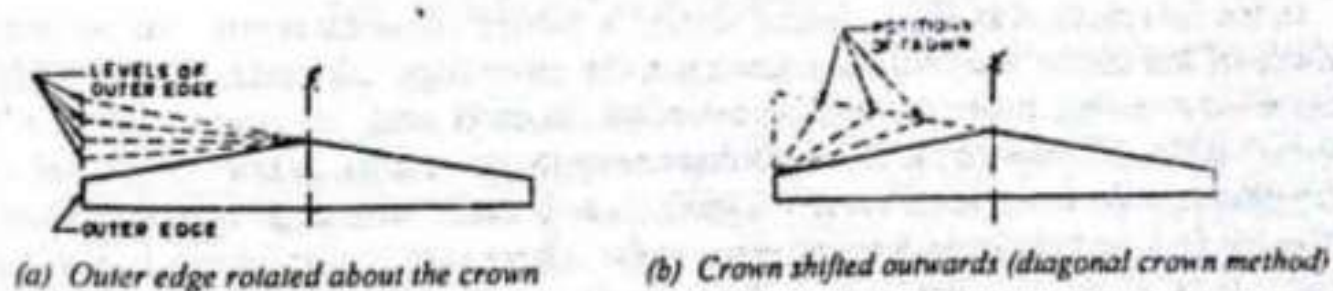


Fig. 4.22 Elimination of Crown of Cambered Section

Thus no point on the curve will have a negative superelevation at the outer half of the pavement event at the start of the transition curve. This method has a drawback that the surface drainage will not be proper at the outer half, during a short stretch of the road with a cross slope less than the camber between point A and C in Fig. 4.24.

In the second method of eliminating the crown, known as diagonal crown method, the crown is progressively shifted outwards, thus increasing the width of the inner half of cross section progressively. This method is not usually adopted as a portion of the outer half of the pavement has increasing values of negative superelevation on to a portion of the outer half, before the crown is eliminated (see Fig. 4.22 b).