

What is Camber in Road? Types, Advantages Disadvantages of Camber

What is camber in Road?

The cross slope (Transverse slope) provided to the road surface to remove rainwater from the surface is known as camber in road.

Let us discuss in detail.

Why is camber provided in the road?

Objective or advantages of Camber in Road

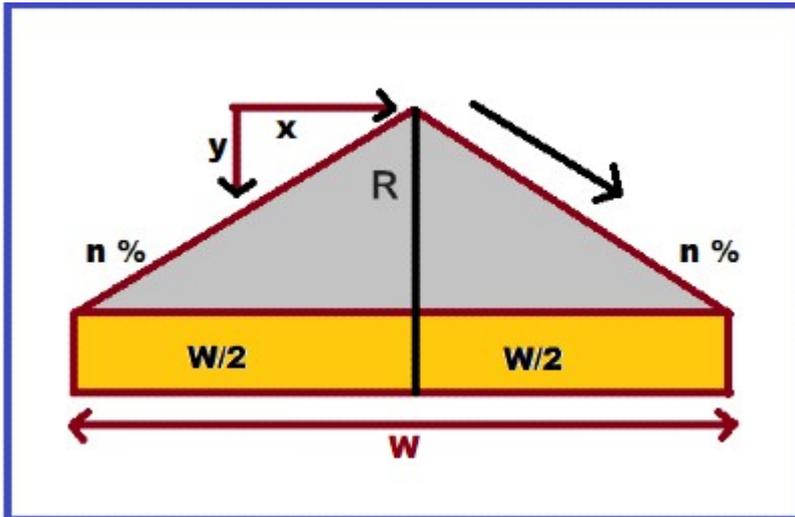
- 1) It is provided on the road surface to remove rainwater and hence prevent the entry of rainwater pavement of subgrade.
- 2) It also protects upgrade settlement and stripping of pavement.
- 3) To remove the rainwater from the pavement surface as quickly as possible and allow the pavement to get dry soon after the rain.
- 4) It also improves skid resistance.

Types of camber in road

There are mainly three types of camber

1. Straight-line camber
2. Parabolic camber
3. Composite camber

Straight line camber



Straight line camber

A camber of two equal straight line slopes called straight line camber.

$$n = \tan(\theta)$$

$$= R/(W/2) \text{ ---(i)}$$

$$\tan(\theta) = y/x \text{ ---(ii)}$$

From relation (i) and (ii)

$$(y/x) = 2R/W$$

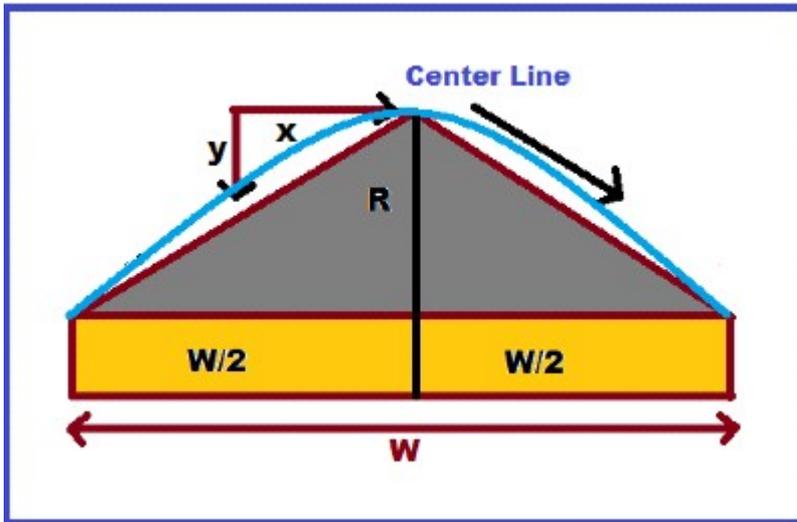
$$y = (2R/W) * x$$

$$y = n * x$$

Where n is Camber required in percentage.

where, R is radius, W is total width of road

Parabolic camber



Parabolic camber

$$y / x^2 = R / (W/2)^2$$

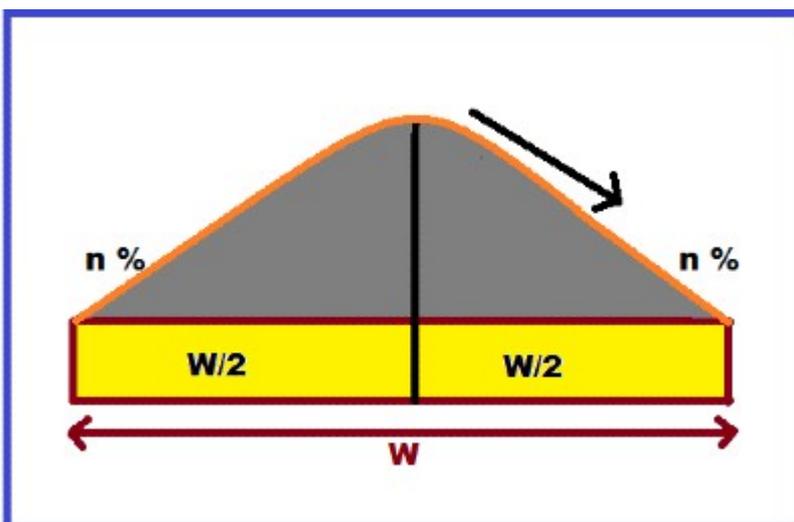
$$y = (4 * R) / (W^2) * x^2$$

$$y = ((2 * x) / W) * x^2$$

Where, R is radius, W is total width of road

A camber with the shape of simple quadratic parabola may be referred to as parabolic camber. It is provided in a low cost and single lane/double lane road.

Composite camber



Composite camber

The camber which may be either composed of partly parabola and partly straight or two straight lines having different

slope is known as the composite camber.

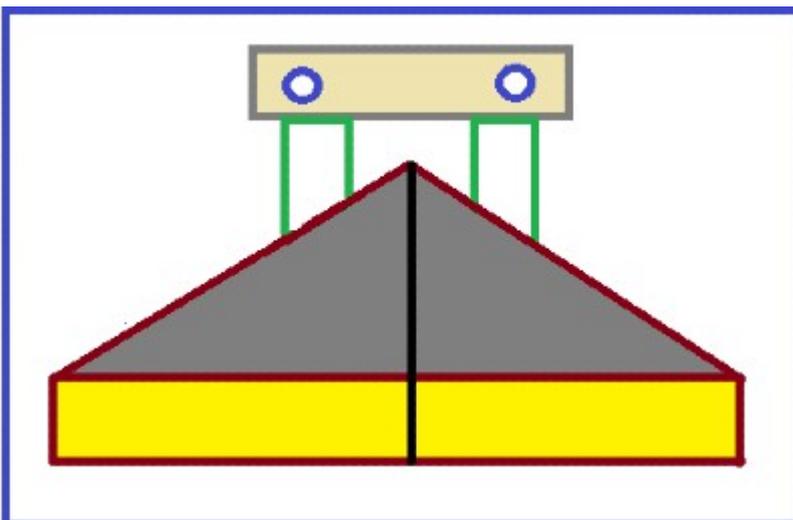
The disadvantage of heavy camber

Traffic needs no camber from a traffic operation point of view. The present of camber is undesirable because it drags the vehicles sideways.

But we have already discussed that camber is also necessary for other consideration.

So the appropriate value of camber is desired but heavy camber has got the following disadvantages.

1) To counteract or neutralize the effect of heavy camber driver wants to use the central track as shown in the figure.



Due to this:-

- The possibility of an accident is high
- The central portion of the road surface on one and the same wheel track gets excessively worn.
- Due to the rigidity of wheelbase, wear and tear of tires are also high.

2) The transverse tilt of vehicles causes uncomfortable side thrust and drag on the steering of the vehicle.

3) In double roads presence of crown due to the provision of

camber makes the overtaking operation more dangerous due to the “air born” effect, possibly especially at high speed.

4) low-cost surface and shoulder will be excessively eroded due to the increased velocity of surface water. This leads to the formation of cross ruts.

5) In steep camber, there is the possibility of the overturning of the vehicle.

A typical value of camber with a reference standard of Indian road (IRC) :-

Earthen Road	3-4 %
Gravel or WBM road	2.5-3%
Bituminous road	2.5%
Asphalt concrete or Cement concrete road	2%

A typical value of camber with the reference standard of Nepal (NRS) road:-

Earthen Road	5%
Gravel or WBM road	4%
Bituminous road	2.5%
Asphalt concrete or Cement concrete road	1.5-2%

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Advantages And Disadvantages of Road Transport (Highway)

Overtaking Sight Distance- Derivation and Numerical Example

Ductility test of bitumen- Step by Step Full Procedure with Apparatus

Penetration test of bitumen- Step by Step Procedure and significance