Derivation of the maximum tilt angle for a cracked section of a seated girder

When the girder rotates towards the left, the resisting moment is

If the overturning moments are sufficient to cause the girder to rotate towards the right, the resisting moment is, with ,

To accommodate both cases (girder rotated towards right and left) take the resisting moment as

# Equilibrium Angle

Assume counterclockwise rotation

# Critical angle at rollover

Rollover about the left tire,

Rollover about the right tire,

Rollover about the right tire,