



How potholes are formed

For road users, potholes are not simply a nuisance. They constitute a dangerous safety hazard that can inflict substantial damage to vehicles. Potholes can cause drivers to veer suddenly in traffic or even cause the driver to lose control of the vehicle after contact.

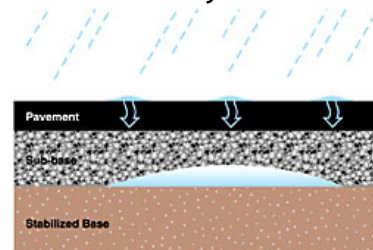


Potholes are a serious problem and their effective repair is an important issue. Emcol licensees know that Emcol IRR represents a reliable, easy to use and durable solution for the repair of potholes. But, what is a pothole and how does it form?

A definition of a pothole is given in the US Federal Highway Authority's "Distress Identification Manual for Long-Term Pavement Performance". Here, potholes are described as bowl-shaped holes of various sizes in the road pavement surface, with a minimum width of 15cm. Low-severity potholes are less than 2.5cm deep, moderate-severity from 2.5cm to 5cm deep and high-severity potholes are deeper than 5cm.

Pothole formation is always associated with asphalt fatigue damage. High-severity potholes will most commonly appear in late Winter or early Spring, depending upon weather conditions, after a series of freeze-thaw cycles.

When an asphalt road pavement ages, it becomes more porous and rainwater increasingly begins to penetrate through cracks and other flaws. Additionally, water may enter the road base from the sides of the road. In colder weather conditions when sub-zero temperatures occur, the water



which has drained through to the road base or foundation layer freezes to form pockets of ice.

When water freezes to become ice, it expands. This expansion, or increase in volume, begins to displace the road pavement surface. When the temperature subsequently rises above freezing, the pockets of ice melt leaving voids beneath the road surface.

A succession of freeze-thaw cycles gradually increases the size of these sub-pavement voids, progressively weakening the road pavement layer. Traffic loads over the un-supported pavement cause collapse and the formation of a pothole.

Once a pothole has been formed, it will tend to grow in size because traffic will continually remove broken pieces of the road surface. If the pothole fills with water, its rate of growth will accelerate as the water will wash away loose particles under the force of passing traffic. Whilst potholes can grow to perhaps half a metre in width, they will usually only become a few centimetres in depth. Nonetheless, if potholes become large enough, they can cause damage to vehicle tyres and suspensions.

