

OVERVIEW

Potholes are typically formed when water enters the pavement either through isolated weak spots or permeates through cracks in the bitumen.

A wet pavement is a weak pavement.

Potholes in Local Government roads are inevitable because;

1. Roads are designed and constructed as flexible pavements, that is they deflect and rebound (less than 1mm) under heavy loads. The sealed surface is aged by direct exposure to sunlight which has the effect of making the bitumen brittle and thus it cracks when deflected.
2. Initial earthworks before any pavement is constructed tries to remove all weak spots in the ground so that compaction of gravel can be effective. Despite best efforts ground conditions can be quite variable and thus this is rarely a perfect outcome and so weak spots often exist in a freshly constructed pavement.

With potholes being inevitable the primary objectives when managing a road network is to;

1. Replace the sealed surface by resealing the pavement before cracks become too large (ie visible to the naked eye) and thus eliminate (reduce) water ingress.
2. Given that potholes will occur, reconstruct the pavement when patching of the surface gets to about 10% of the surface area.

If these objectives **are achieved** pothole repairing is a planned and managed exercise.



The key steps in **POTHOLE REPAIRING** are;

1. Squaring up the pothole to remove any loose material and provide for a uniformly thick layer of repair material to be applied
2. Sealing the squared-up hole with a bitumen emulsion
3. Placing pavement material in uniformly thick layers and compacting with a vibrating machine

This process can take between 30-60 minutes for each pothole set up, and these repairs can last for years.

If the road network primary objectives **aren't achieved** potholing increases. If these objectives aren't achieved **AND** extended rain occurs such as back to back La Nina's, potholing becomes extensive.

When potholing becomes extensive the pavement can become hazardous to drive on and thus **pothole filling** is required. The objective of pothole filling being to make the pavement as safe as possible as quickly as possible by eliminating as many hazards as quickly as possible and thus there is no time to carry out a pothole repair in these circumstances.

The key steps in **POTHOLE FILLING** are;

1. Place filler material in the pothole and compact with hand tools.

This process can take a few minutes for each pothole but unfortunately the repair only lasts a few weeks or even a few days if more rain occurs.

When the road network has extensive potholing roads are regularly patrolled and filling occurs and reoccurs where required. This is a very inefficient cycle (particularly if rain is ongoing) and can really only be stopped by developing an extensive pavement reconstruction program.

PAVEMENT RECONSTRUCTION involves the following specialised resources

1. Sampling and testing and design experts
2. Pavement construction crews
3. Pavement sealing crews
4. Line marking crews

In a typical reconstruction program Council has internal staff and contractors/subcontractors to do this work. The resources are coordinated and scheduled as efficiently as possible. Funding is planned and generally obtained through the “Council Rates” process. Work is generally conducted in the warmer months where the impact of rain during construction can be reduced by quicker drying times

In an extensive (natural disaster) reconstruction program these resources must be acquired at short notice and often in competition with other Local Government areas. In

addition to the physical resources additional funding must be obtained from the State and Federal Governments, and there are justification and approval process to follow here.

An extensive pavement reconstruction program can take around six months to arrange, even longer if rain persists locally or the rain effects more than one Council or if Winter becomes a factor

The key to avoiding a road network with extensive potholes and thus avoiding expensive and inefficient maintenance cost is to;

1. Have a robust quality control and assurance program when pavement is originally constructed. Anecdotal evidence suggests that this was not the case about 40 years ago, and the current “developer gifted” way that Council inherits new roads makes quality control very complex.

2. Reseal pavements before cracking becomes large enough to be visible with the naked eye.
3. Reconstruct pavements just before they reach their end of life.

