

Water causes rust...and other common myths

That water causes reinforcing steel to corrode (rust) in concrete is one of quite a few myths in need of dispatch.

Water causes it?

Even some "experts" will tell you how water that leaks through concrete slabs will automatically lead to corrosion of the reo.

While it is true that the corrosion reaction requires the presence of moisture, water alone won't do it!

Indeed, the adage that "good steel in good concrete does not rust" holds true.

The corrosion reaction also needs oxygen and either chloride ions at the steel or a loss in the alkalinity of the concrete at the depth of reinforcement (carbonation).

Cracks in concrete can at times lead to localised corrosion (because there is a direct path for the contaminants to get to the steel), but this is not always the case.

Sea must soak?

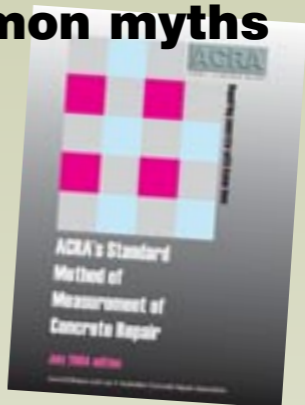
Another myth is that salt from the ocean can only get into concrete by direct contact with sea water.

To dispel this one, park your car near the beach and see in an hour how much salt is on your windscreen.

This salt is transported by wind in tiny droplets of spray. This deposits on buildings within 1 km (according to Australian Standards). There, it will "soak" into the concrete. And rain will wash it, concentrated, off into run-off areas.

The actual process whereby chloride ions from the salt water permeate the concrete is called "diffusion". With the ocean an abundant supply, the chloride ions are ever replenished at the surface and over time diffuse into the concrete. When these reach the reo, they attack the steel and corrosion starts.

Industrial processes, additives used in concrete in the



past and certain topical products such as magnesite can also introduce chloride ions to the concrete.

Lump sum best?

Another myth! While a lump sum price may give comfort in that you know what a repair project will cost, experience suggests that this is rarely the case and that it is rarely the most cost-effective.

ACRA just published *Standard Method of Measurement* (free from its website) giving guidelines on pricing concrete repair projects, allowing an "apples for apples" comparison of prices.

A detailed diagnosis of a structure followed by an estimate of quantities can allow an upper limit price to be calculated. The *SMM* and a price from a contractor on a "rates basis" allows this price to be reduced if there are less works involved (and vice versa).

A lump sum price without a specification and without an accurate estimate from an experienced engineer can count for nothing. What's included, what's not?

There are simple problems with concrete, and complex problems involving an array of materials and structural deterioration mechanisms.

Solutions to these problems are best formulated by an ACRA consultant experienced in the diagnosis of concrete and building defects.

If you think you know it all, test yourself with the eQuiz on ACRA's website. ■