

# BRIDGE DECK WATERPROOFING — A NEW DIRECTION



MY THUAN BRIDGE — MEKONG RIVER, VIETNAM

AFTER many years of successful waterproofing of high-risk, challenging commercial structures Radcon #7 is also in high demand for Bridge Deck waterproofing; and for good reasons!

Government authorities, given the massive investment to construct such structures, are anxious to reduce maintenance costs and protect their infrastructure investments - and are now specifying waterproofing to bridge decks and raised highway sections more so than ever before.

## MEMBRANES

As a traditional waterproofing method, membranes are a benchmark for many specifiers. That said, it is not the purpose of this article to denigrate membrane products - unfortunately, membranes are inherently problematic.

Membrane materials in high traffic areas require protection, a running surface of asphalt the preferred finish over the top of a bridge deck. This, in turn, creates major problems as membranes can delaminate causing potholes in the newly finished surface.

Membranes (that have failed under asphalt) may have passed all required tests in laboratories, met all other criteria and, even, obtained international certification as being "fit for purpose" as a result of such tests.

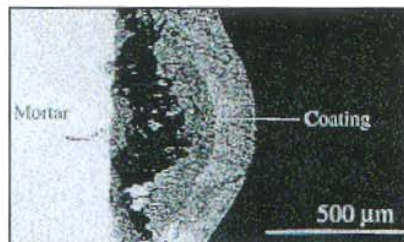
However, membrane applications in the field can lead to totally different outcomes.

## SCENARIO (1)

Wet weather has contributed to stalling the programme and pressure

has seen the membrane applied anyway so asphalt and site completion can be achieved.

- The membrane, which exhibited excellent adhesion to concrete and asphalt in the laboratory, is found to be bubbling up and failing on site.



SEM MICROGRAPH SHOWING A BLISTER IN A POLYURETHANE MEMBRANE

- The failure is not a product or application-detailing problem - the membrane was applied to a concrete surface that contained entrapped moisture.

A perfectly sealed membrane is not a breathing surface and so, as the heat from the sun drew vapour to the top of the slab (in effect, sweating), the membrane has been blown off to the point of delamination.

## SCENARIO (2)

A second issue is where water is entrapped between the asphalt and the top of the membrane (another common failure with membrane systems): -

- Asphalt is not totally waterproof so water will penetrate through until it reaches the membrane to which it is bonded.
- Membranes often specified for bridge decks are not tanking membranes and, as such, are not designed to be permanently ponded.
- In wet climates, on a flat bridge deck (or with very little camber) combined with hydraulic pressure due to traffic flow, membranes become permanently wet leading to asphalt delamination.

When major public infrastructures suffer membrane failures the 'bad news' can often become 'front page news'.

Authorities, representing public interest (and protecting their investment), must undertake lengthy recourse action which includes obtaining expert reports and, usually, litigious activity that often ends up in court. However, this is somewhat misdirected if the purpose is to gain compensation from the membrane supplier - in most instances the product has met spec and is fit for purpose.

Unfortunately, in efforts to achieve better building practice and reduce maintenance, usually it's the authorities who wear the cost of the remedial work - asphalt removal, membrane removal, repair and re-waterproofing - which is costlier than the original job given the high cost of removing failed membranes.

## RADCON #7

As demands for better Bridge Deck waterproofing approaches/ materials grow, Radcon #7, with or without

