

# Concrete and structures

## About ARRB:

ARRB Group Ltd (ARRB) provides research, consulting and information services to the road and transport industry. ARRB applies research outcomes to develop equipment that collects road and traffic information and software that assists with decision making across road networks. ARRB is the leading provider of road research and best practice workshops in Australia.

## ARRB Group Ltd

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# Concrete and structures

the largest and most experienced AAR team in Australia

With the largest and most experienced AAR team in Australia, ARRB Group can help save you money today.... and for 100 years to come.

ARRB Group has well known capabilities in the areas of inspection and condition assessment of structures such as bridges, jetties, buildings, dams, and concrete railway sleepers. In addition to visual inspection and assessment, many structures require additional testing. Diagnosis and assessment of deterioration problems, such as AAR, corrosion of steel reinforcement in concrete structures and sulfate attack are among our specialties. This is where ARRB offers additional skills.



Led by the world renowned expert Dr Ahmad Shayan we can assist with:

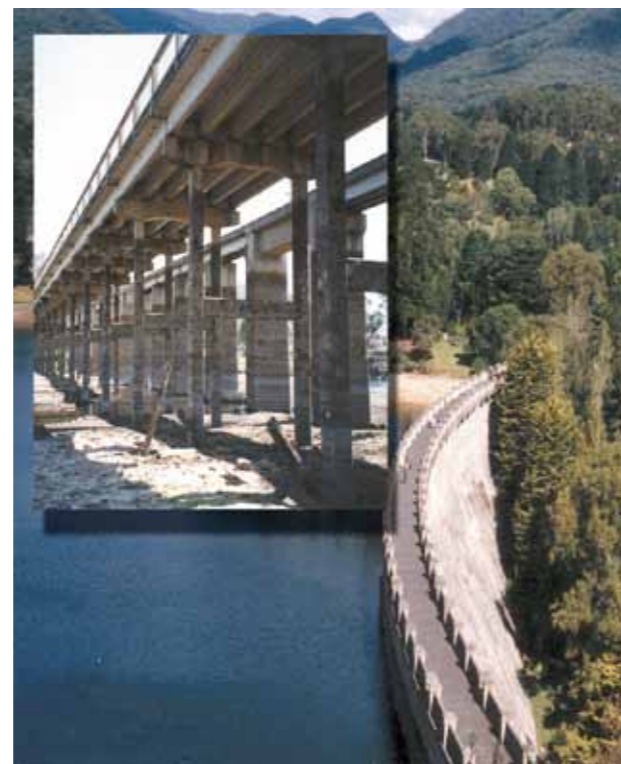
- prevention of AAR in planned structures
- assessment of existing structures
- prediction of future deterioration
- rehabilitation and maintenance strategies
- testing and selection of concrete materials
- assessment of corrosion inhibitors
- condition assessment of structures
- prediction of future rates of corrosion
- service life prediction.

ARRB currently offers three areas of testing and assessment as well as Level 2 and 3 bridge inspections:

- alkali-aggregate reaction (AAR)
- corrosion of steel in reinforced concrete
- pile integrity testing.

Bridges designed for 100 years are exhibiting concrete cracking due to AAR just eight years after construction. With expert advice on material selection, this problem can be avoided.

AAR can lead to serious deterioration in concrete, including expansion, premature cracking and reduction in the engineering properties of the concrete. The cracking also exposes the interior of the concrete to aggressive agents such as moisture, salt solutions and gases. This can then lead to further deterioration.



This need not be a problem for you any longer. ARRB Group has established Australia's strongest independent team in the field of AAR. Our expert staff can provide you with state-of-the-art advice and solutions to maximise your investment.

### Corrosion of steel in reinforced concrete

Corrosion of concrete reinforcement can threaten the integrity and safety of a concrete structure and lead to:

- spalling
- loss of reinforcing steel
- loss of structural integrity
- reduced service life.

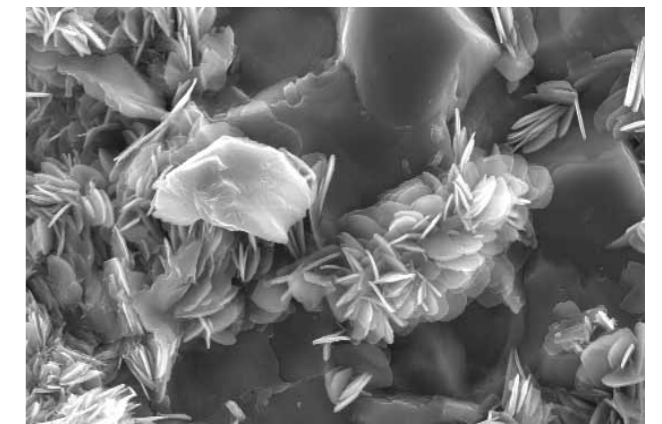
Corrosion of reinforcement steel can threaten their integrity and safety and is a wide-spread problem in coastal regions. In Australia the annual repair bill for bridges suffering from corrosion is tens of millions of dollars.

Corrosion of reinforcement can be caused by carbonation of cover concrete and chloride ion ingress. Inadequate quality of cover concrete or aggressive surroundings can accelerate deterioration. ARRB can provide advice on prevention of corrosion problems for new structures as well as assessment of existing structures.

### Pile integrity testing

Structures such as jetties and port facilities include elements which are not accessible for visual inspection, such as submerged or driven piles.

ARRB has recently acquired, portable pile integrity testing technology for the assessment of these elements. Velocity outputs are converted to a cross sectional area presentation where defects along a pile can be illustrated and the severity of any defect assessed. Low-strain stress waves are generated in the pile by impact which travel down the pile and are reflected back to the pile head.



### Other ARRB Group Concrete Services

- concrete property testing
- chemical reactions in concrete including AAR and delayed ettringite formation (DEF)
- non-destructive testing and evaluation of concrete.

Our laboratories have NATA accreditation for various standard tests.