

Electrochemical Chloride Extraction: Re-injecting Sustainability Into The Australian Market

Troy Palmer¹

Henrique Sica Goncalves¹ and Blane McGuinness¹

¹ Marine & Civil Maintenance Pty Ltd

The presence and ingress of chlorides, particularly when exposed to aggressive wet/dry cycles of tropical and marine environments, is one of the main factors responsible for the deterioration of steel reinforced concrete structures. Electrochemical Chloride Extraction (ECE) is one of the resources available that can interrupt the initiation and/or progression of corrosion in this scenario through an electrochemical process which draws chloride ions already present in the concrete away from the reinforcing steel towards a temporarily surface-mounted anode.

This process not only interrupts chloride-induced corrosion of steel by extracting chlorides, but it also alters the concrete properties in the concrete cover and at the steel surface, including a measurable increase to the pH, and subsequently supporting the (re)formation of a protective passive layer on the steel.

ECE is widely used in North America and Europe, however it has seen minimal use in Australia despite the substantial number of reinforced structures within the extensive coastal area that could benefit from the technology. This paper provides Australian-based research and case studies to demonstrate the emergence of ECE as a sustainable option for asset management and life extension for concrete structures in Australia.