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SOUTH AFRICAN BUILDER®

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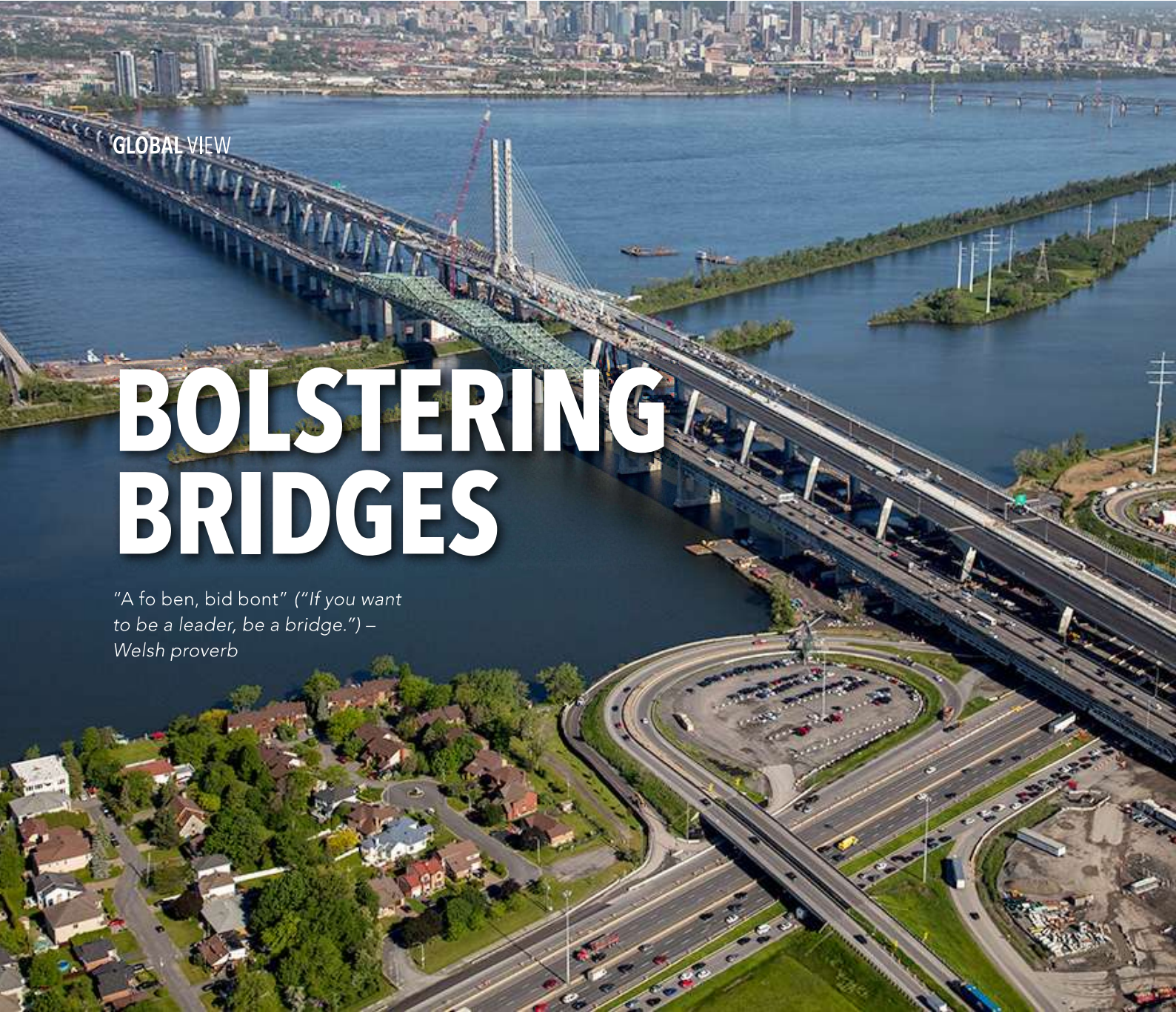
CELEBRATING 101 years

LAYING FOUNDATIONS OF THE FUTURE

MASTER BUILDERS SOUTH AFRICA



BOLSTERING BRIDGES

"A fo ben, bid bont" *("If you want to be a leader, be a bridge.") – Welsh proverb*

Bridges play a critical role in contemporary society, connecting geographic regions, boosting economic trade and enhancing quality of life. Yet these major infrastructure investments face a never-ending battle against ageing. According to the American Society of Civil Engineers' Report Card for America's Infrastructure, the average age of US bridges is 47 years, with many nearing the end of the 50-year service life they were designed to have.

Fortunately, the majority are still in fair or good condition, but the race is on to build and preserve bridges that will keep pace with increasing societal demands for 75- or 125-year service life goals around the world.

One major threat to bridge longevity is corrosion of metals in concrete, which is why several major bridges have recently adopted Cortec® MCI® (Migrating Corrosion Inhibitors) for protection. Here is a look at four of those projects from the past decade.

QUINTE SKYWAY BRIDGE (COMPLETED 2024)

The Quinte Skyway Bridge in Ontario, Canada, was originally built in 1967. At the age of 50+ years, it needed serious repair. Accordingly, the bridge deck was replaced and the bridge supports were repaired or reconstructed. As part of the repair, MCI®-2018 was applied to the piers and underside of the bridge deck. This surface-applied corrosion inhibitor (SACI) combines MCI®

with a 100% silane water repellent for dual protection. The water repellent reduces the ingress of moisture and chlorides, and the MCI® migrates through the pore structure to form a protective molecular layer on the rebar surface to inhibit corrosion even in the presence of moisture or chlorides, thus slowing the process of deterioration.

PELJEŠAC BRIDGE (COMPLETED 2022)

The Pelješac Bridge is a completely new bridge connecting two parts of Croatia. The bridge crosses a finger of the Adriatic Sea, placing this reinforced concrete structure in an extremely corrosive environment. With a design life aimed at 130 years of service, a multi-faceted anti-corrosion strategy was adopted. In addition to thick concrete cover, stainless steel reinforcement, AC coatings and cathodic protection, MCI®-2018 was applied to the entire substructure, including pilings rising out of the seawater. The presence of MCI®-2018 will provide both water repellency and corrosion inhibition to slow deterioration on this substructure.

SAMUEL DE CHAMPLAIN BRIDGE (COMPLETED 2019)

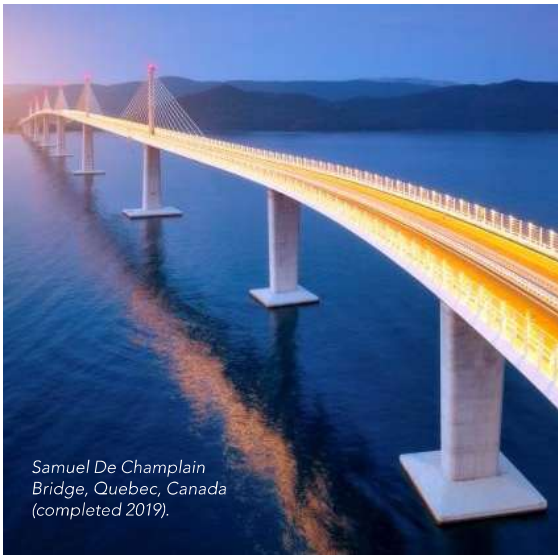
Another new bridge in Canada (Quebec) was designed for a 125-year service life. Built over several years in a winter climate, this 3,4km post-tension (PT) bridge faced grouting delays and required a corrosion inhibitor to protect PT strands already placed in ducts. The PT team used MCI®-309 and was very happy with this Migrating Corrosion Inhibitor™, which could easily be fogged into the ducts and did not require flushing before grouting.

ST CROIX RIVER CROSSING (COMPLETED 2017)

Not far from where MCI®-309 is manufactured at Cortec® headquarters in Minnesota, a completely new bridge was constructed across the St Croix National Scenic Riverway. Much discussion about the impact of a new landmark in this protected river valley led to the construction of a specially designed extradosed bridge (combination box girder and cable stay bridge) to minimise environmental and visual impact. PT cables were used to join 1 000 pre-cast segments and strengthen five pier cross-beams. Inevitably, the cold Midwestern winters created PT grouting delays for this multi-year project. To meet requirements for the application of a corrosion inhibitor, the construction team fogged MCI®-309 into PT ducts where cables had been placed but not grouted, providing ease of protection until warmer temperatures allowed grouting.

EXTENDING BRIDGE SERVICE LIFE WITH MCI®

Bridges will continue to be built, rebuilt and maintained. The important thing is that they do not fail. That is why MCI® technology, including the options mentioned above, can be such an important tool for extending service life by slowing the progress of corrosion. ■



Samuel De Champlain Bridge, Quebec, Canada (completed 2019).