

# SOUTH AFRICAN BUILDER®

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INNOVATION  
IN ROSEBANK



MASTER BUILDERS  
SOUTH AFRICA

## INNOVATION

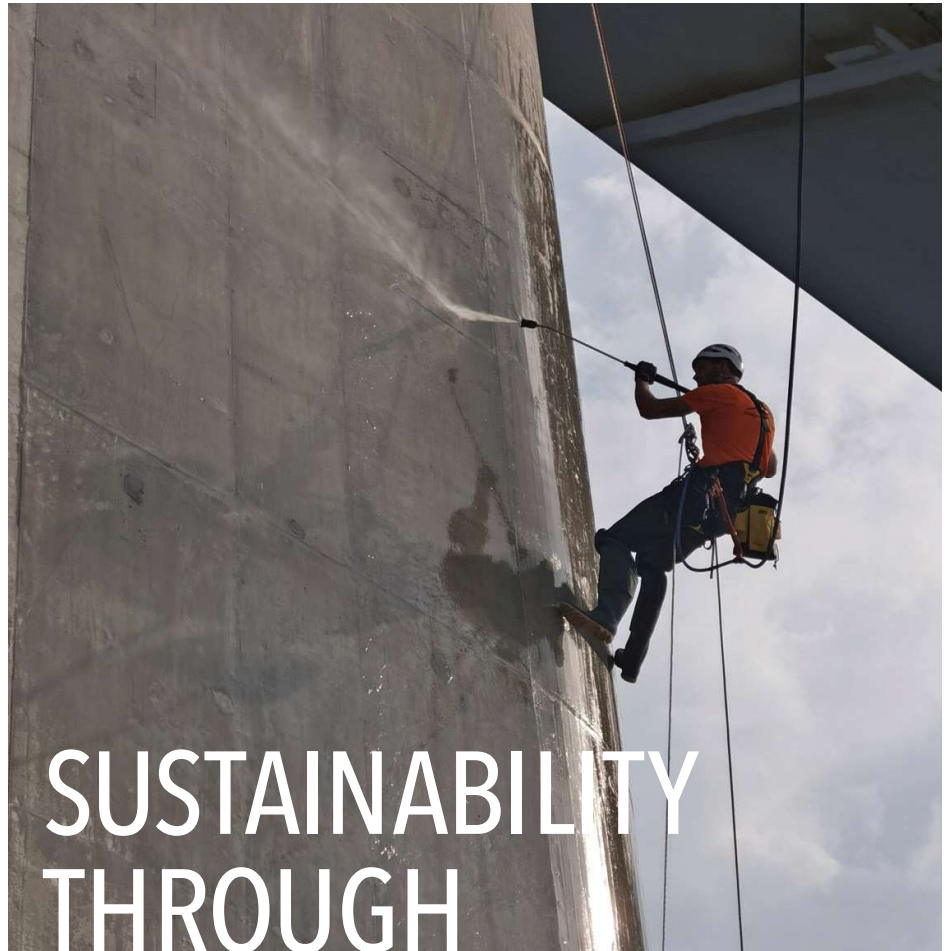
Concrete is the world's most widely used construction material – and also one of its greatest contributors to greenhouse gas. The root cause is cement production, which alone accounts for approximately 8% of global CO<sub>2</sub> emissions. At this rate, successful strategies to lower concrete carbon output are especially significant. MCI® Technology is a simple, but powerful strategy that helps the construction industry take a pivotal step towards a smaller carbon footprint.

Ashraf Hasania, Cortec's MCI® technical sales and product manager, who holds degrees in civil and environmental engineering, explains the common-sense logic: "Increasing the service life of concrete structures using durable materials can reduce the need for demolishing old structures and building new ones. It can also lead to less need for major repairs. This lowers the carbon footprint of concrete structures and promotes sustainable practices."

### **RUST, REBARS AND CRACKING**

The way MCI® helps concrete structures last longer is by attacking one of the biggest enemies of concrete durability: corrosion of metal reinforcement. As rebar rusts due to carbonation, chloride exposure and other environmental conditions, it expands and puts pressure on the concrete cover. This leads to cracking,

*(Right, from top): This modern home is equal concrete and wood – a simple way of weaning SA off its concrete dependence and structural repairs using admixtures specified for highly volatile environments free up hefty replacement budgets, while reducing the intrinsic CO<sub>2</sub> carbon footprint.*



# SUSTAINABILITY THROUGH EXTENDING ADMIXTURES



spalling and a vicious cycle of further exposure to corrosives and additional damage. Based on salts of amine carboxylates, MCI® Technology interrupts this process by migrating through the concrete pores to form a protective molecular layer on the rebar surface to delay and reduce corrosion. Service life models and lab and field studies have shown that MCI® can increase service life by three to four times. This translates into a comparable reduction in concrete’s carbon footprint.

**TREAT NOW, TREAT LATER, BUT ALWAYS TREAT**

MCI® can be used at any stage of a structure’s life-cycle, but the best course to pursue is early treatment. “Sustainability in construction starts early in the process,” advises Hasania, “specifically in the design phase with careful selection of construction materials and concrete mixes.” Ideally, this includes the choice of MCI® concrete admixtures, which can be added to new concrete at the ready-mix plant or construction site. In contrast to calcium nitrite admixtures, MCI® admixtures have a low dose independent of chloride loading and do not negatively affect concrete mix properties. Existing structures can be treated with MCI® in the form of surface-applied corrosion inhibitors (with or without water repellent) and repair mortars.

Once applied, the MCI® molecules migrate through concrete pores to protect embedded rebar in sound concrete, or to even out corrosion potential and interrupt the problematic ring-anode/halo



**“INCREASING THE SERVICE LIFE OF CONCRETE STRUCTURES USING DURABLE MATERIALS CAN REDUCE THE NEED FOR DEMOLISHING OLD STRUCTURES AND BUILDING NEW ONES.”**

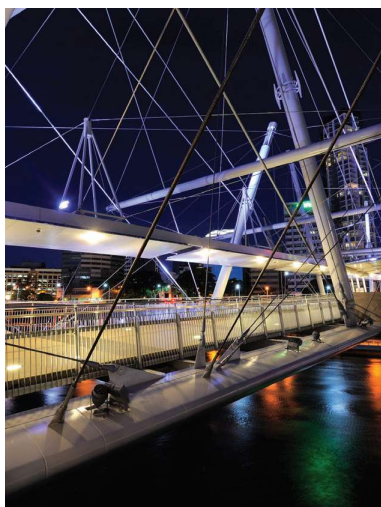
effect between new patch repairs and old concrete.

**RENEWABLE AND SAFE**

In addition to the main goal of helping concrete structures last longer, MCI® Technology offers other attractive features. For example, MCI®-2005 is a USDA-

*(Above): Bio-based admixtures can mean carbon-positive results, with self-healing properties.*

certified bio-based product that contains 67% USDA-certified bio-based content. This use of renewable resources can help the project earn credits towards LEED certification, while adding a more sustainable image to the structure and builder. Another attractive feature is the low toxicity of MCI® products, many of which are certified to meet NSF Standard 61 for use in potable water structures.



*(Above): The use of innovative admixtures in the construction phase can reduce the concrete load for lightweight structural requirements.*

Considering the costs of construction and rebuilding alone, the benefits of extending concrete service life are clear. Add to this the ripple effect of decreasing the amount of new cement needed to repair and replace old structures, and the advantages of MCI® Technology go even further – helping the construction industry take major steps towards a smaller carbon footprint and a more sustainable future. ■