

# STORIES OF STRENGTH

## Railcar Facility

North Augusta, SC



### We're going to need a tougher slab.

In North Augusta, South Carolina, thousands of tons of railroad cars and steel components are shipped to and from a major rail maintenance facility every week, wreaking havoc on the hardstand concrete slabs that cover the yard. The punishment from rolling loads, impact loads and abrasive wear is so extreme that the facility has maintained a quarterly rip-and-replace program to deal with the persistent failure of their slabs for more than 20 years.

**Proposed ultra-high strength design** In an effort to extend the service life of the concrete and reduce replacement projects, an alternative design was proposed which increased the overall thickness of the slab, sub-base preparation and corresponding excavation, and required steel reinforcement; of most significance, this increased cost.

**Maybe there's a better way?** Enter Mr. Brett Cooper, owner and VP of Construction Perfected, Inc. (CPI). He heard about the impressive results **EdenCrete**® had achieved with Augusta Ready Mix at the GDOT trial [see Stories of Strength - Georgia Highways]. He reached out to Augusta Ready Mix for a consultation about the project. After careful study, the team ascertained that CPI could achieve the durability, quality and longevity the railcar facility desired by using the **EdenCrete**® carbon concrete additive—without much else.

**The Test** Using the same formulation as the GDOT trial [minus the accelerator], CPI poured a 7.6m<sup>3</sup> slab enriched with **EdenCrete**®, and a second “control” slab without **EdenCrete**®. Six months later, the **EdenCrete**® slab looked great and had not cracked. However, the “control” slab showed major cracking.

≈ **\$1.40** /m<sup>2</sup>

Slab Life [≈1yr]

#### 215mm concrete slab

w/ welded wire mesh  
at mid depth or  
macro-fibres dosed  
at 2.7kg/m<sup>3</sup>

150mm Graded Aggregate Base  
(95% compaction)

**Engineering Design for last 25 years**  
380mm Excavation

≈ **\$1.10** /m<sup>2</sup>

Slab Life [≥5yr]

*Including the  
cost of EdenCrete®*

150mm concrete slab  
w/ EdenCrete®

EdenCrete® dosed at equivalent to  
10L/m<sup>3</sup> EdenCrete®

**New Innovative Design w/ EdenCrete®**  
150mm Excavation

**The Results** The new results with **EdenCrete**® were so promising that CPI and the facility's owner decided to move forward with the **EdenCrete**® solution. The **EdenCrete**® solution is expected to at least double the concrete life, yet require much less concrete, no steel reinforcing and greatly reduce excavation time. Consequently, the budgeted repair costs, with **EdenCrete**®, are 20% less than the earlier proposed ultra-high strength concrete design.

## Areas of significant improvement for this application



ABRASION



FLEXURAL



SHRINKAGE



PERMEABILITY



TENSILE



COMPRESSIVE



STAINING

EdenCrete® enhances concrete in all seven areas, but was specifically selected for abrasion, flexural, permeability, tensile, and compressive strength for this project.



1



2



3

EdenCrete® test slab [1] shows no signs of cracking or wear, while the control slab [2] without EdenCrete® is showing cracking already. 3. Example of heavy Railcar axles and other parts that are constantly impacting the concrete slabs.

*“We couldn’t be more pleased with this. It’s not every day you get to reduce the cost of a project for a client almost 50% and still deliver to them the quality and reassurance they’re asking for in the service-life of the concrete. **EdenCrete®** is a great concrete additive and we are excited to have discovered its existence. This technology could be a game changer for the concrete industry,” said Brett Cooper, [Owner and V.P. of CPI].*

### Harness the strength of carbon nanotubes for your next pour.

Developed by EdenCrete Industries Inc., **EdenCrete®** is a carbon nanotube-enriched liquid additive that elevates concrete structures to new levels of strength and toughness. When added to concrete mixtures, it performs like multiple additives rolled into one. It boosts surface abrasion resistance and produces extremely low permeability while improving strength properties [i.e., compressive, flexural, and tensile] like no other product on the market today.



Associations



AU 1300 737 787 [edencrete.com.au](http://edencrete.com.au) Parchem Construction Supplies Pty Ltd 1956 Dandenong Rd, Clayton VIC 3168  
 NZ 0800 657 156 [concreteplus.co.nz](http://concreteplus.co.nz) Concrete Plus Ltd 23 Watts Road, Sockburn NZ 8042

**EdenCrete®**

Eden Innovations LLC is a wholly owned subsidiary of Eden Innovations LTD, Perth, Australia. Edencrete, the Edencrete logo and Edencrete Pz are registered trade marks of Edencrete, used under license.