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### Case Study: Soccer City Stadium, Johannesburg, South Africa



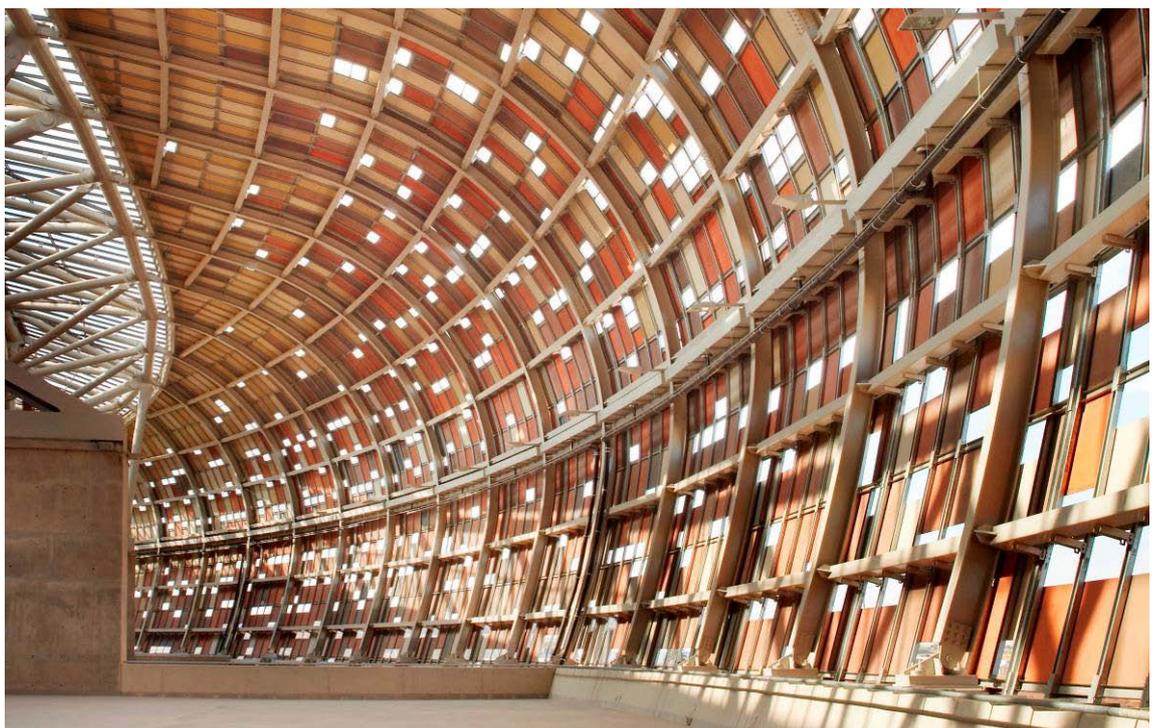
#### Fiber-Reinforced Concrete Cladding Supports Soccer City Stadium's Construction by Efficient use of Resources and Extending Building Life.

The stadium first opened in 1989, and was redesigned for the 2010 World Cup Finals. The project features fibreC® concrete panels from Rieder Smart Elements, reinforced with Cem-FIL™ AR fibers, which reduce the weight and thickness of the concrete by up to 10 times compared to conventional precast concrete panels. They are 100 percent recyclable, enhance building life and durability, and are resistant to corrosion, fire, UV light and temperature variations.

#### PROJECT REQUIREMENTS

The redesigned appearance of Soccer City Stadium was created by Boogertman Urban Edge & Partners. Perhaps their biggest challenge was finding way to execute the unusual design requiring curved panels and a checkerboard of colours and textures that echo the appearance of the calabash gourd.

Added to those challenges was a need to help the stadium achieve its sustainability goals – using building materials that minimise resource use, are recyclable, and extend the life of the structure.



fibreC® panels were assembled into modules on-site, then mounted onto the steel frame.



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A calabash gourd in African society has many uses. It is used to clean rice in West Africa, carry water in sub-Saharan Africa, and as a food container in most parts of the continent. In Southern Africa its most common use is as a serving or storage vessel for water or home-brewed beer.

### SOLUTION

The architect addressed all of those issues by cladding the stadium with custom-coloured fibreC® panels from Rieder Smart Elements. The panels were manufactured at Rieder's factory in Germany, and shipped to site in containers. The production of fibreC® panels causes 40% less global warming potential than typical fibre cement panels or aluminium sheet.

The shell of the stadium was divided into a roof section of transparent polycarbonate elements and the façade section based on GRC. The fibreC® panels are 1.2 x 1.8m, with a thickness of only 13mm. In total more than 2100 modules, each containing 16 panels, were pre-assembled in an on-site factory.

The fibreC® panels in eight colours are suspended on a substructure of more than 100,000 specially designed steel elements by Valenta metallbau. While the structure supporting the panels is substantial, it weighs and costs less than supporting elements required for other types of panels.

### PROJECT INFORMATION

The three-tiered stadium is 60m tall, and 300m in length, and can accommodate 90,000 spectators, making it the largest stadium on the African continent, and was category winner in the World Architecture Festival 2010.

Contributors	Architect	Boogertman Urban Edge & Ptnrs
	Consultant	PD Naidoo & Associates
	GRC Producer	Reider Smart Elements GMBH
	Project Owner	City of Johannesburg
Project	Location	Johannesburg, South Africa
	GRC Type	fibreC® concrete panels
	GRC Volume	30,000m <sup>2</sup>
	GRC Finish	Pigmented + sandblast / brushed
	Mould Type	Conveyor
	Completion Date	October 2009
Materials	AR Glass Fiber	Cem-FIL™ 54 Roving

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