

# Concrete Indispensable for S.A Post-Pandemic Revival

*With adequate infrastructural provision high on the national priority list as the pandemic subsides, concrete will be the one indispensable component for almost all municipal or national government rebuilding and development projects, says Bryan Perrie, CEO of Cement and Concrete SA (CCSA).*

Here Perrie outlines some of the vital elements concrete can provide for infrastructural projects:

After water, concrete is the most used resource globally and contributes significantly to South Africa's standard of living. It is used for many infrastructural projects, ranging from houses, hospitals, schools and universities, offices, water reticulation and sewers, community dams and reservoirs, and road and highway networks.

It will also be an essential part of any future "super city" in SA.

Concrete is one of the most durable and cost-effective materials on earth. This extended life span results in the lower expenditure of energy in building new homes and infrastructure and substantially reduced maintenance and impact on finite resources. In the long-term, concrete's durability, low maintenance, and reusability have substantial positive economic effects. Concrete structures have optimal energy performance with an associated positive impact on whole-life energy usage.

Up to 40% of all materials used in the human activity are directed into the built environment. This has a direct and visible impact on the world's finite resources. In practice, many of the factors affecting the contribution of concrete to sustainable development are interrelated. For example:

The use of cement extenders in the concrete mix has a positive environmental impact because it reduces the amount of cement needed in the mix, and less production of cement means lower



**Above:**  
**Proof of permanence**  
**The Pantheon in Rome has a coffered dome which, almost 1 900 years after it was built, remains the world's largest unreinforced concrete dome.**

CO2 emissions; and  
Concrete also uses other industry secondary products, resulting in waste minimization and savings in landfill space.

To achieve maximum sustainability benefits during a building or structure's life cycle, the designer, specifier, and owner must consider many factors during the design, construction, usage, and end-of-life phases. This applies to saving energy, reducing finite resources, and entirely using the other inherent advantages of concrete.

Some of these advantages and attributes of concrete are:

## **Local Material**

All the primary materials used in concrete (except for some sophisticated imported admixtures), are produced locally. Extenders and slag aggregates used in concrete mixes are secondary products that would otherwise have been dumped if not used by the cement and concrete industry. While the cement factories are generally located close to their raw material sources, sources of aggregates and ready-mix plants can be placed close to the areas of demand to reduce the energy required for transport.

### Labor Intensive Construction

With unemployment at unprecedented levels, concrete and concrete products in most cases lend themselves to labor-intensive construction, whether for small-scale manufacture of concrete products or the use of concrete in various forms of construction. In the provision of human settlements, all the concrete roof tiles, concrete bricks or blocks, concrete curbs, concrete reticulation poles, concrete block paving, and concrete pipes that may be used can be installed using labor-intensive construction methods.

### Design Flexibility

As concrete products and elements can be constructed into any shape and be cast in various ways, designers are given an enormous amount of flexibility. The fact that concrete can be built in-situ or by precasting - or using a hybrid of the two methods - provides the designer with the exceptional creative scope when planning a project, particularly if the project needs to be fast-tracked.

### Variety of Finishes

There are unlimited possibilities when using concrete for finishes that can be designed in various attractive colors and various textures. The finishes are incorporated into the concrete during the construction stage rather than later as a separate operation. The use of concrete as the ultimate finish means no other finishing activities such as painting, tiling, or coating are required, saving energy and materials at the construction stage with lower future maintenance costs.

Furthermore, concrete finishes do not emit any toxic or volatile products into the environment and have no detrimental effects on the community during their entire life cycle.

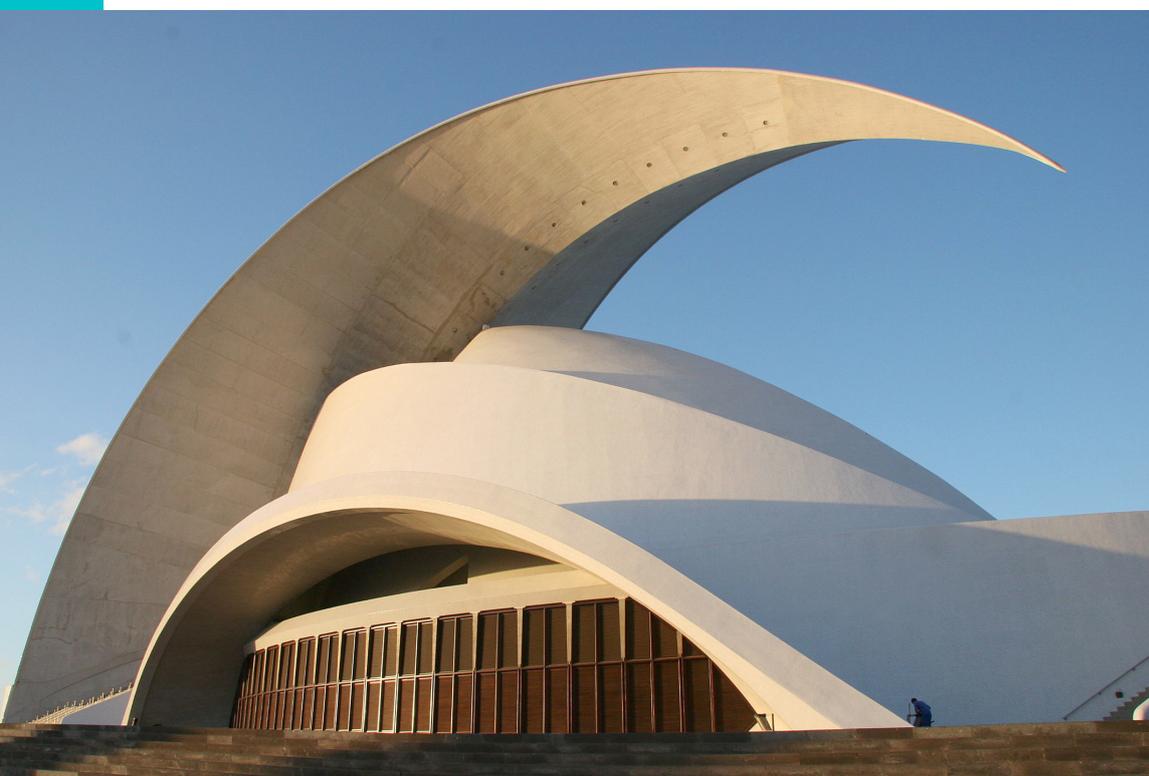
### Life Cycle Cost

Various analyses show that, because of concrete's durability, the whole life cost of many projects is lower when concrete is used as the primary construction material. Then, concrete can easily be recycled and crushed to produce building aggregate at the end of the usage phase. South Africa has not yet fully exploited the recyclability of concrete.

### Structural Integrity

The structural design and construction of concrete elements in buildings (including in-situ reinforced concrete, precast concrete, tilt-up, hybrid construction, and post-tensioned concrete elements) have been fully appreciated and acknowledged by architects, structural engineers, and contractors for many years. Well-constructed concrete can last well over a century. For example, The Pantheon in Rome, built in 126AD, is still in use and has a coffered dome which, almost 1 900 years after it was built, remains the world's largest unreinforced concrete dome.

Concrete offers many other benefits, including - to name just a few - sound insulation, fire resistance, light reflectance, and roads requiring far lower maintenance and pothole repairs that now plague municipalities. Concrete structures also are beautiful and will enhance the aesthetic appeal of any town or city. This age-old material is the cornerstone for providing the infrastructure that can lead South Africa to a sustainable future.



**Left:**  
The Auditorio de Tenerife in the Canary Islands, designed by renowned Spanish architect, Calatrava, spectacularly shows the creative scope concrete offers the designer.