

Company Profile

1. Executive Summary

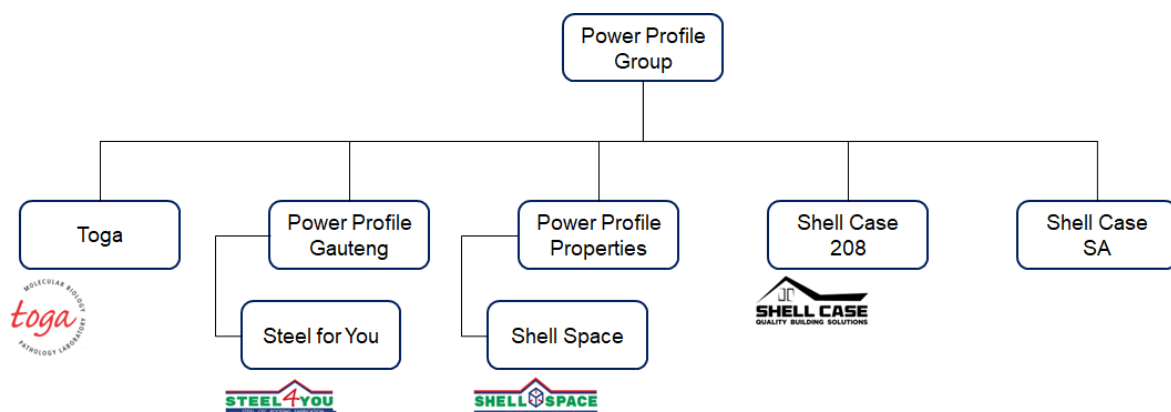
Shell Case is a manufacturing and building construction company that utilises the Power Profile building system (a patented, light-weight alternative building system) to deliver turnkey solutions that are green, energy efficient, durable, of a high quality, and aesthetically pleasing to a variety of sectors. The building system provides strong, insulated structures that have been tested and approved to withstand extreme weather conditions. It is an innovative building concept that is environmentally friendly, cost-effective and quick and easy to install. The concept was developed in 1994 and structures from that time are still in use.

The company strategy is to provide building solutions that meet the need for specific types of building structures.

2. Overview

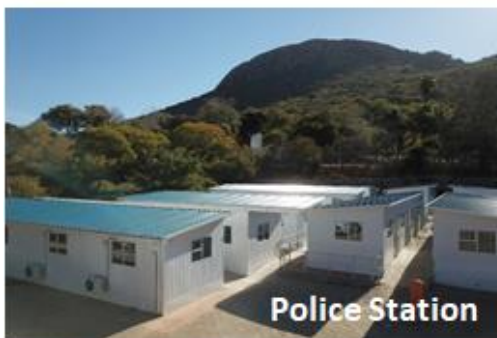
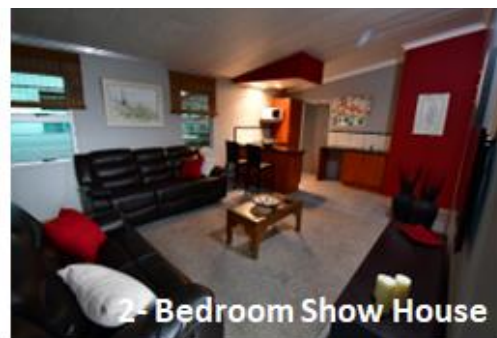
The Company

Shell Case is a majority black-owned level 3 B-BBEE building construction company that uses a patented, light-weight building system to deliver turnkey solutions to the market. The system has been used for building schools, clinics, office facilities, police stations, church buildings and houses/ accommodation in South Africa and neighbouring countries (as well as, on occasion, in the USA) for almost three decades. Shell Case has an active Agrément certificate and is registered at the NHBRC. In addition, the company is registered on the Central Supplier Database, has a level 7 CIDB grading and is CMS accredited.



The Building System

The building system was developed and patented in South Africa in 1994. The basic element of the system is a lightweight, structurally engineered component made up of a 50mm thick expanded polystyrene core of density 16kg/m³ encapsulated by 0.5mm zincalume sheets (continuously hot-dip aluminium/ zinc-coated steel sheet). The zincalume sheets are profiled in such a way as to provide structural strength to the roof and walls, obviating the need for additional structural elements (such as a steel frame) in the case of single storey buildings.





The inherent structural strength of the building components is a key feature, allowing for the ease and speed of building erection. The building components are used for the internal and external walls as well as the roof and can be manufactured in various sizes. Additional insulation and fire stop boards are used as per the Agrément specification.

The standard flooring system is a reinforced concrete floor to which the building panels are attached using purpose-made steel or aluminium floor channels. As an alternative, structures may be mounted on a chassis (steel frame) using a specifically designed floor panel.

The system has been tested and approved by the South African Bureau of Standards (SABS) for its structural integrity and strength. It exceeds the safety standards set for fire and meets the requirements for noise reduction and weather durability. It carries an Agrément certificate and has been successfully tested in Australia and Chile.

The key features of the building system can be summarised as follows:

- *Structural integrity*

The structural integrity of the building system is attested by the Agrément certification in South Africa and storm wind testing undertaken in Australia. The encapsulation of fire-retarded polystyrene at every 405mm ensures the non-combustibility of the building system and guarantees it retains its integrity. When used with a 15mm Fire Stop Board, the system is certified and tested by the CSIR to withstand fire for a minimum period of 30 minutes. The use of the same encapsulated system for roof covering allows for insulated mono and pitched roof possibilities which can be spanned unsupported for up to 4.5m. The inter-connection of the building components adds to the structural integrity of the system with no need for further structural support. The building as a whole provides added shell structure strength.

- *Durability*

The South African Agrément certificate finds the durability of the system to be sound based on the materials used; furthermore, the system has been in use in Southern Africa since 1994 and structures from that time are still in use.



- *Insulation*

The building system provides good insulation and meets the requirements of the South African Agrément certification in terms of thermal performance, rising damp and rainwater penetration; energy efficiency is regarded as satisfactory (with external walls assessed as having a total R-value of 2.28m²K/W); sound attenuation criteria for Agrément certification has been met with in situ airborne sound insulation between adjacent rooms likely to be 47dB.

- *Cost-effectiveness*

The Shell Case building system provides a quality offering at an affordable price, i.e. typically two-thirds the cost of a conventional building, due to lower cost of materials and labour. Furthermore, by producing in large quantities the basic product cost could be reduced by up to 50% through standardisation and economies of scale. This represents a significant advantage in the building industry.

- *Sustainability*

The sustainability implications of the Shell Case building system include the following –

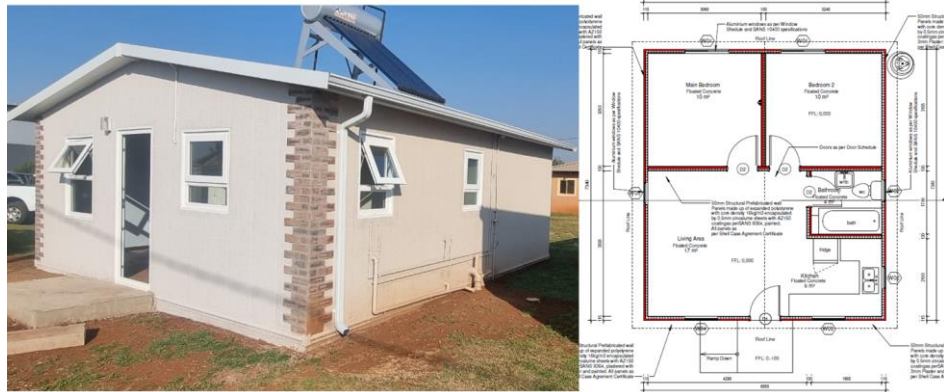
- Building structure features, i.e. good insulation properties and easily ventilated
- Logistics, i.e. a lightweight product that is easily handled and transported and represents a high volumetric utilisation during shipping
- Construction site, i.e. limited site works and fast construction has low site impact and minimal rubble removal.

Shell Case recently participated in a project with the University of Cape Town and the NHBRC to evaluate various ABTs to develop and build a ‘net-zero’ house. A net-zero house is defined as a house that combines energy efficiency and renewable energy generation to consume only as much energy as can be produced onsite through renewable resources over a year. The purpose of the project was to:

- Examine the sustainability impacts of various building materials, methods and IBTs leading to the affordable net-zero energy house during the life cycle of buildings
- Provide data-driven knowledge on how affordable houses' construction activities and operation may contribute to their life cycle sustainability and, consequently, assist in achieving affordable net-zero energy houses
- Design and construct net-zero energy house using most optimal IBT system.

The outcome of the project was that the Shell Case system not only provides a more economical environment and technical advantages for developing affordable net-zero energy houses compared to hybrid systems but also has the best energy performance (54.03% energy saving compared to conventional houses) due to better thermal insulation. Moreover, the system significantly reduces the embodied energy of the house (48.85%). Using only a 3kWh solar energy system the house was converted to a net-zero energy house.





- *Modern design and variety of applications*

In the past Shell Case has focused its efforts on establishing its system as the go-to alternative building system in the South African market. The emphasis has been on the features of the building system and its ability to meet the needs of conventional building design. The broad application and durability of structures delivered in the public sector since 1994 bear witness to achieving this goal.

The company has recently recognised, however, the need to shift its focus from marketing and establishing a building system to providing solutions to meet the need for specific types of building structures. In other words, Shell Case wants to leverage the unique features and capabilities of its building system to meet the demand for a variety of building structural requirements. This may include conventional buildings but also provides the scope to exploit the capabilities of the building system for more progressive designs and to meet unique requirements. The MyCube unit is an example of an appealing, alternative, modern design suitable for a variety of uses. MyCube is an example of an alternative building design. It is a multi-purpose, one-room, single storey structure that utilises the structural capabilities of the building system. The structure has a unique, modern, angled design, making full use of the structural integrity and flexibility of design provided by the Shell Case system. It can also be developed into a double-storey structure.





3. Conclusion

The Shell Case building system is modular and flexible and the structural strength of its components (as well as the added shell strength) lends itself to a variety of applications. It provides for high-quality, durable structures that meet building standards. It also allows for flexibility of design, cost-effectiveness, ease of handling and speed of construction.

The Shell Case strategy is to exploit the building system's capabilities to meet market demand for conventional buildings as well as allowing for the unique requirements of non-conventional building structures.

