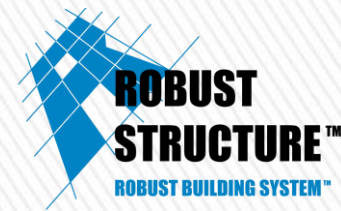




THE ROBUST BUILDING SYSTEM



The System Core



Unique Factory-produced W-profiled Core panels

- Manufactured from mild steel coils
- Panels are 430mm wide
- Lengths are determined by the heights of walls



Wall Structure

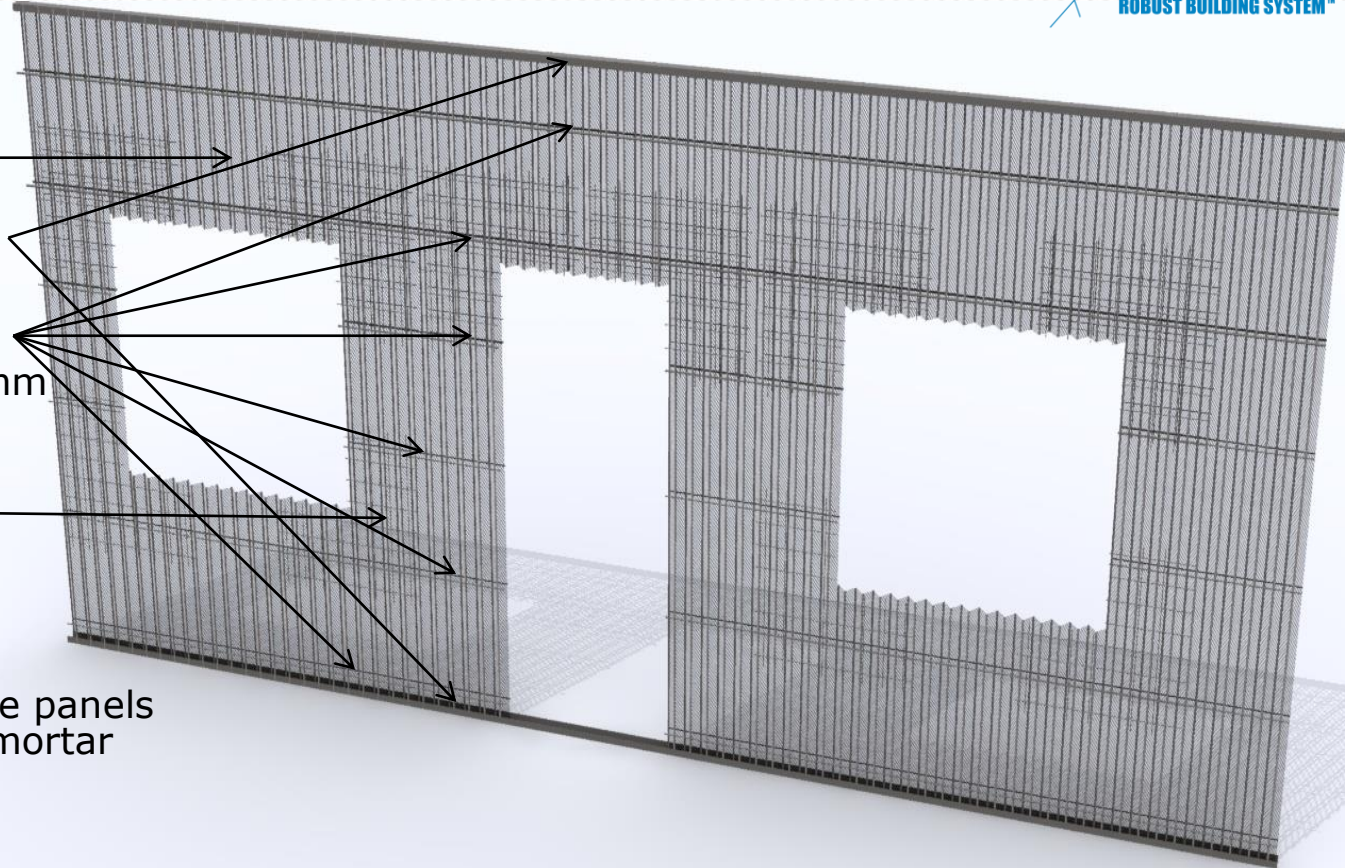
Factory-produced W
profiled expanded metal
Core panels

Top and Bottom C-Tracks

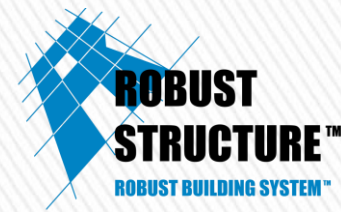
Horizontally spaced steel
reinforcing Y-Bars 6&10mm

Pre-welded steel mesh
Ref 156

Mortar is applied to the panels
mechanically using a mortar
pump



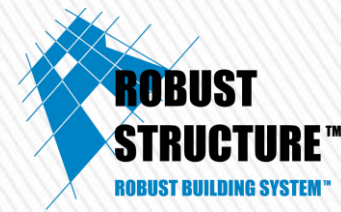
Distinctive Benefits



1. STRONGER
2. MONOLITHIC
3. FASTER
4. EASIER
5. VERSATILE
6. AFFORDABLE
7. ACCREDITED
8. ADDED LIVING SPACE
9. EXCEPTIONAL PERFORMANCE
10. STRUCTURAL WALL
11. PERMANENT FORMWORK
12. COST EFFECTIVE TRANSPORT



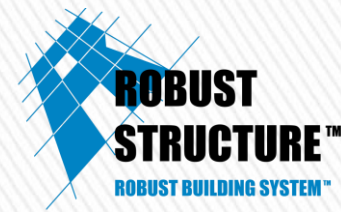
The strength of a Robust wall is superior to that of conventional walling systems:



- It is equivalent to a steel reinforced walling structure.
- The mortar mix design can be adjusted to suit the structural Mpa strength as required by the engineer.
- Highly resistant against structural cracks caused by ground movements as well as forces of nature such as earthquakes, tornados and hurricanes.
- Has a high load bearing strength of 30 tons/lm on a standard 115mm external wall with a 25Mpa mix application therefor eliminating the need of columns in a double storey structure.
- The lateral strength of the Robust wall is by much stronger than that of a single segment walling structure.



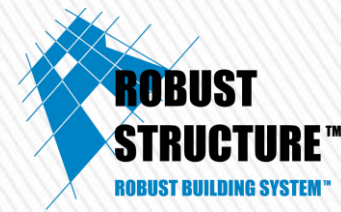
The Robust walls fit together as a single diaphragm structure without any joints and seams that can cause structural interference.



- A wall that is more difficult to break into.
- A structure that has an unlikelihood to ever have any structural cracks.
- Elimination of structural beams and lintels above all openings.
- A Structural ring beam forming part of wall, lending added lateral strength to walls and allowing greater unsupported suspended floor slab spans.



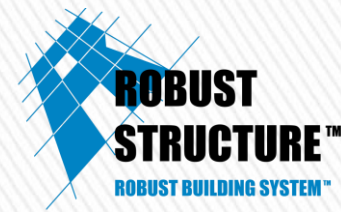
The Robust technology lends itself to be a much faster walling construction method in comparison to that of conventional systems.



- The Robust core panels are light weight and are easily maneuverable around the construction site, helping to speed up the construction process.
- Greater throughput with the same amount of labour with 60% of the work force being unskilled.
- The mortar is mechanically applied eliminating the timeous orthodox application by hand.
- No beam filling required eliminating a tedious conventional time delay.
- No time spent on chasing of services as these services are applied before the mortar application.



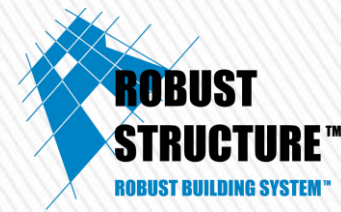
The Robust Core wall panels weigh 3,5kg/m² and provides for a lighter structure with the following benefits:



- Ease of assembly and erection of panels.
- Women and the youth can be employed to work with this lightweight structure as it does not put any physical strains on the labour force.
- Easier transfer of skills to unskilled & unschooled communities within a few days.



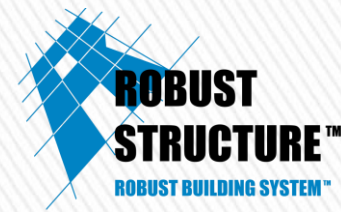
As with other innovative and/or alternative systems, Robust is not limited or restrained to a specific moulding, module or dimension.



- It can be built according to any conventional plan requirements and designs.
- Is utilized into any form and shape for example: Curved walls, arched openings and any shape of columns.
- Not limited to only building houses, but can be implemented to building any walling structure both above and below ground.
- Can be extended and altered to existing conventional brick or block buildings.
- Used as permanent shuttering for applications such as columns, retaining walls and reservoirs eliminating expensive hiring costs.



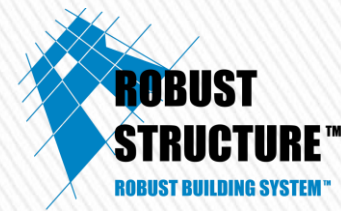
Compared to other innovative and conventional systems, Robust's durability is superior whilst being affordable:



- Robust building costs are comparable to conventional building systems.
- Due to the speed in the delivery of units, property developers, government and the community are all winners.
- Due to its speed of construction there is a reduction in finance costs and overheads.
- Much less rubble to be removed.



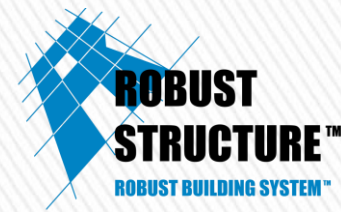
The Robust Building system has been accredited and approved by:



- Agrément South Africa (Certified in 1999)
- SABS (South African Bureau of Standards)
- NHBRC (National Home Builders Registration Council)
- Miami Dade County, USA



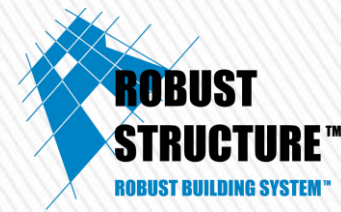
Due to the thickness of the Robust walls additional internal living space is created.



- Robust external walls are 115mm thick(inland) and 130mm if built within 15km of the coast. Internal walls are 90mm thick.
- This compares favourably with plastered brick walls of 260mm externally and 150mm internally.
- In a 40m² BNG Type dwelling, an additional internal area of 4-5m² is added to the home. This is equivalent to that of an 45m² dwelling built the conventional way.



Exceptional above average Aspects of Performance:



- **Durability:**
More durable

- **Acoustic performance:**
50db airborne sound

- **Fire performance:**
Classified Type FR (non-combustible) Fire resistance 60 minutes. 4 Hours Structural Resistance.

- **Thermal performance:**
Similar to brick.

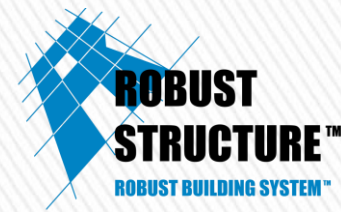
- **Energy Usage:**
Better than brick

- **Water penetration:**
Better than brick

- **Condensation:**
Similar to brick in non-coastal areas but better than brick in coastal regions specifically IN Southern Coastal Problematic Area) SCCPA



Robust can be applied structurally by merely adjusting the wall thickness and steel and mortar requirements.



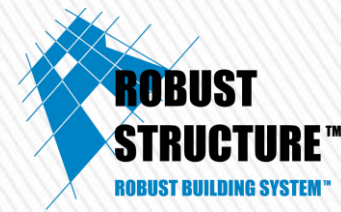
- Depending on the load or lateral strength requirements, Robust walls can be adjusted to suit the requirements according to engineers' specifications.
- Engineers calculations to determine strength specifications will be as per the conventional code of practice.
- Adjustments to the standard Robust wall structure will involve the amount of steel required per m² of wall area and the Mpa rating of the mortar applied. Wall thickness will be adjusted in some cases.

Most common structural implementations utilizing the Robust walling system are:

Load bearing walls, Retaining Walls, Water Retention/Reservoir walls & Structural Columns.



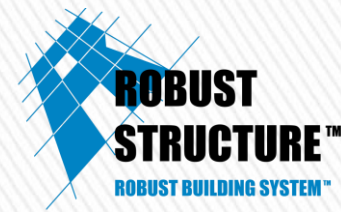
Robust can be applied as permanent shuttering or formwork.



- By making use of the Robust Building System, the core material can be utilized as formwork. This formwork will replace the conventional shuttering methods used to form structures such as columns.
- When using Robust as formwork, waiting periods before removing shutters are eliminated.
- Expensive hiring or purchase costs of shuttering and formwork are reduced dramatically and in most cases eliminated in total.



Effective Transport leads to a huge reduction in Carbon emission and costs.

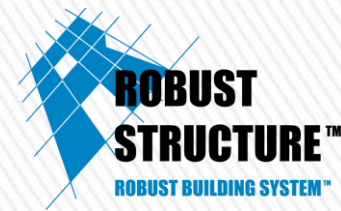


- Highly compacted making transport more cost effective (9,500m² of wall core panels (34tons) fits on a super link truck, equivalent to 86 BNG houses). Bricks required for BNG House = 9900 Bricks. Cement Stocks 22,7 tons = 1,5 BNG Houses. 86 BNG Houses with brick = 58 trucks.
- 1 truck of Robust material is equivalent to 58 trucks to transport convention material reducing transport costs dramatically.
- A 6m sea going container can transport 6000m² of wall core panels.
- Due to the reduction in the amount of transport or trips required there is an indirect reduction in carbon emissions.



MARKET PRESENCE:

Robust has successfully been implemented in the following countries to date:



- Zimbabwe
- Zambia
- Namibia
- Malawi
- Botswana
- Mozambique
- South Africa
- Honduras
- U.S.A.
- Angola



STEPS ON HOW IT WORKS

1



**Preparation of Raft
Foundation**

2



**Casting of Raft
Foundation**

3



Demarcation on Slab

4



**Assembling Wall
Panels**

5



**Erection of wall
panels**

6



**Fitment of door and
window frames**



STEPS ON HOW IT WORKS

7



Fitment of In-wall plumbing services

8



Fitment of In-wall electrical services

9



Ref156 to corners of all openings

10



Mechanically applying mortar to walls

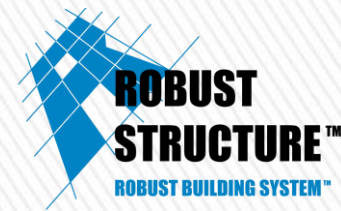
11



Plaster finish to mortared walls



TYPICAL APPLICATIONS:



STANDARD BUILDING APPLICATIONS

Social Housing

Exclusive Housing

Schools

Lodges & Resorts

Multi-Storey Apartments

Office Blocks

Warehouses & Factories

Shopping Centers

Clinics/Hospitals

Community Centers

Correctional facilities (*Prisons*)

Infill walls (*High Rise Buildings*)

ENGINEERED APPLICATIONS

Structural Load Bearing Walls

Structural Load Bearing Columns

Water Reservoirs

Small Farm Water Reservoirs/dams

Sewage Septic Pits/Tanks

Sewage Treatment Plants

Boundary Walls

Retaining Walls

Silos

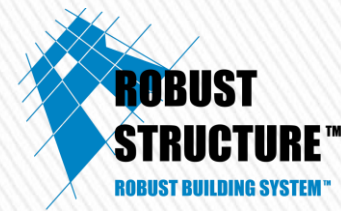
Mining applications

Staircases

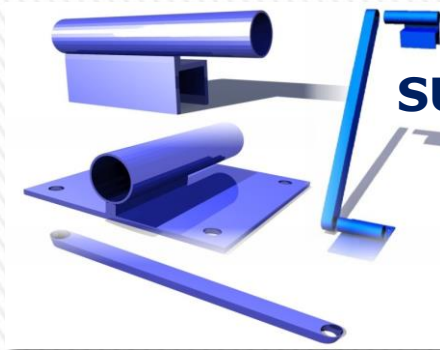
Swimming pools

Suspended Roof Slabs

SPECIALISED EQUIPMENT USED WITH THE ROBUST BUILDING SYSTEM:



MORTAR PUMP



SUPPORT ARMS



BINDING JIG



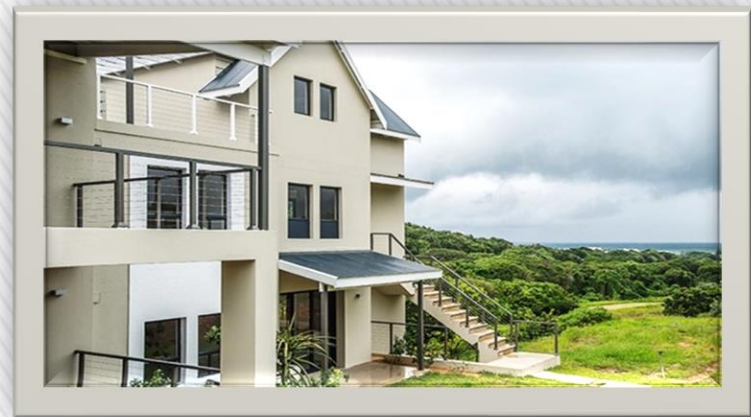
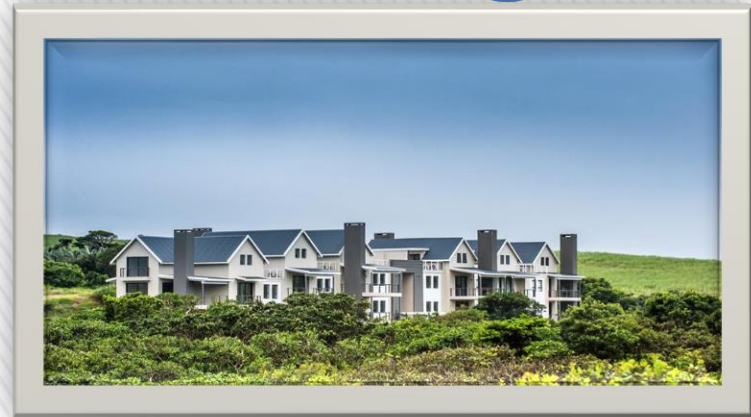
THE ROBUST BUILDING SYSTEM TRACK RECORD



Multi Level Buildings



Multi Level Buildings



Exclusive Housing



Exclusive Housing



Social Housing



Social Housing



Schools



Lodges & Conference Venues



Military Applications



Mine Applications



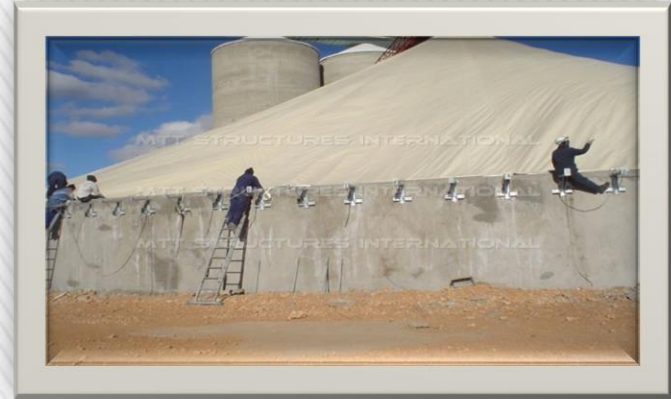
Boundary Walls



Silo's



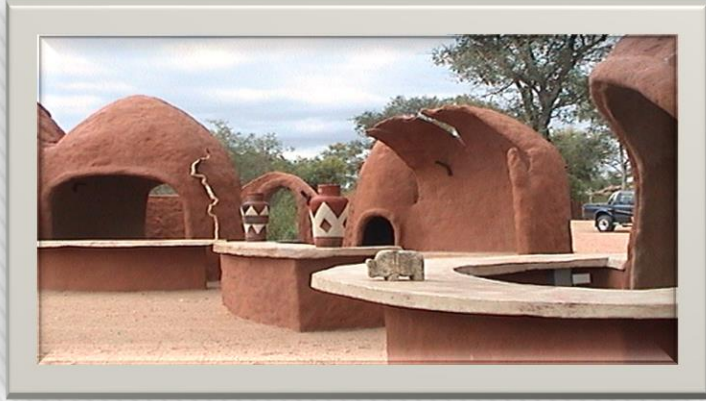
The tent silo has a diameter of 60m and can accommodate up to 20,000 tons of grain, four times the amount of a regular storage unit. The silo is 2m into the ground and 4m above. Utilizing the Robust System saved on shuttering and helps keeping the grain cool. The silo is fed by a central pipe with openings to enable smooth distribution, eliminating the need for the conventional gantry and conveyor belts, thus conserving energy.

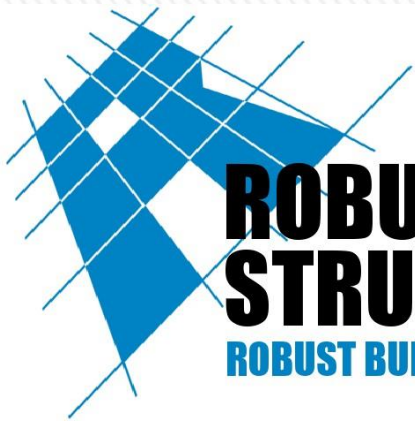
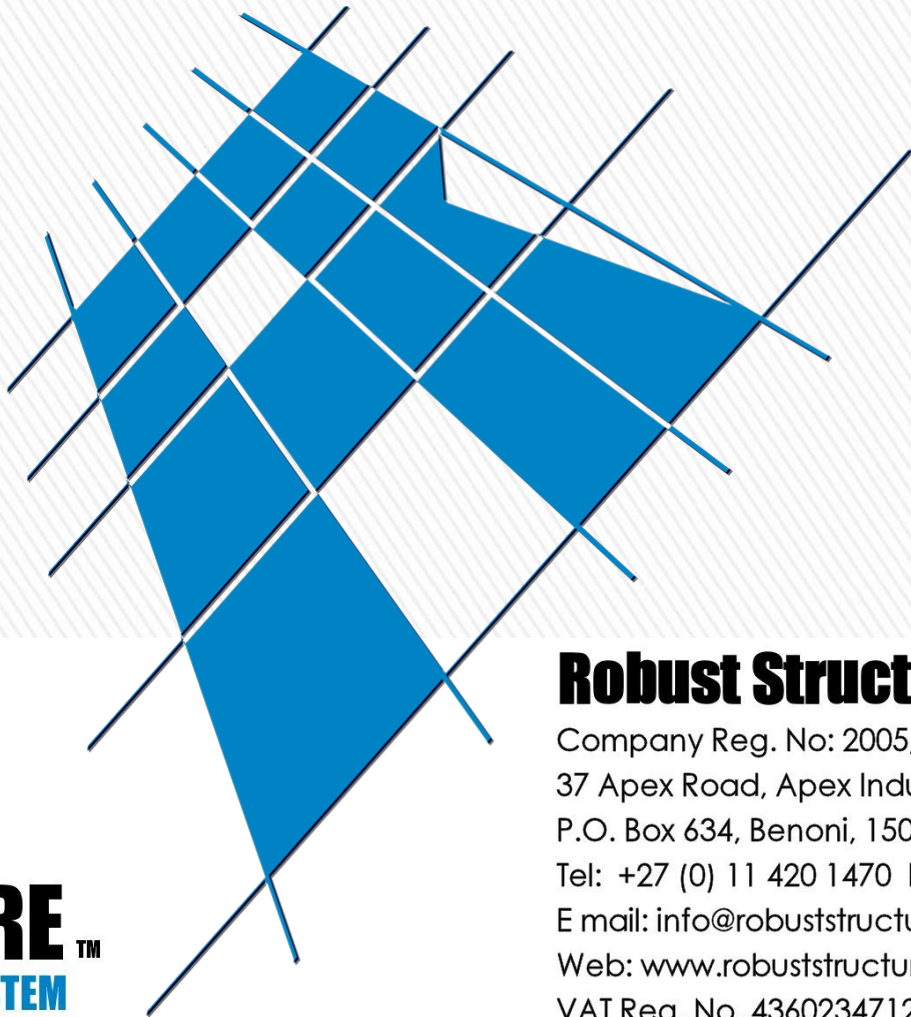


Other Applications



Other Applications





**ROBUST
STRUCTURE™**
ROBUST BUILDING SYSTEM

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