

DRAWING A CLEAR LINE BETWEEN NEW HOUSING DEVELOPMENTS WITH THE USE OF INNOVATIVE BUILDING TECHNOLOGIES AND REMOVAL OF ASBESTOS FROM THE BUILD ENVIRONMENT

PREPARED FOR DEPARTMENT OF ENVIRONMENTAL AFFAIRS



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA



WHO ARE WE

Vision

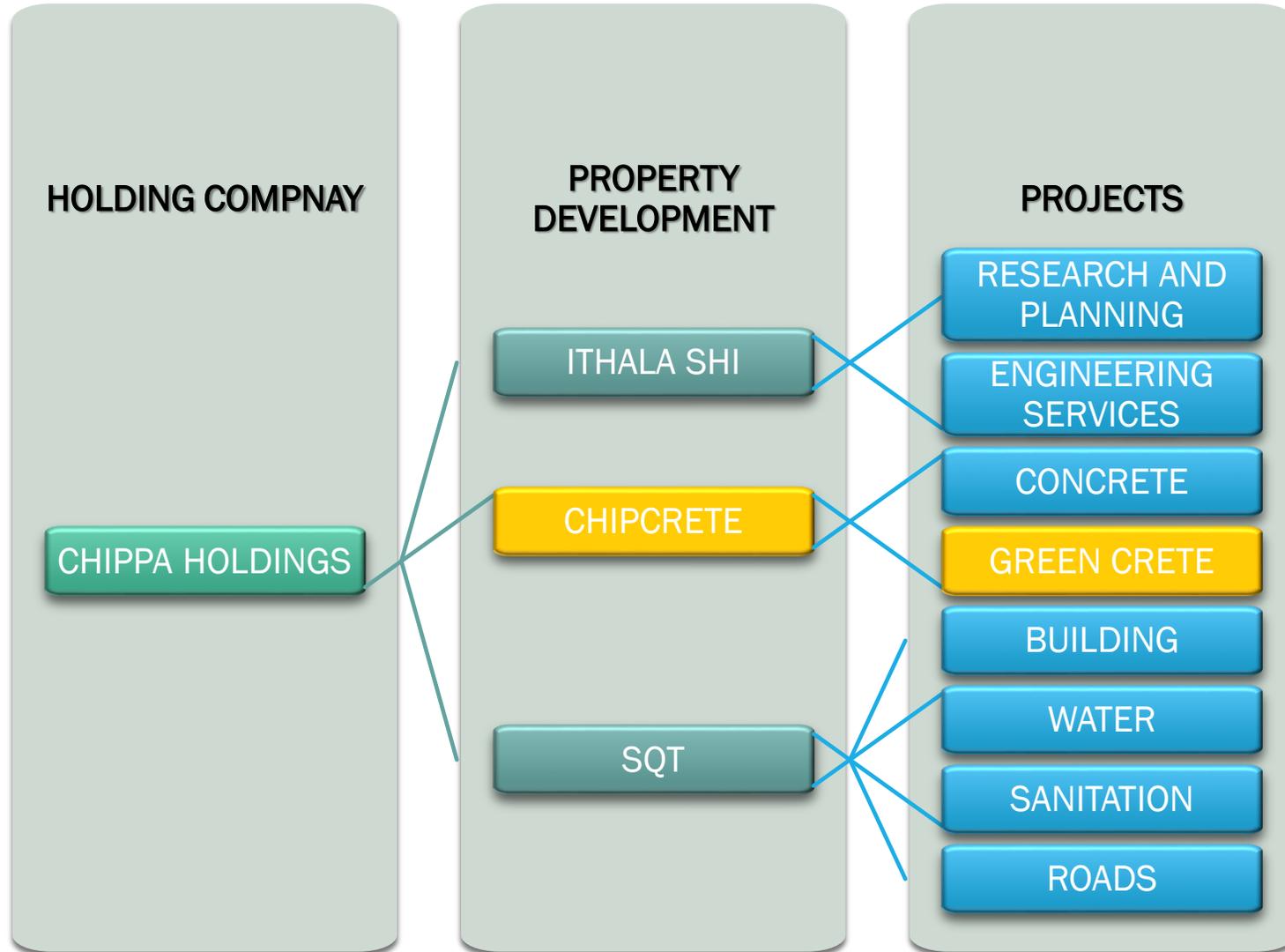
Our sustainability is to ensure there is efficient development, management of planning, acquisition, disposal, operation, effective maintenance and growth of our properties.

Mission

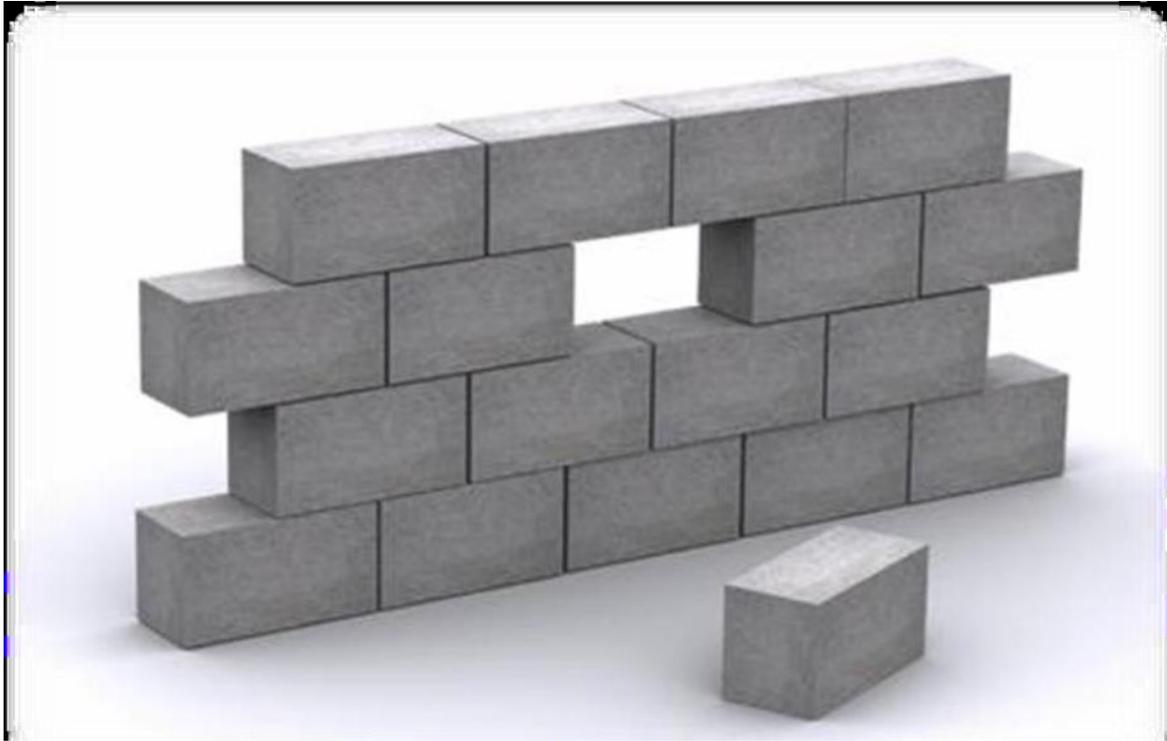
Through CHIPCRETE and SQT Building we are supporting the vision of Chippa Holding's strategic priorities which include economic and social development and the service delivery objectives of the Chippa Holdings.

THE STRATEGY FOR CHIPCRETE IS TO ENGAGE AND DEVELOP A SUSTAINABLE BUILDING SOLUTION.

COMPANY ORGANIGRAMME



WHO ARE WE



GREENE CRETE BUILDING SYSTEM (WALLING SYSTEM)

THE REVOLUTION OF WASTE REUSE STRATEGY



CURRENT HUMAN SETTLEMENT STATUS

1

WHAT IS THE PROBLEM ON THE GROUND

LUCK OF SUITABLE RESIDENTIAL LAND



ASBESTOS AFFECTED HOUSING UNITS



IT IS CRITICAL TO NOTICE THAT THE MAJORITY AFFECTED POPULATION IS THE YOUTH AND ELDERLY

CURRENT DELIVERY OF HOUSING UNITS

- “Housing projects have not reducing the percentage of households in informal dwellings. **The survey shows that 81,1% of all households resided in formal dwellings in 2018.** Although the percentage of households that have received government subsidy to access housing has increased from 5,6% in 2002 to 13,6% by 2018, **13,1% of households were still living in informal dwellings.** This could be attributed to the fact that rapid household growth and population relocation is making it very difficult to address existing backlogs in the face of fresh demands”.
- “In terms of the current delivery of subsidy homes in all the provinces, a minimum of 5% of the total Human Settlements Development Grant (HSDG) allocation for new structures (foundations, walls, roofs, finishes and services) may be set aside for IBTs and thereafter incrementally increased on its merits. The ring-fencing of the budget can occur at a Provincial level”.

STATISTICS SOUTH AFRICA, General Household Survey,
2018

The NHBRC's GUIDELINES FOR IMPLEMENTING IBTs



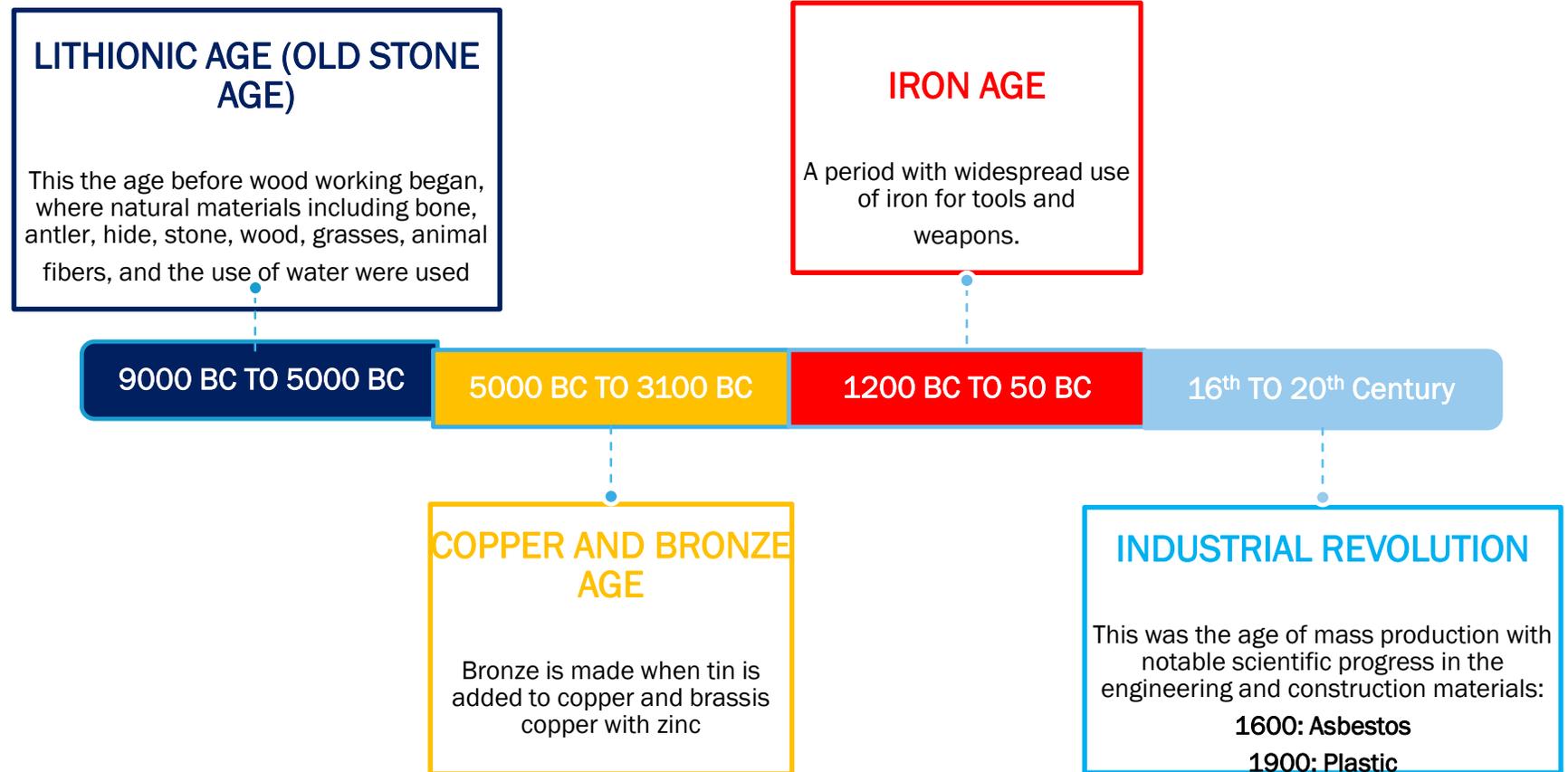
HISTORY OF HUMAN SETTLEMENT AND THE MATERIALS USED

2

HISTORY OF BUILDING MATERIALS

Notes:

- The progression of the development of human settlement brought about an advance in housing units and the materials used
- The building material have up until the 16th Century been environmentally friendly, with limited side effects to humans
- The industrial revolution brought with it two noticeable pollutants e.g Asbestos and Plastic

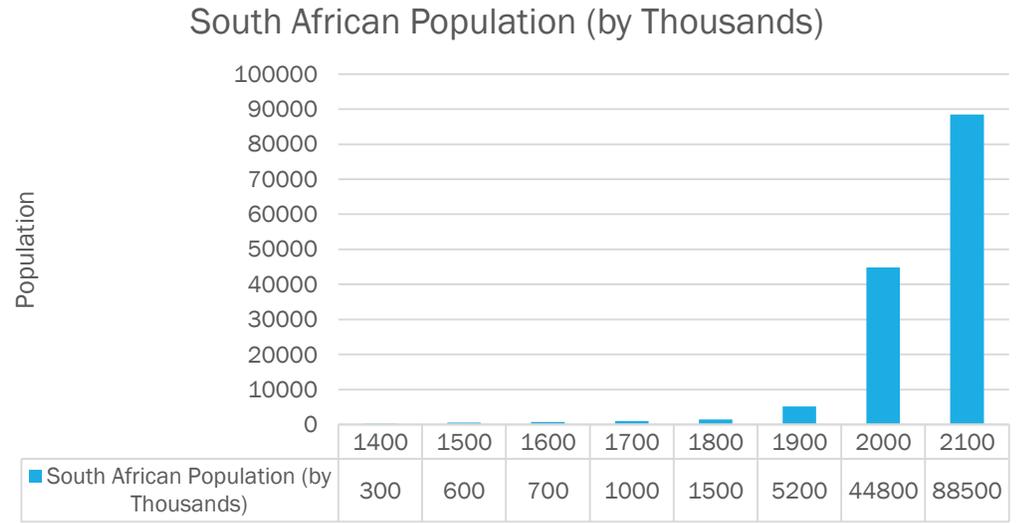
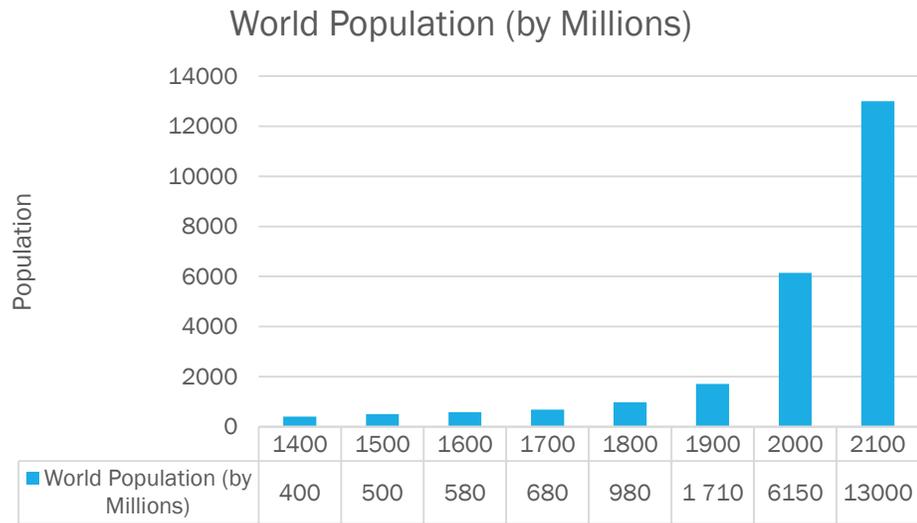


It must be noted that from the Middle Age from the 5th to the 15th Century the building materials alternated between the materials used in the past, with science accelerating the material development and manufacturing.

COMPARISON WITH OTHER BUILDING MATERIALS

| WALLING MATERIALS | Crushing Strength (MPa) | Water Absorption (%) | Behaviour in Fire Conditions (minutes) | Minimum Thermal Performance (m ² K/W) |
|---|-------------------------|----------------------|--|--|
| Concrete (Stone, sand, cement, Steel) | 28 | 8 | 180 | 1.2 |
| Bricks (Clay, Stone, sand, cement) | 10 | 15 | 240 | 1.9 |
| Timber | 10 | 8 | 30 | 2,2 |
| Drywall (Soundproof drywall is composed of laminated drywall made with a mix of wood fibers, gypsum, and polymers) | 0,51 | 12 | 120 | 0,2 |
| Polystyrene | 0,51 | 0,3 | 60 | 1.109 |
| Asbestos (Cement sheets and partition boards, chrysotile cement products) | 25 | 16 | 120 | 0.166 |

POPULATION GROWTH VS HUMAN SETTLEMENTS



- The population growth of South Africa follows the same trend as the world's population with an increasing population growth profile
- The disproportionate development is in the type of human settlement profile in this period, the Majority of South African's are still struggling to access quality building materials
- It is however our deduction is that the use of recyclable materials in the build environment will close this gap, and put RSA in the front with the development of IBTs

Natural Structures (**Caves**)

9000 BC



Stone, mud, grass and steel
Structures (**Mud Huts**)

9000 BC TO 1400s



Stone, sand, glass cement, steel,
and plastic Structures (**RDP**)

1400s TO 2100s

HUMAN SETTLEMENT VS ENVIRONMENT IN SOUTH AFRICA



Informal settlements (or slums) are defined by the UN as “urban areas without basic services such as potable water, sanitation, electricity etc., and characterized by poor housing, overcrowding, insecure tenure, and social exclusion”.

In Africa, over 60% of the urban population live in informal settlements, and rapid urbanisation in this region means this is likely to increase even further.

Environmental pollution is a major health problem around the world and negatively impacts the wellbeing, productivity and resilience of people.



Both air pollution and water pollution fall within the umbrella term of ‘environmental pollution’, and have traditionally been considered by scientists separately.



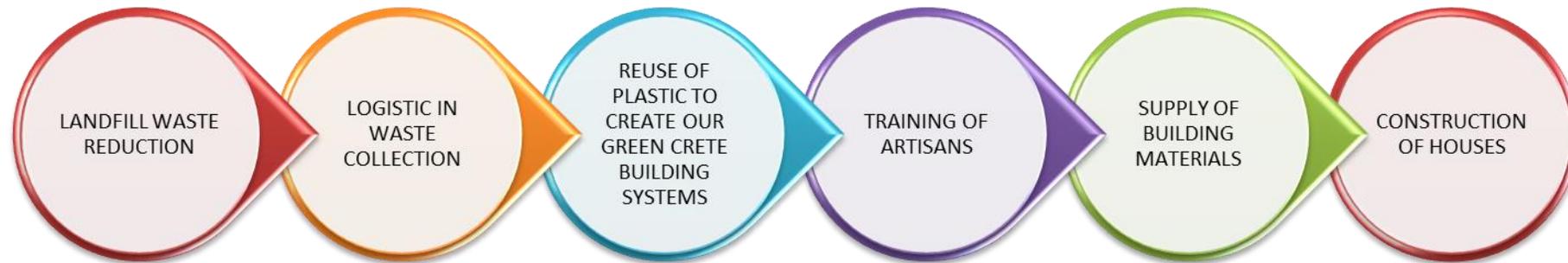


**THE NEED TO LOOK AT WASTE AS A
SOLUTION TO HUMAN SETTLEMENT
THROUGH THE MATERIALS USED**

THE WASTE ECONOMY

3

THE WASTE ECONOMY IN SUPPORT OF INNOVATIVE BUILDING TECHNOLOGIES



A 40m² RDP HOUSE REMOVES 5 500kg OF POLYSTYRENE FROM THE ENVIRONMENT (A TRUCK CARRIRES 2 HOUSES IN WASTE)



HUMAN SETTLEMENTS VS POLLUTANTS

- With the increase of population, and an increase in people who are moving to urbanized areas, the number of solid waste produced is increasing. South Africa's Department of Environmental Affairs and Tourism estimates that over half of the population of South Africa lack "adequate" solid waste treatment, instead, waste is often dumped, buried or burned.
- To manage solid waste South Africa has developed landfill systems as the means of waste disposal. Landfills have existed for over 5,000 years. Archaeological evidence of landfills dates back to 3000 BC in Crete, where waste was deposited in pits that were subsequently covered up with earth when full. A municipal landfill operated on the outskirts of Athens at least 2,500 years ago; residents were required to transport waste to the site, which was outside of the city gates, sparing the walled city from the stench of the open-air system
- *"South Africa's biggest problem is that we are running short of landfill sites. A landfill site in Pretoria recently closed down. Municipalities are travelling further out and incur more costs to dump waste. We should start encouraging South Africans to start recycling at home and not mix the recyclables with waste. Government policies are on the right track and in place to encourage recycling," Noble-Marie*

HUMAN SETTLEMENTS VS POLLUTANTS (CONTINUE)

■ “More than 300 million tonnes of plastics are produced annually, and there are at least five trillion plastic pieces floating in our oceans. Because deep-sea exploration is expensive and time-consuming, most studies on plastic pollution up until now had been close to the surface, showing a widespread level of plastic contamination in fish, turtles, whales and sea birds”.

■ It is for this reason that Chippa Holdings through its waste division is:

- Is recycling waste for reuse as the Green Crete Building System
- It is using the current waste stream municipal contracts it has to support recycling and reuse
- Plastic Waste is collected at source thus reducing transport costs to and from the landfills



Input recycling rate of
46.3%
for all plastics



34%
of South Africans do not
have access to any **waste
management services**



Plastics recycling sustained
7 892
formal jobs

Since 2009,
recycled
tonnages grew **64%**
and virgin polymer **21%**

More than

519 370 tons
of plastics waste were
collected for recycling



Growth in plastics
recycling **6.7%**
more than the
previous year



70%
of the plastics that were
recycled in SA during
2018 came from **landfill
and other post-consumer
sources**



An estimated
R 2 267 million
was injected into the
economy through the
**procurement of plastic
recyclables**



Plastics recycling saved
246 000
tons of CO₂
– the equivalent emissions of
51 200 cars!

SUSTAINABLE GREEN CRETE BUILDING SYSTEMS

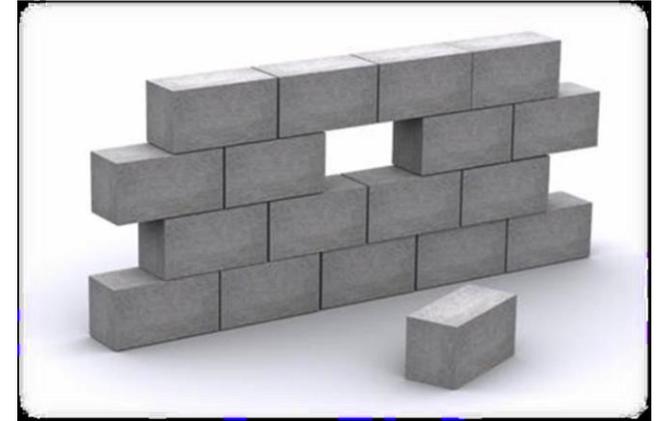
WHAT IS THE GREEN CRETE BUILDING SYSTEMS

The A combination of recycled waste, binding chemicals and emulsions used to create the most effective walling and building solution which not only save cost, but provide a quicker, more effective and greener product than conventional brick and mortar and dry-walling systems.

ADVANTAGES OF PLASTICS

The benefits of plastic are undeniable:

- The material is cheap
- Lightweight and easy to make.



REUSE OF PLASTIC TO CREATE OUR GREEN CRETE BUILDING SYSTEMS

ENVIRONMENTAL IMPACT

- The product reduces one truck of plastic waste going to the landfill
- The product reduces the amount of land required for a landfill
- The product uses 60% of Cement is reduced from the construction process
- The product uses 150 Litres of water in the wall and plastering building process, 60% less than the 260 litres required for brick and mortar (excluding the foundation)
- The house reduces energy requirements by 40% as it is able create a balanced temperature fluctuation between day and night

SOCIO-ECONOMIC IMPACTS

The Training Needs:

- Skilled artisans are not readily available in all construction sites
- SMEs in project areas demand 30% of the projects, but struggle with skills and financial capacity

Outcomes of Training:

- Work Opportunities created will be 23
- Cooperatives or Entities will be created and accredited for IBT and Conventional Building Methods

| BUILDING STAGES | LABOUR REQUIREMENTS (SKILLED) | LABOUR REQUIREMENTS (UNSKILLED) | DAYS REQUIRED FOR CONSTRUCTING A UNIT | REQUIRED NQF LEVEL TRAINING |
|-----------------------|-------------------------------|---------------------------------|---------------------------------------|-----------------------------|
| Foundation (Concrete) | 2 | 2 | 7 | 3 |
| Walling | 2 | 3 | 3 | 3 |
| Electrical | 1 | 1 | 2 | 3 |
| Roofing | 1 | 3 | 2 | 3 |
| Tiling | 1 | 1 | 1 | 3 |
| Carpentry and Glazing | 1 | 1 | 1 | 3 |
| Plumbing | 1 | 1 | 4 | 3 |
| Paint | 1 | 1 | 2 | 3 |
| TOTAL | 10 | 13 | 22 | 3 |
| | | | | |
| | | | | |



THANK YOU