Challenges and Successes in Human Settlements since 2005

Clay Brick Products Specifically Designed For Efficient Low Cost Housing

The challenge the industry faced in serving the nation's need for low cost housing was to provide clay brick products in formats that were more cost effective and improved the speed of construction, while still meeting the occupant's needs for security, comfort and low lifecycle costs.

Our objective was to come up with more cost effective masonry building solution within the Government subsidised housing framework that would have performance parallels with double skin clay brick construction's benchmark status for best house construction practice in South Africa.

Brick makers across South Africa have come up with a variety of masonry products to meet this challenge, importantly also addressing the impact that the different regional climate conditions pose. Notably, for the high rainfall coastal regions, manufacturers have developed brick formats that are narrower and higher than the imperial brick to facilitate double skin cavity walled type construction with all the benefits associated with conventional imperial brick walling.

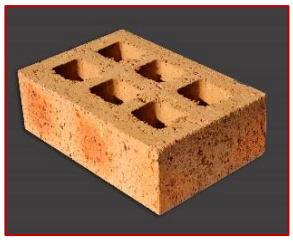
The Maxi 90 and Super Maxi 90 are examples that have been successfully applied in housing along the coastal belt of South Africa. Fewer bricks per m^2 provide savings in mortar and accelerate the speed of construction.

In the Inland regions, market demand has been more towards through-the-wall clay brick masonry and face finishes are found to resonate with a larger portion of the population. The industry has developed both face and semi face through-the-wall clay bricks that go by names such as CoroJem, the Jem, Quantum and the Coro Maxi 140. These have been successfully applied to provide "proper" housing as sought within the Government subsidy in all the Inland provinces.

So whether it's the alternative 90mm wide clay brick masonry as applied in double skin construction and/or the 140mm through-the-wall product, compliance with SABS 10400 XA building regulations is achieved, with the residents enjoying the unique benefits of clay brick in construction.

The benefits of the larger brick units are:

- Lower brick cost per m^2
- Less mortar and fewer joints per m^2
- Less mass per m^2 reduces transport costs and makes, laying easier
- Walls are built significantly faster than standard double brick walling
- Clay brick masonry comes with the requisite compressive strength to assure construction of superior quality in compliance the requisite building standards for masonry construction




The lifetime benefits however of these alternate brick products include:

Structural integrity: clay brick structures have proven integrity for 100 years and more

Longevity: Longevity provides opportunity for the bricks to dissipate their embodied energy over their long lifecycle

Non-combustible and fire proof: clay bricks do not normally suffer structural damage during a fire and therefore continue load bearing function

Ceramic properties: withstands saturation from flood water without being adversely affected structurally

Healthy environment: clay bricks have mineral properties that meet all necessary requirements for healthy living

Physical properties: clay bricks have a natural propensity to absorb moisture from the air when the relative humidity is high, and then return it when indoor air becomes dryer. This helps to regulate indoor humidity to the level recognised as necessary for healthy living (40%-60%)

Inorganic: Releases no toxic fumes or gasses under either normal or fire conditions.

Sound insulation: The high mass/density of clay brick naturally offers higher acoustic protection and quieter indoor environments

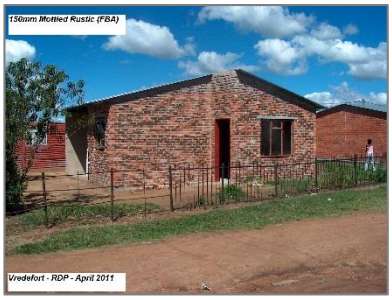
Durability: Low maintenance mitigates future carbon debt associated with refurbishment of less durable walling materials and systems.

Colour fast: Enduring hues and textures that eliminate carbon debt associated with painting.

Almost a billion of these products successfully used in low cost housing

Almost a billion of clay brick products have already been used successfully in low cost housing throughout South Africa – these are houses that meet the needs for occupants to live in safety, security and with dignity.

Our industry is committed to partnering with Government to help meet their pledge for 1.5 million houses by 2019. The Clay Brick Industry has both the capacity and the right products to deliver the best, the most cost effective long term solution to human settlements construction.




Low Cost Housing Energy Modelling Project

The challenge has been to understand and quantify the long term energy costs savings clay brick construction provides over alternative Innovative Lightweight building alternatives. In 2009 the Clay Brick Association (ClayBrick.org) began its research programme to identify which walling types and construction methodologies provided the best balance between first cost, lifecycle cost, thermal comfort, lifecycle energy consumption and achievement of dignity.

The first project was in respect of a 40m^2 low cost house. This research confirmed double skin clay brick constructions relative cost effectiveness compared to Light Steel Frame Building (the latter was chosen to represent lightweight IBTs in general). The research established clay brick construction as an inspired design choice for low cost housing, double brick construction affording low total greenhouse gas emissions (embodied plus operational energy) over a 40 year lifecycle.

Since that research ClayBrick.org has commissioned research in respect of a 130m^2 standard brick house with similar results. Simply put, clay brick can be specified in construction to afford optimal energy efficiency for houses here in South Africa, lowest heating and cooling energy in all six climatic zones of South Africa.

Life Cycle Assessment - Research into environmental impact

The Clay Brick Association is now in the process of finalising a full Life Cycle Assessment, with the research being undertaken with the University of Pretoria. This research is designed to accurately calculate the overall environmental impacts of clay brick buildings from initial production to overall operation, in terms of energy usage, water consumption, greenhouse gas emissions and recyclability. The research will also quantify socio-economic impacts of clay brick construction relative to alternate building technologies. The initial results of the research indicate clay brick "performs" extremely well in terms of wealth and job creation.

Wealth & Job Creation

The human settlements challenge is not only to provide houses, but also income opportunities so that South Africans can afford to live in and maintain these houses.

In terms of job creation 20,000 people are directly employed in brickmaking in South Africa through formal and informal brick makers. Currently 3.5 billion bricks are manufactured and sold per annum with more than 220,000 workers being employed across the building industry (brick makers, brick layers and plasterers and resellers). Initial results indicate that more than one million people benefit from clay brick manufacture, making this industry a major socio-economic contributor in the building sector.

Due to the low capital cost requirements, the barriers of entry by entrepreneurs to the building industry are low. This together with the wide use of masonry materials in both urban and rural areas of South Africa has resulted in more entrepreneurs being involved in brick and block laying than any of the innovative alternative wall construction types.

To assist small builders and owner builders maintain SANS standards and understand building regulations, the Clay Brick Association presents free lectures to both association bodies and academic institutions, and also provides detailed information, research and educational materials free on its website.



For further information:
The Clay Brick Association of South Africa (www.ClayBrick.org.za)