



FACTSHEET #01

The case for clay brick social infrastructure

Clay brick is the construction material of choice for sustainable infrastructure investment in South Africa, providing lowest lifecycle costs than less durable lightweight methods.

TECHNICAL CONTRIBUTOR

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		SECURE	SAVE	SUSTAIN	STYLE	 environment-friendly
						
		CLAYBRICK.ORG				
		BUILD A LASTING LEGACY				



THE CASE FOR CLAY BRICK INFRASTRUCTURE

The solid all round performance and life-time value that clay brick brings to infrastructure buildings remains unparalleled. However, local and international comparative research continues to add up, demonstrating why clay brick as a green building material is so perfect for thermally efficient sustainable construction in South African environments.

Extensive research in Australia of buildings with different wall construction types that was measured under real world conditions has proved the importance of high thermal mass clay brick walling envelopes for achieving superior thermal comfort in climates similar to South Africa.

In addition, research by the CTL Group in the US, delivered similar outcomes. Comparing different claddings (defined here as the exterior skin of the exterior walls) on a standard US house, across 10 different cities in the US, found that houses with an exterior brick skin cladding used less heating energy than lightweight clad houses in cities in the South Western climates, and less cooling energy in all locations.

Compounding clay bricks green value proposition, cradle-to-grave life cycle assessment research data generated by the National Brick Research Centre of Clemson University, found that energy consumed and pollution generated in the manufacture of a unit area (ft') of different walling materials over their warranted life, clay brick outperformed Fibre Cement and Exterior Insulation Finishing System (EIFS).

TOTAL ENERGY CONSUMED BY BUILDINGS AND GHG EMISSIONS

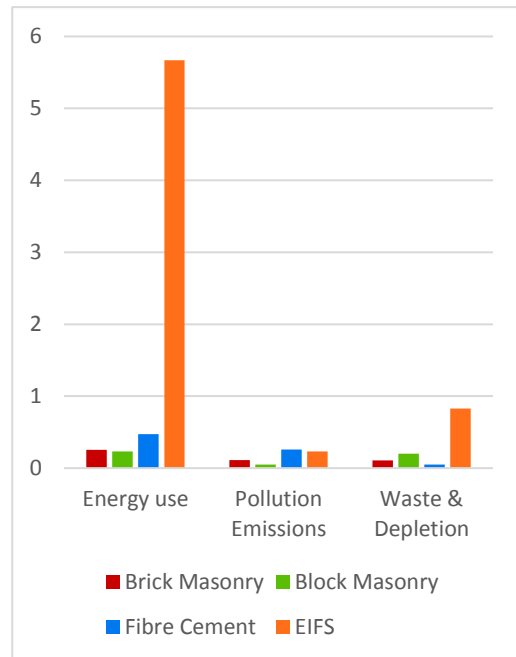
Insight is provided by the full Life Cycle Assessment (LCA) by Energetics in Australia, which assessed different Australian wall construction types, applied to two house designs situated in three climatic zones and placed in four orientations.

The LCA found that the thermal performance attributes of clay brick cavity construction afforded a lower total energy consumed (embodied plus operational, including heating and cooling energy) than insulated lightweight weatherboard in most situations. When resistance/insulation was applied in the cavity of the double clay brick walls, those buildings outperformed insulated lightweight weatherboard in all situations, with clay bricks superior life cycle providing for these benefits to compound into the future.



Fabricated lightweight walling associated with Innovative Building Technologies such as LSF and Kwikspace Modular Building does not have the requisite thermal mass in the walling envelope to self-manage heat flows and support thermal comfort conditions for longer through the seasons, as does clay brick.

The net effect is, for example, that learners and teachers accommodated in fabricated lightweight have to deal with all the difficulties that come with "hot box" environments in summer, and in the case of clinics and other infrastructure, high cooling energy expense.



**Credit Research Data - National Brick Research
Centre Clemson University - USA**

Data	Brick Masonry	Block Masonry	Fibre Cement	EIFS
Lifespan	100 years	50 years	50 years	5 years
Weight per ft 2	35.5lb	42.8lb	2.3lb	1.24lb
Recycling opportunity	Brick 100% Mortar: 40%	80%	0%	0% ¹
Recycling energy use	0.252	0.228	0.328	5.48
Pollution Emissions	0.011	0.005	0.026	0.023
Distance travelled	175 miles	100 miles	365 miles	300 miles ²
Distribution: Energy	0.004	0.004	0.146	0.189
Waste & Depletion	0.108	0.203	0.048	0.828
TOTAL ENERGY	0.256	0.232	0.474	5.669

Energy is measured in kWh per foot per year.

EIFS - Exterior Insulation Finishing System (Synthetic Stucco). Composite EIFS are associated with Innovative Building Technologies such wall cladding comprising a layer of foam plastic insulation, a reinforced layer applied to the face of the insulation and a final top coat or finish.



NOTES

1 No proven method available.

2 Low weight per truckload influenced results.

Clay brick is the best construction material for sustainable infrastructure investment in South Africa, given

- its timeless natural beauty
- that clay bricks mineral properties provide internal environments free of volatile organic compounds - the latter resulting in better health, comfort and wellbeing
- that clay brick is recognised as providing lowest lifecycle costs than less durable lightweight methods and
- that clay brick buildings convey a message of quality, image and prestige for communities.

For further information:

The Clay Brick Association of South Africa

Website: www.claybrick.org