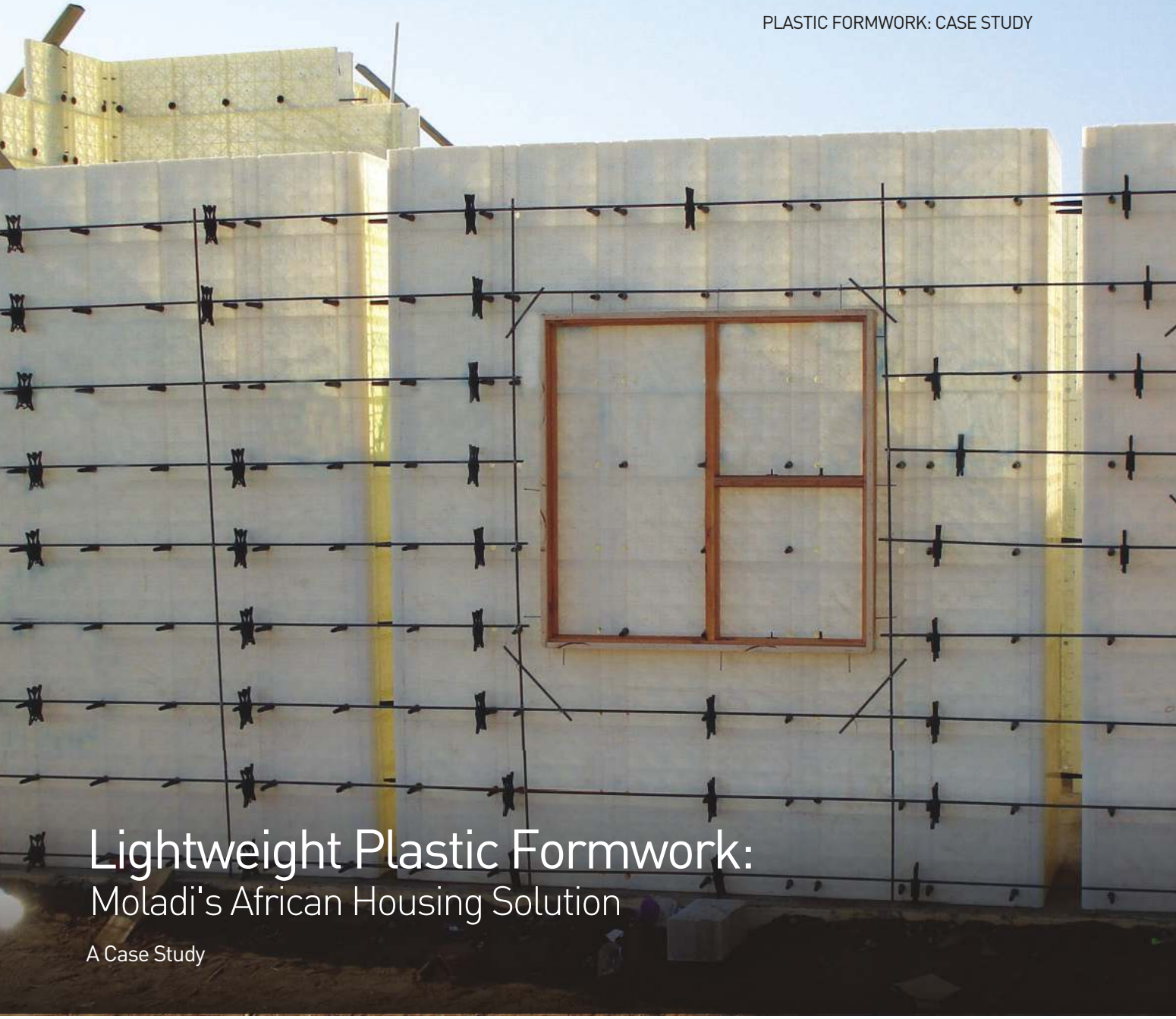

# Lightweight Plastic Formwork:
## Moladi's African Housing Solution

A Case Study

The Moladi system involves the use of a unique removable reusable recyclable and lightweight plastic formwork mould which is filled with an aerated SABS approved mortar to form the wall structure of a house in only one day. The process involves the assembly of a temporary plastic formwork mould the size of the designed house with all the electrical services plumbing and steel reinforcing located within the wall structure which is then filled with a South African Bureau of Standards approved mortar mix to form all the walls of the house simultaneously. This method eliminates the time and labour intensive work of chasing beam filling plastering and generates no waste. All Moladi structures have steel reinforced internal and external walls. The reinforcing design is specified by an independent structural engineer, who independently certifies the structure after construction is completed and the final inspections are carried out. The result is a fast track cost effective and transferable construction technology that is amortized over 50 re-uses, which reduces the cost of construction and transportation significantly. This also facilitates the possibility for many in situ structures to be built in just one day.

Africa is a rapidly urbanising continent, which according to the UN Habitat, is increasing at a rate of 230,000 people who are moving into cities across Africa each week. Currently, sub-Saharan Africa alone has an estimated housing deficit of 30 million units and every year, the backlog of houses across Africa's 54 countries collectively increases by 4 million houses.

With the population of the African continent expected to reach a staggering 2 billion people by 2050, almost twice the population number estimated in 2010, it is a stark reality that every year, there will be more and more people needing homes, over and above the current demand.

Although the extensive and many complex difficulties, relating to the delivery of affordable housing in Africa is well documented, the ever-increasing demand

Moladi on-site training of local unskilled labourers

Moladi's lightweight panels allow for easy handling

for housing keeps mounting and continues to be a major concern. Projections by the United Nations would indicate that 53% of Africa's inhabitants would comprise the urban population, of which 62% of city dwellers would reside in slums or informal settlements. What's more troubling is that it appears that the incentive to move to the cities in Africa seems to be completely independent from economic growth and development; and this is not expected to ease in the foreseeable future.

There is no doubt that the challenge facing the continent is a colossus, but the question is, whether conventional building methods are able to cope with the ever-increasing demand for quality homes. Throughout history, man has become more sophisticated through technology; made improvements on existing standards and norms, which have ultimately been determined and developed according to the needs of the people. Perhaps the advances and progresses in communication and transportation during the past two centuries are the most evident of such improvement enjoyed by civilization. However, even though the need for housing has always been a fundamental requirement to sustain one's health and welfare, the advances in this area have been somewhat meager in comparison. The brick and mortar method of construction was recorded as early as 1458 B.C, which means that very little has changed in terms of building structures over a period of almost 3.5 millennia. With the demand and requirement currently facing us as Africans, we cannot expect to resolve the housing crisis in our age with a technique developed for the requirements of society 3473 years ago.

One such innovation is the award-winning Moladi building system, which looks at incorporating green technology and sustainability to provide the best solution to address the six key challenges that hinder the successful implementation of low-cost housing projects in Africa; namely, lack of sufficient funds, shortage of skilled labourers, lack of resources, work flow control, time constraints and wastage. The Moladi construction system was founded in South Africa during 1986, and has been in successful operation for the past 29 years. Moladi's founder and designer, Hennie Botes, developed the innovative building technology as a means to alleviate many of the cumbersome and costly aspects associated with conventional construction methods without compromising on the quality or integrity of the structure. According to Botes, "Moladi looks at what has to be achieved now and builds on the knowledge and expertise of yesterday in order to develop sound methods to exceed the needs and expectations of ordinary people."

A middle-income 3 bedroom, 2 bathroom Moladi house

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The Moladi technology components are manufactured and produced in Port

DAY 1

Moladi formwork panels, reinforcing steel and services erected

DAY 1

Moladi mortar mix cast in formwork cavity

DAY 2

moladi formwork panels removed

DAY 3

moladi formwork re-erected on the next foundation

Elizabeth, which is the 5th largest city in South Africa; a port city on the Indian Ocean coastline and situated halfway between Cape Town and Durban. They currently export their building system to over 17 countries worldwide, of which eight are members of SADC (South African Development Community). Exporting Moladi to the African market is relatively easy as it can be transported to virtually any part of the world, including remote rural areas and informal settlements. An added advantage is that Moladi is not restricted through the use of heavy construction equipment and machinery in order to build with Moladi. Even the absence of electricity would not hinder the building process. Moladi-Tanzania is one of their distribution points which are making great strides toward reducing the housing deficit. They are currently working on the Vicoba Moladi Housing Project, which involves the collaboration of Moladi-Tanzania and Vicoba Microfinance and Development Company to deliver a total of 9,000 housing units to low-income earners through community based projects.

A 52sq meter subsidy Moladi housing unit in South Africa

Multi storey Moladi duplex apartments in Botswana

In recent years, there has been a steady increase in the development and availability of alternative building technologies in Africa, such as prefabricated building systems, from all over the world; many only hoping to capitalize from the growing demand for affordable housing in the African marketplace. Very few however have a track record which spans 26 years, or are socially acceptable to the African market. What most often seems to be overlooked is that, for most Africans, houses are also a reflection of their societal and are considered more than a simple shelter. Botes says that Moladi is able to accommodate any type of roof design or covering, any finishing material, any type of window or door, so there are no limitations or restrictions in terms of adapting Moladi to facilitate cultural design preferences. Notwithstanding the aesthetics and social acceptance of the structures, Moladi is accredited by numerous global building authorities and the building method conforms to international building codes of good practice. It has also undergone extensive testing by the South African Bureau of Standards (SABS) and the University of Panama to ensure that the resulting structure is durable and of the highest quality which has the key advantage of being able to withstand earthquakes and cyclones as it is a monolithic structure.

While a building technology such as Moladi will not resolve all the challenges faced by the African continent, it is clear that the use of a tried and tested and socially acceptable affordable housing system will improve service delivery and the lives of millions of poverty stricken families in Africa through its innovation.◆