INTRODUCTION
The vast number of roadside hollow concrete building block manufacturers in the outskirts of the City of Tshwane Metropolitan Municipality indicates that there is a demand for this product. This demand is reflected in the number of houses and rooms being built (legally or illegally), shacks being enclosed and boundary walls being erected. A 190 × 140 × 390 mm block typically sets the buyer back R5.00 (VAT is but a mere acronym). The materials used in the manufacturing of the blocks also pack a surprise – masonry cement (CEM 22.5X) is often used as a binder and clinker aggregate is sourced locally from house to house. These low strength, poor durability, crudely manufactured roadside hollow blocks are exactly the reason why we should “knock the block”.

The discerning structural engineer is probably cringing by now – how can the writer use masonry terminology so loosely with scant regard of the National Building Regulations (NBR) and Building Standards Act, i.e. the words “brick” and “block” do not feature anywhere in the nomenclature of any South African Act or SANS 10400-K:2011: The South African National Standard, The Application of the National Building Regulations – Part K: Walls. The fitness of purpose of masonry walling is dependent on one thing only, i.e. whether the masonry unit is of “hollow” or “solid” format (except when guidance is given for control joints). The type of material used and whether it is of brick or block format are irrelevant.

For the sake of clarity, and to accommodate the local building industry, masons (brick and block layers) and other professionals, the incorrect terminology and jargon will be used henceforth.

RECENT ADVANCES IN HOLLOW CONCRETE BLOCK
Advances in hollow concrete block masonry in the use of housing over the last four decades have alerted specifiers to its many uses. Concrete masonry has excelled past addressing the pressing need in affordable housing, and in its heyday demonstrated significant possibilities for design and architectural masonry. Much of the credit must go to the industry’s professional bodies that have shown the way forward through information...
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programmes, conferences, technical publications and national standards organisations, such as the Concrete Manufacturers Association (CMA) and The Concrete Institute (formerly the Cement and Concrete Institute) in South Africa.

One of the most adaptable products known to man, concrete has long been a natural choice for any type of construction project. With advances in concrete manufacture, particularly in the United States of America, and housing shortages in South Africa, hollow “concrete block” became recognised as a panacea for all kinds of designers’ headaches, since the need to build on a large scale was paramount.

AN UNFORTUNATE REPUTATION

Through its vast number of applications, however, concrete block masonry acquired the tag of being a poor-man’s product. The many Reconstruction and Development Programme (RDP) housing developments only added to its image as a soulless, catch-all product, and a lack of care in architectural detailing and structural specification in the design of housing, especially concrete block housing, became apparent in certain large construction projects.

Concrete blockwork had by the 1970s unfairly acquired the reputation of being a downmarket building material. During this same period, but more notable of recent, the structural and serviceability failures of buildings built using crudely manufactured roadside concrete building blocks, have really tarnished the reputation of the concrete block industry.

The current SANS 10400 XA energy usage requirements furthermore “knock the block”. Sometimes pursuing green building can have unintended consequences, especially when it becomes the overriding focus, as opposed to focusing on the broader issues of sustainability.

But even with this unfortunate publicity, concrete blockwork has become unrivalled as a cost-effective method to provide a masonry envelope for housing, especially affordable housing.

IMPROVING STANDARDS

The manufacturing of concrete masonry improved over the years due to the introduction of a national manufacturing standard (SANS 1215: The South African National Standard for the standard specification for concrete masonry units).

Its position in the market was further strengthened by rigorous product development, quality assurance and the improvement in dimensional manufacture of blockwork, largely due to the use of sophisticated block-manufacturing equipment. At the time there was a proliferation of reputable concrete block manufacturers, as the demand for concrete...
During the Eurocode summit held on 8 February 2008, organised by the Joint Structural Division of South Africa (JSD) and hosted by the South African Bureau of Standards (SABS) in Tshwane, the decision was taken to adopt Eurocode 6 (Design of Masonry Structures). The summit was attended by representatives of major stakeholders in the materials, design and construction industries in South Africa. The adoption of Eurocode 6 requires the development of South African Annexes; this process is far advanced and, once completed, will give access to a proliferation of supporting masonry and test standards accompanying the manufacturing of masonry units (including concrete masonry), ancillary components, mortar, rendering and plastering.

THE INDUSTRY TODAY

Recently concrete masonry unit manufacturing has dwindled, especially in Gauteng, due to lower market demand, and informal manufacturing. Currently only a limited number of CMA members are manufacturing hollow concrete blocks. Most of the block manufacturers in Gauteng have ceased production, and manufacturers elsewhere have become unprofitable or are finding it difficult to keep their doors open, with the Western and Eastern Cape seemingly the exceptions.

In the provision of formal housing there is simply not enough housing stock overall to meet the demand, and there has not been for a while. The shortage is most pronounced in low to middle-income suburbs in metropolitan cities such as Johannesburg and Pretoria. On the whole, the residential property market continues to look promising, yet concrete block manufacturers are ceasing production of concrete masonry units and tend to rather focus on other precast concrete units to maintain business sustainability.

The reason for this conundrum must lie in the downturn of the economy and the effects of the rating downgrades that are beginning to hit home. Manufacturers state that there are not many low-cost housing projects on the cards, and they as manufacturers are stretched to the extreme as creditors.

WHAT ABOUT ALTERNATIVES?

Innovative building systems are always mooted as a magical quick-fix solution to the housing problem, but none of these have ever been successful or economically viable in the long run.

THE CONCRETE BLOCK STILL HAS A PLACE

The NBR are generally functional in nature, in the sense that they do not prescribe how a building should be constructed, but rather stipulate the qualitative performance requirements that the building design or construction of the building must satisfy.

To facilitate the use and application of the NBR, the functional regulations are supported by a set of deemed-to-satisfy rules which are published in SANS 10400, The Application of the National Building Regulations – Part K: Walls. The deemed-to-satisfy provisions describe design and construction methods, materials and solutions which, if applied, will ensure that the building so designed and constructed will satisfy the functional requirements of the regulations.

Hollow concrete block masonry manufactured to a specified minimum standard fully complies with the NBR, and the use thereof is accepted nationally by financial institutions.

It is important to distinguish whether a masonry unit is of “brick” size, requiring one hand to lay, or “block” size, requiring two hands to lay. The larger size unit results in higher productivity and will decrease the amount of mortar required. Generally “blocks” are more cost-effective, provided the unit is based on the principle of modular coordination, i.e. the 100 mm module (see Figure 1).

Admittedly, when the economic upturn comes, there will be a couple of obstacles to overcome, such as enticing the formal concrete block manufacturers back and addressing countless masonry skill shortages. The one thing the market can depend on, though, is a “concrete” solution to the housing problem – the hollow concrete block, fully compliant with the National Building Regulations and supported by four decades of technical nurturing.

CONCLUSION

The hollow concrete block has had a troublesome history, but when the time is right it will be called on again – an undervalued all-rounder.

REFERENCES

EN 1996-1-1: Rules for reinforced and unreinforced masonry.
BS EN 1996-1-2: Structural fire design.
BS EN 1996-2: Selection of materials and execution of masonry.
BS EN 1996-3: Simplified calculation methods.