

True modular construction can house the nation

Modular construction, based on the use of concrete blocks as opposed to bricks, is an internationally proven masonry system, which if properly applied, can do much to alleviate South Africa's housing shortage. However, this will require a change of attitude, as well as the re-introduction of genuine modular construction which proved so effective in the construction of affordable housing in the seventies and eighties.

When first introduced by Concrete Manufacturers Association (CMA) member Columbia DCM in 1978, modular construction was based on an international standard and was SABS approved. The system was similar to the child's block building game, Lego, in that a complete range of complementary blocks, such as corner, half and quarter units, were supplied in addition to the standard straight block.

Just as complementary blocks are an essential ingredient to successful building with straight Lego blocks, so it is with successful modular masonry. Wastage

incurred through chopping straight blocks to size is eliminated (and) laying is much quicker. In fact the whole process is much more economical than building the same sized structure using imperial-based brick masonry.

The CMA's Cape representative, Günter Koch, says there were some notable successes in the early days of large scale housing delivery when the City of Cape Town issued several contracts, each of which entailed building 5 000 economic houses. These were built efficiently and on time by three large construction companies. In

addition, they offered training in modular construction and many of today's highly skilled and efficient sub-contractors were recipients of that training.

Koch observes that in those days the rate of housing delivery using modular block construction topped eighteen 65-70m² houses a day during favourable summer months and 12 units a day during the remainder of the year. Some 35 000 houses were built in Mitchells Plain using Columbia DCM's cavity wall construction system during that period.

"We should be building at least 16 000 economic houses a year in the Western Cape alone where over 450 000 families are waiting for housing. As things stand now if we are building, say 5 000 35-40m² houses a year, it's a lot. With the re-introduction of full and proper modular construction, as well as improved economies of scale, great progress would be made in housing the homeless. All it takes is the will to do it and the discipline to follow though.

"Today uneconomic delivery of badly-built houses is the norm. One of the reasons for this is that housing managers and specifiers do not appear to understand the economic advantages of modular construction and therefore fail to insist on its full implementation i.e. the incorporation of complementary masonry units in their designs and specifications.

"This has led to the construction industry and block manufacturers abandoning true modular construction, replacing it with a crude and unproductive alternative which relies on the sole use of straight blocks. Experienced building inspectors are a rarity and other supervisory organisations are not guiding or mentoring SME builders in adhering to the correct procedures.

"Not only is the current approach unproductive, the rate of construction, being far lower than that of truly modular masonry, but it is also a wasteful process.

"I recently attended a ceremony at Taffelsigt on the Cape Flats in which Cape Town's mayor, Helen Zille, presented keys for some economic houses built with modular concrete blocks. Everyone was struck by the mess created by the discarded remains of broken and chopped blocks, and frankly speaking, it was embarrassing.



Visitors and children assemble in one of the halls of the MaAfrika Tikkun Child and Youth Development Centre in Diepsloot prior to the official opening of the community centre. The excellent concrete block masonry work is clearly visible. The blocks were manufactured by CMA member, Watson Concrete, and laid by Diepsloot community members.

"Moreover, the Council actually specified complementary blocks, yet only full blocks were ordered by the contractor, despite the fact that the company supplying the blocks had complementary blocks in stock. It would seem the main contractor simply could not be bothered to take advantage of the tremendous benefits to be gained by using complementary blocks. Instead, the sub-contractors were left to manage as best they could.

"Property developers, builders and block manufacturers have forgotten, or chosen to forget, that modular construction offers considerable advantages. It also appears as if today's contractors don't want the hassle of guiding and training workers to use complementary units. Furthermore, modular construction entails applying a considerable degree of precision in the correct laying and placement of blocks for which bricklayers are either not prepared nor able to apply.

"The CMA believes it is incumbent on national and local authorities to insist on the implementation of proper modular construction, not only at the tender process stage, but during the building process through their own inspectors and with the assistance of NHBRC inspectors. Today's building industry only needs to recall what it has forgotten and re-introduce building methodology which first saw light of day 30 years ago. Productivity will increase, wastage will be almost totally eliminated, and most importantly, the quality of the finished product will be vastly improved," observes Koch.

Another aspect contributing to the demise of modular construction is that it has never been treated as a discrete skill by the South African Qualification Authorities (SAQA).

"Instead, it has been relegated to Cinderella status and treated as an add-on to traditional brick laying courses. Over the past 10 years the construction CETA has failed to recognise the necessity to separate brick laying from block laying. These are distinct skills and should be treated as such.

"This is about to change. Late last year the CMA took the initiative and developed trainee and facilitator training material for modular construction. The course



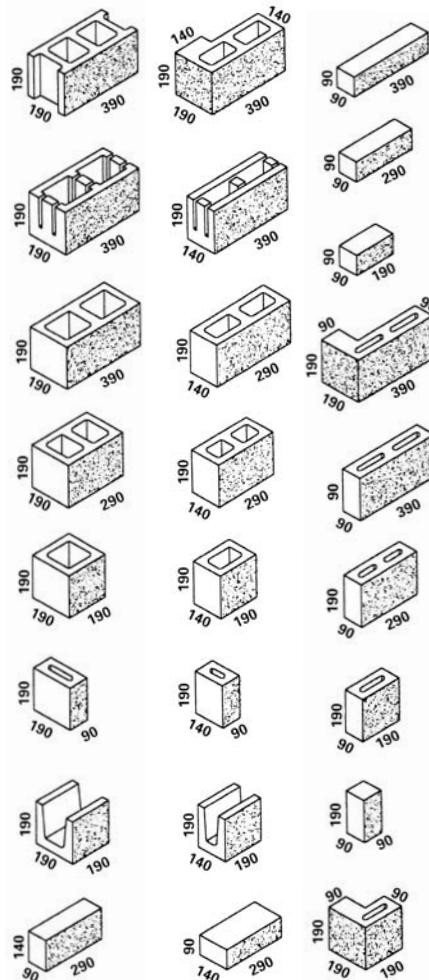
True modular construction can be both practical and aesthetically pleasing, as this example clearly demonstrates at The MaAfrika Tikun Child and Youth Development Centre in Diepsloot north of Johannesburg, where this crèche was one of three buildings constructed with genuine modular block masonry.

material comprises nine core modules and 120 credits. And as from the beginning of this year the CETA will allow training providers to make use of the new training material and thereby treat brick and block-laying as separate skills. A lengthy process of obtaining SAQA certification still lies ahead of us. However, the fact that we can start using the training material should do much to re-establishing modular block construction as the most

cost-effective masonry system, not only for economical housing, but for high-rise buildings, community centres, schools and shopping centres, as well as many other structures.

"One of the other challenges we face is for structural engineers to become attuned to the significant benefits of modular construction. Most of them appear to have little knowledge on load-bearing masonry principles and practice, and the assertion that South Africa lags 50 years behind countries like the United States and Australia in high-rise load-bearing structures is no exaggeration. The fundamental problem appears to lie with the universities which, to the best of my knowledge, do not include load-bearing masonry as part of the civil and structural engineering curriculum. This could be overcome, however, with an additional FET programme.

"Unlike some leading masonry construction countries, South Africa makes little use of high rise modular construction, and when it does, it is often incorrectly deployed. Not so in the United States, where a 28 storey 4 000 room hotel was built in Las Vegas using the modular block system 15 years ago. It is worth noting that steel usage on this project was significantly less than an equivalent conventional frame would have required. The project took 29 weeks to build which is considerably faster than most other forms of construction. There is no sound reason why this can't be achieved locally as we certainly have the brain-power. All it will take is the courage to grasp the nettle and implement something new and profitable," concludes Koch. ■



(Left): The complete range of modular construction concrete blocks.