

BUILDING A BRIDGE FROM THE STUDIO TO THE TOWNSHIPS

by Amira Osman

Moving the architectural studio beyond the confines of the university campus is enabling students and researchers in urban environments and housing research at the University of Pretoria to transfer information on construction and housing to locally-based small-scale enterprises.

The researchers want their project to play a more significant role in testing alternative approaches to development, and housing in particular, by changing the way the University engages with the community in which it operates.

This process could contribute to the development of a more enlightened approach to professionalism – challenging elitist, expert-driven approaches of the past and acknowledging and respecting local ways. Importantly, the project will improve practice through the application of the wealth of knowledge available at universities.

The research project explores how technological know-how may be shared through a participatory development mechanism in architectural design and practice in a South African context. In the process, experiential learning in the teaching of architecture is investigated and alternative development strategies implemented. Ultimately, the project aims to achieve long-term cooperation between the University of Pretoria, local industries and communities in the region.

Researchers will follow a workshop approach with the motto of “knowing by doing”, using existing builder’s yards and building sites as locations for technological and cultural exchange. Taking locally available skills as a starting point for a design process needs to be tested, in a sense reinforcing the idea that technological innovation has to adapt to local capacities and not vice versa.

Mamelodi and Nellmapius

The study is restricted to Mamelodi and Nellmapius, two townships in Pretoria





East. These townships are positioned away from the city and are not easily visible or accessible – typical of apartheid planning. The townships are not far from affluent suburbs, so the integration of these townships into the city structure promises to be an interesting challenge.

Mamelodi and Nellmapius are mostly comprised of monofunctional residential areas, isolated from the CBD and job opportunities, with poor quality housing and large informal settlements. As typical dormitory towns, they do not have viable economic cores and sufficient job opportunities, in spite of housing a large proportion of the city's population.

Existing dynamics are being investigated in terms of their physical, political, historical, social and economic characteristics. An initial analysis of the area, in consultation with a local resident, has helped identify small-scale, formal and informal industries in terms of operation methods, material suppliers, techniques, economic viability, legislative restrictions, target groups, clients and legality.

Locations and types of industries were documented with the intention of participating on location. This would lead to the development of the techniques already being used to benefit the construction of houses and communal facilities, and the exploration of other possibilities such as the design and implementation of partitioning systems and furniture.

Addressing informal settlements

Current government approaches now reflect a better understanding of concerns in housing and the dysfunctional structuring of South African cities. The new approach

aims to address these problems through a comprehensive plan for the sustainable development of human settlements.

The Breaking New Ground policy claims to permit flexible application and hopes to facilitate innovation. More research, however, needs to be done to investigate how Breaking New Ground may address the issue of informality. This change in concepts regarding professionalism and governance would probably create a new paradigm that would re-direct policy and professional efforts towards the needs of the poor rather than the middle class.

Control and emergence

Designed and emergent systems are seen to be equally important in this possible new dispensation. Practitioners and policy-makers need to develop a heightened sensitivity to various forces of urbanisation. The perception that limited funds mean poor quality or that low cost means that a flexible, enabling, inclusive, accessible environment catering for the needs of all sectors of the target population cannot be addressed through creative design, also needs to be challenged.

The research methodology

An adaptive research strategy is adopted; proclaimed the most intelligent strategy (Jones, 1976) in this case, as the way forward is always determined by the latest available information as new partnerships are established and new energies identified.

Participatory Action Research (PAR) is a widely used method. It attempts to render development assistance more responsive to the needs and opinions of local people, an alternative approach to development projects usually implemented through a

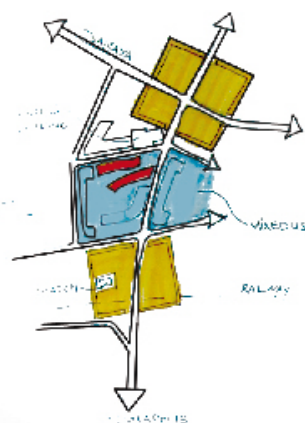
technocratic process. The researcher is viewed as a change agent, who is required to be independent of macro-social organisations. In the process, research is transformed into an interactive communal enterprise.

Community champions

As the research progresses, it is quickly becoming apparent that the idea of catalysts is key to understanding the setting and the identification of potential collaborators and projects. Some individuals are perceived as "institutions" and champions in their communities: in the sense that they are known, respected, accepted and that many activities seem to either be initiated by them, supported by them or revolve around them. Identifying these individuals is paramount to the success of this project. Collaborating with a variety of people in a given community may mean greater possibility for detecting where and how interventions could have significance. Small projects are seen as vehicles for collaboration, development and learning. While these projects may be spatial in character, some are not. Operating from a design department that comprises the three fields of architecture, landscape architecture and interior architecture (including product design), the interventions are anticipated to cross the various scales and levels of the built environment.

Assistance

This three-year research project is funded by the Research and Development Programme of the University of Pretoria and the NRF Thutuka programme. Financial support has also been obtained from The Netherlands via a contact at the Technical University of Eindhoven, as well as the Social Housing Focus Trust, the Holm





Jordaan Group, Fassler Kamstra & Holmes Architects and Prof. Schalk le Roux of the University of Pretoria.

The University's Unit for Development Support will assist with the implementation of these projects. The research work is geared to the development of specific technological solutions. With more partners, the possibilities for viable solutions to emerge are increased due to diverse approaches.

The University's Department of Architecture acts as a coordinator between the local community and other partners. An agreement has been formalised with the Department of Mechanics of Material and Construction (MEMC), Vrije Universiteit, Brussels, and others are in process with the *Dipartimento di Progettazione e Studio dell'Architettura Università degli Studi di Roma*, Italy, and the Technical University of Eindhoven, The Netherlands for collaboration on this particular project. The researchers are also in contact with various industry representatives, such as the South African Institute for Steel Construction, with specific interest in lightweight steel frame systems suitable for housing, as well as other foreign companies intending to experiment with various building systems in South Africa.

The creation of a Centre for Research and Technology, CReaTe, has been suggested. The intention of this centre is to transfer technical knowledge to small, medium and micro-sized construction enterprises. Knowledge gaps in the construction sector will be identified and services will be offered to existing enterprises in the sector, as well as assistance in the development of new

enterprises where there is a need. CReaTe aims to support these businesses in the process of becoming efficient, competent, competitive and financially viable.

An NRF-sponsored workshop is being organised for May 2007 by the Urban Environments and Housing Research Field, in collaboration with two working commissions of the International Council for Research and Innovation in Building and Construction (Open Building Implementation and Informal Settlements and Affordable Housing), where researchers from various countries will investigate the concepts of this project with a focus on the relevance of Open Building in South Africa.

Application of knowledge

It is hoped that a process for the application of knowledge can be established and that the results of this project may be seen on the ground in real projects upon its conclusion. Participatory approaches in design can only be explored through real-life projects. This approach has led to questioning the very definition of architecture. Through experimental action research it is hoped that the skills needed for operating in a changing professional environment can be achieved.

CURRENT PROJECTS

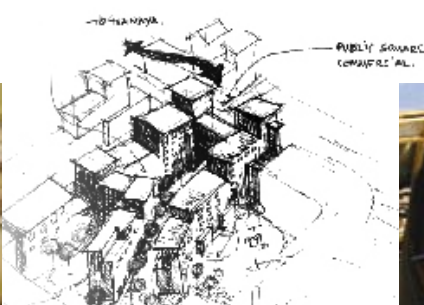
A new zozo building system

It is hoped that Open Building principles can be adapted using local techniques. The system at a specific shack-builder's yard was analysed and modifications were proposed to improve the quality of the shelter. Using the same materials, it is proposed that panels be broken into smaller modules that are staggered to achieve more stability. They thus become easier to transport and to use for alternative combinations that may offer more variety.

Current entrepreneurial initiatives of the shack-builder's yards are assessed and a strategy for convincing existing yards to adopt the new system was devised. The new shelters maintain the benefits of existing zozos by being easily transportable, re-sellable, extendable and adaptable. The proposed system may immediately ensure a better quality shelter that also has greater potential to be upgraded into a more permanent house.

The issue of informality

Many people in Mamelodi live in shacks, in areas occupied through illegal land invasions, on legal plots waiting for government houses or in backyard shacks. Backyard shacks on legal plots provide rental accommodation for many and are a source of income for informal landlords. Construction yards provide squatters with prefabricated walls that can be assembled





in standardised sizes for shelters. When a house is bought, the walls and roof are transported to the plot. There, it is assembled and the floor is finished with a sand/cement mix. A simple corrugated sheeting roof is nailed onto the timber frame and the gaps are filled with a plaster mix. These flimsy shacks are built with slight variations, depending on the construction yard and the availability of materials.

Out of context: targeting a wider client base

Having looked at the materials in use at the zozo yards, one group of students investigated building furniture and partitioning systems to target a wider, perhaps higher-income group outside of Mamelodi. A flourishing market for garden furniture and shelters for the wealthier residents of peripheral areas already exists and it makes sense for yard owners to access this market.

In this project, pieces of furniture that could be made from readily available materials at the informal construction yards, was submitted for a student competition in South Africa entitled *The Legacy of Tectonics in Architecture*. Here the notion of tectonics as a constructional craft is being encouraged. The competition called for a need to be identified in a community and a solution to emerge from the available resources of the locale.

Papercrete insulation for zozo panels

This project investigated the use of papercrete (a mix of 60% paper-water slurry, 30% sand and 10% cement) as an

insulation material applied to the zozo panels. The papercrete panels may be drilled, glued, sawed or sanded and can be used in various ways. The intention is to establish a low-cost, high-volume mixer at the builder's yard and to experiment with various applications. The material is lightweight and strong with good fire-resistance qualities. The material may be used as a plastered interior finish and will increase thermal comfort of small homes. It encourages paper recycling and could create job opportunities in the community.

A multi-purpose "wall"

This project was submitted for the Des Baker Competition and won first prize. A group of students proposed building a multi-purpose wall in Nellmapius. The intention was to show the possibilities of locally sourced materials and simple construction techniques to create a wall with many uses.

A wall as a support structure may be used for seating, storage, planting, partitioning and as a children's play area. Certain functions and levels of intervention in the neighbourhood can be manipulated, including support and infill, furniture and partitioning, controlled and adjusted by various agents. → see p.31

Mural in collaboration with Solomon Mahlangu Arts Centre, 20 Shabangu Street, Mamelodi

This mural was implemented in December 2006 by two local artists and a student

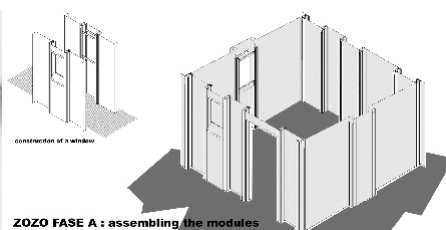
assistant on a main road at the entrance to Mamelodi. It serves to announce the project and our partnership with existing enterprises in the area. Our collaborators were Obed, an artist who lives in a shack at the back of a local church, and Jowi Matlala, also an artist who is very interested in the heritage of the area. Obed Mahlangu is trying to establish himself as a graphic designer and we hope to support him in that process.

Furniture project in collaboration with Sam the carpenter and owner of the Rasta Kitchen on Tsamaya Road

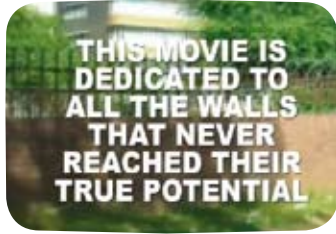
Sam's Rasta Kitchen is located opposite the Community Office on the corner of Hinterland Road and Tsamaya Road. This shack was built by Sam Mpila himself in a distinctive and interesting style as is his home. Sam makes furniture out of scrap materials. The project is supporting to develop his business further and we have appointed a group of students to work with him in 2007 and to formalise his restaurant, kitchen, furniture-making and building activities and, as yet informal, businesses.

Prominent art project by Motshili wa Nthodi

This well-known and well-travelled artist works from his home on Block O 4882 in Mamelodi. He has been identified as an excellent mentor to young artists in the area. An art project is being discussed with him for implementation in 2007 where he



→ 1 Exerpts from video submission for *The Wall*.



may also pass on his knowledge of materials and techniques to students from the University of Pretoria.

Felicia's House in Nellmapius

Felicia takes in orphaned children from the area. A donation has been made from The Netherlands to go towards the extension of her house to better accommodate all the children that live there. This project will be used to showcase how a typical township site may be densified using readily available material and local labour. The intention is to initiate this project during the course of 2007. 🗨️

Acknowledgements

The contributions of the following students are acknowledged: Nele Peeters and Margaritte Lubbe as well as the 3rd year Architecture design class of 2006 with special reference to Morné Lowe, Riaan Kotze, Adriaan Wooding, Carina Maree, Marco Freeks, Lizelle Cloete, Donovan Gottsman, Matthew Bosch, Justus van der Hoven and Michelle Greyling. The inputs of the Housing Elective group of 2006 and the new group of students involved in 2007 and their ongoing work are also acknowledged.

References

Babbie, E. & Mouton, J. 1998. *The practice of social research*. Oxford: Oxford University Press 1998.

Boyersky, N. 1998. *Action research: architecture and urbanism 1*. Black Dog Publishing Ltd.

Coghlan, D. & Brannick, T. 2005. *Doing action research in your own organization*. London: Sage publications.

Cohen, L., Manion, L. & Morrison, K. 2000. *Research methods in education*. 5th ed. London: Routledge Falmer Press.

Dewar, D. & Uytendogaardt, H. 1991. *South African cities: a manifesto for change*. Cape Town: Urban Problems Research Unit, University of Cape Town.

Dewar, D. 1998. *Settlements, change and planning in South Africa since 1994*. In: *blank_ Architecture, apartheid and after*. Edited by Hilton Judin and Ivan Vladislavi. Cape Town: David Philip Publishers & Rotterdam: NAI Publishers.

Greenwood, D. J. 1993. *Participatory action research as a process and as a goal*. New York: The Tavistock Institute.

Habraken, J. 1998. *The structure of the ordinary form and control in the built environment*. Massachusetts: MIT Press.

Hamdi, N. 2004. *Small change, about the art of practice and the limits of planning in cities*. London: Earthscan.

Jones, C. 1976. *Design methodology: seeds of the future*. John Wiley & Sons Ltd.

Kendall, S. 2003. *Making accommodating residential form: international developments towards open residential architecture*. *Proceedings of World Congress on Housing, Housing Process and Product*, Montreal, 2003.

Mosey, D. 1998. *Design and build in action*. Oxford: Chandos Publishing.

National Department of Housing, South Africa. 2004. *Briefing document: breaking new ground, a comprehensive plan for the development of sustainable human settlements*.

Osman, A. 2006. *Adaptable residential architecture in South Africa: exploring the possibilities of technological and cultural transfer in partnership with small-scale, local industries in Mamelodi, Pretoria*, *Adaptable2006, TU/e*. In: *Proceedings of the International Conference on Adaptable Building Structures*, Eindhoven, The Netherlands, 3-5 July 2006.

Osman, A. & Lemmer, C. 2002. *Architecture and housing: changing perceptions in the new South Africa. The case of Pretoria University in Housing construction, an interdisciplinary task*. In: *Proceedings of the XXX IAHS World Congress on Housing*, Vol. 1. Coimbra: IAHS.

Osman, A. & Karam, A. 2005. *Report on themes, issues and recommendations of the seminar as well as integration with the intentions of IBSA, AMCHUD and BNG*. In: *Proceedings of the International Housing Research Seminar, Cape Town, July 2005*. (Unpublished).

Osman, A. & Lemmer, C. 2005. *Open building principles: an academic exploration in Soshanguve, South Africa*. *Open House International*, Vol 30, No 1.

Osman, A. & Peeters, N. 2005. *Generating an improved quality of informal housing, Mamelodi, South Africa*. With Nele Peeters. In: *Proceedings of the CIB Conference and Meeting on Informal Settlements and Affordable Housing*, Surabaya, Indonesia, November, 2005.

Peeters, N. 2005. *Generating an improved quality of informal housing, a case study in South Africa*. Master's by research.

Peeters, N. & Osman, A. 2005. (Editors) *Generating an improved quality of informal housing in Mamelodi, South Africa*. Edited by De Villiers, A., Ural, O. & Osman, A. In: *Proceedings of the XXXIII World Congress on Housing, 2005, Congress Proceedings*. Pretoria: IAHS & UP.

Dr Amira Osman is a senior lecturer with the University of Pretoria's Department of Architecture.

amira.osman@up.ac.za

