Medium-Density Mixed Housing: sustainable design and construction of South African social housing

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INTRODUCTION
Medium-Density Mixed Housing (MDMH), of which social housing (SH) is one component, is perceived to have the capacity to contribute to the transformation of fragmented South African cities more than the massive roll-out of government-subsidised "one-house-per-plan" typology. It is also perceived that higher densities are more economically and environmentally sustainable. If these perceptions lead to large numbers of MDMH projects being built in the near future, the projects will have a significant impact environmentally and economically.

MDMH is defined as housing that has a minimum of 50 dwelling units per hectare (du/ha) and a maximum of 125 du/ha. These densities have different spatial and physical manifestations. MDMH is generally characterised by ground-level entry, private external space for each dwelling unit, close proximity to parking – thus these developments are rarely over three to four levels high. Social housing (SH) is defined as medium-to high-density housing with different tenure options but excluding immediate ownership. SH is developed and managed by accredited institutions and receives government subsidy. It caters for the R1 500 to R7 500 monthly income bracket. While it is an important level entry, private external space for each dwelling unit, close proximity to

BRICKFIELDS AND CARR GARDENS

The model to analyse MDMH developments was developed by the CSIR (Lindeman et al., 2007 and Du Toit and Landman, 2007). As an example, two projects were compared: Brickfields and Carr Gardens.

The ability to adapt buildings is, for the largest part, determined by two parameters: whether or not the construction can be disassembled and reconstructed or reused; and the amount of effort that is needed to do this. Therefore, the most crucial aspect of "Design for Disassembly" (DfD) is the detailing of connections between a building’s different components. DfD means designing buildings that can be disassembled and reassembled part per part (Surnam et al., 2006). It assumes that connections can be undone. "Design for Competibility" (DC), on the other hand, ensures that elements can be connected to each other, because their measurements are all based on the same sequence.

CAPACITY FOR CHANGE AS A REQUIREMENT FOR SOCIAL HOUSING

There is an assumption that rental housing, seeing cycles of owners over its lifetime, might not have to be adaptable. The argument is that the users are not the owners and will only inhabit the units temporarily. However, it is argued that change is important for new tenants, old tenants and for the institution that owns and manages the residential properties. This makes the building stock more visible in the long run, more able to adapt to changes in market demand and allows easier maintenance by disentangling building systems and components.

TWO-BASED ARCHITECTURE: CONCEPTS OF PARTICIPATION, CHOICE, VARIETY AND CHANGE

The tools used in the study did acknowledge that there needed to be a mix of unit types, finishes and sizes, it did not assess the potential of the buildings to adapt to future needs and market demand.

Time-based Architecture (TBA) or 4-Dimensional Design (4D-design)... refers to a design strategy to constantly change the design as it is constructed. This is done by integrating the fourth dimension, i.e. time, in the initial design phase. Open building practices are based on this principle. This means that the buildings are designed and built to allow for change either by the original contractor or by future users.

Some of the key findings of the CSIR MDMH project (2007-09) project are listed below:

1. MDMH may offer more opportunities with regards to de-concentrating poverty, offering an environment for change and variety.

2. MDMH housing has the potential to add to the viability of a project by becoming stigmatised, thus the call for an approach to design that may offer opportunities for change and variety.

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5. There is a willingness from investors to spend on developments that have a mix of tenure options and income groups. This is seen as a financially sustainable path towards development.

6. It was also found that it is possible to use subsidies to achieve medium densities.

In addition, it was also attempted to objectively describe and rate the characteristics of the residential built environment in an urban setting. A tool was developed that facilitates a qualitative and quantitative (mixed) approach to assessment. This may allow for better informed decision-making based on empirical research. By assessing proposals for new developments, the gap between policy-makers, designers, developers and end-users could be closed.

BRICKFIELDS AND CARR GARDENS

The model to analyse MDMH developments was developed by the CSIR (Lindeman et al., 2007 and Du Toit and Landman, 2007). As an example, two projects were analysed using this model: Brickfields and Carr Gardens. Brickfields and Carr Gardens are both SH projects located in Johannesburg. These subsidised rental developments have a number of shared characteristics and the comparisons between them are presented in the images to better explain the tools used in the study.

Comparing the "scores" of the spatial principles in Brickfields and Carr Gardens

The two additional aspects are considered to be important when implementing the above-mentioned assessment methods: the determination of priority and the addition of potential user benefit. A possible method of attributing priority to parts of a construction is shown in Nordby et al. (2006: p. 7).

Comparing the spatial performance of Brickfields, per principle

Prioritising has three advantages – firstly, it helps in prioritising the parts of a construction that result in the highest cost-benefit when conceived as adaptable structures. The second advantage is that prioritising could help to keep the assessment process manageable, thus preventing the different components or structures based on their unique characteristics. When a component has a high priority or rank, generally, it could be assessed using a separate method. This keeps the existing tool more streamlined and easy to use. Last but certainly not least, priority could be used to determine the weighting factor of the performance standards used in the assessment. This way, the weighting of adaptability specifications would be determined by building type and specific requirements. The impact of adaptable architecture on the user of a building could also be introduced to further influence the weighting of the performance standards.

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The determination of priority and potential user benefit

REFERENCES


• BRICKFIELDS: Importance of Brickfields

• Carr Gardens: Importance of Carr Gardens

• Comparing the spatial performance of Carr Gardens, per principle

• Comparing the spatial performance of Brickfields, per principle

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