FOCUS

ANOTHER LOOK AT LOW-COST HOUSING

The provision of adequate shelter for the world's ever-increasing population enjoys a high priority on the agenda of most governments, particularly those of developing countries. The International Labour Office points out in a recent publication that investing in shelter creates jobs, improves productivity and raises income. Increased shelter development activities trigger additional investments in building materials production, transport and marketing. These in turn generate demand in other sectors. Any investment in housing or infrastructure can thus have a multiplier effect that extends beyond the housing sector.

Poor households have limited means at their disposal to access housing that provides adequate protection against the elements, as well as potable water, adequate sanitary facilities (including waste disposal) and a domestic electricity supply. As a consequence the state is called upon to assist such households in their endeavours to access housing. The state, in turn, faces budgetary constraints.

Any housing policy and strategy accordingly needs to serve all segments of the market in a way that maximises the options available to households that have limited initial means. Such strategies should enable the poor to enhance and strengthen their own efforts and initiatives to improve their housing situation over time and enable government to address backlogs in housing within budgetary contracts.

This approach to housing will enable people to have access to adequate permanent residential structures on a progressive and incremental basis. At the same time, such an approach enables sustainable and affordable levels of service to be provided while ensuring acceptable and adequate functionality.

The main thrust of an incremental approach to housing should be to enable choices to be made from a range of technical options in order to meet the needs of a household or community at a particular time within its means.

Approach advocated in the White Paper

The White Paper (A New Housing Strategy for South Africa) asserts that 'households access housing at a level commensurate with the means at their disposal at the time and thereafter continuously strive to improve their circumstances with whatever means comes at their disposal. The more limited the ability of a household to be self sufficient, the more the responsibility on the State to support the endeavours of such a household to house themselves.'

This paper adds that 'the South African context requires an approach of assistance to households in need in a way that will maximise the options available to enhance and strengthen their own efforts and initiatives to improve their housing situation as quickly as possible'.

Approach to services provided in the New Red Book

The New Red Book (Guidelines for Human Settlement Planning and Design) provides performance-based guidelines for informed decision making. It stresses that a common strategy is required so that the development process is geared towards meeting the particular needs of communities in a manner that is acceptable to them and not merely acceptable to the planner, designer, financier or local authority.

The philosophy and approach to the provision of services to poorer households embodied in the Red Book can be seen in its approach to water and sanitation. Its point of departure in sanitation is 'that the basic facility should be a Ventilated Improved Pit (VIP) toilet or equal'. It then puts forward five main criteria to be considered when providing a sanitation system for a community: reliability, acceptability, appropriateness, affordability and sustainability. It also develops a matrix of options which provide for no addition of water / addition of water and requiring conveyance (treatment at central works) / no conveyancing (treatment or partial treatment on site). It then discusses the technicalities of the various systems and provides guidance on the choice of sanitation system. Information is also provided as to how such systems can be upgraded.

A range of options is likewise provided for water supply based on type of supply, relative capital cost of supply scheme, cost recovery, maintenance needs and unit costs. Technical guidelines and factors to be considered when selecting an option are also provided.

An approach to superstructures

The National Building Regulations in South Africa set the functional requirements for all buildings. It is relatively easy to describe these requirements, but it is difficult to formulate deemed-to-satisfy requirements. Current deemed-to-satisfy provisions as embodied in SABS 0400 (the application of the National Building Regulations) have been framed around 'First' World parameters, namely low maintenance, no penetration of water into interiors, deflections which are not discernible, negligible levels of cracking, etc, all of which are embodied in international/national codes of practice found in developed countries. No differentiation is made in approach between commercial and residential structures.

As a result, structures in developing countries, including South Africa, fall into one of two categories:

- formal structures which are constructed in accordance with National Building Regulations
- informal structures for which no standards apply

From a health and safety point of view this situation is clearly unacceptable. However, if different user performance levels are defined, it could be possible to regulate the construction of houses that have comparable safety standards but have different resistances to rain penetration, deflection limits, maintenance requirements, etc. As in the case of services, end users would then choose the housing solution that is within their means without compromising safety and basic health requirements.

Towards user performance levels for superstructures

Two user performance levels are proposed, the basic characteristics of which are set out in table 1:

Table 1 Proposed user performance levels for superstructures

User performance level	Basic characteristics
1	• The focus is on producing basic shelter at the lowest possible initial cost recognising that shorter maintenance cycles than those contemplated in user performance level 2 may be required • Mortgage lending finance is not involved; short-term loan finance may be involved* • Limited rain penetration through walls and roofs is permitted in abnormal storms
2	• The focus is on producing a durable housing unit that requires infrequent maintenance • Mortgage lending finance is usually involved

* Housing units may be constructed in terms of self-help / sweat equity schemes.

User performance level 1 housing units will in general have no basements, be of single detached storey construction, have a floor area of less than 100 m², have a maximum length between intersecting walls or members providing lateral support of 6,0 m, and have external doors located in such a way that an occupant does not have to move through more than one room to reach an external door.

Typically, user performance level 1 would apply to housing constructed in terms of the housing subsidy scheme and micro-lending schemes and user performance level 2 to mortgage lending housing. The lower end of Mantag houses could be regarded as being user performance level 1 and Agrément housing as user performance level 2.

Constraints to innovation

Innovation in the low-cost housing sector is frequently constrained by some or all of the following:

- the lack of availability of technical information to enable informed design decisions to be made
- the lack of suitable on-site acceptance tests
- the reluctance of authorities to accept structures whose strength, stability, serviceability and durability cannot be quantified and assessed in terms of national or international codes of practice
- the reluctance of clients to pay for research and development

Clearly, the individual engineer does not have the necessary resources to overcome these difficulties. Furthermore, the engineer who must assume responsibility for the safety of the structure is naturally reluctant to place himself at risk by deviating from accepted norms in the absence of authoritative documentation and codes of practice.

Developed countries have concentrated on developing codes of practice based on the conventional materials such as concrete, masonry, steel and timber for use in user performance level 2 applications. Even where grant funding is provided to research innovative technologies, there is no guarantee, for various reasons, that the research will be used in practice. Frequently the deliverable in research projects is a set of guidelines that provides valuable insights into the subject matter. These guidelines, however, rarely satisfy building authority requirements, or public body needs, and seldom do they enable designers to execute designs with satisfactory levels of confidence. All too often the research is structured to provide indicative as opposed to quantitative results. For example, engineering properties are established on a non-statistical basis and serviceability aspects such as resistance to rain penetration are ignored. Even when aspects relating to strength, stability, durability and serviceability are satisfactorily dealt with, such documents rarely enjoy widespread usage.

Proposed code of practice

What is clearly required is a code of practice for housing that sets functional requirements and provides a framework for deemed-to-satisfy ways of meeting these functional requirements. The Joint Structural Division of SAICE/ IstructE has recognised the need for such a code and is currently drafting a code of practice for the Structural and Serviceability Assessment Criteria for Housing Units in South Africa that covers the topics listed in table 2:

Table 2 Topics in code of practice for housing

Requirement	Topic	Topics dealt with by code
Safety	Structural	•
	Fire	•
	Accidents	•
	Site	•
Habitability	Structural serviceability	• (water only)
	Thermal comfort	
	Tightness (air and water)	•
	Air quality	
	Acoustic	
	Lighting	
	Other (accessibility, functionality, security, adaptability, health and hygiene, aesthetics, etc)	
Sustainability	Durability	
	Maintainability	•
	Economy	• (limited)
	Decommission	• (partially)
	Environmental friendliness	

This code of practice recognises that poor households have limited means at their disposal to access housing that provides adequate protection against the elements. It suggests that such households should be permitted to access housing at a level commensurate with the means at their disposal at the time and thereafter be able to continuously strive to improve their circumstances with whatever means comes to their disposal. In response to this identified need this code of practice develops two user performance levels (see table 1) to enable choices and economies to be effected in the provision of housing to poorer households.

The code seeks to establish requirements for housing units, to define user performance levels, to set technical performance levels for the two user performance levels, and to provide methods and means by which requirements for given performance levels can be satisfied. As such the code will provide a standard against which non-standard forms of construction can be evaluated and deemed-to-satisfy design and construction rules can be formulated.

It is anticipated that this code of practice will enable innovators in the construction industry to develop products around these requirements for specific climatic zones in the knowledge that their building systems will be accepted should they satisfy the functional requirements. The code will also facilitate greater use of local materials.

Conclusion

The adoption of the two user levels of performance advocated above will enable choices and economies to be effected in the provision of housing to poorer households. It will also align the provision of superstructures with the approach that is currently being pursued in the provision of services. The two levels of performance can also be linked to different sources of funding and can enable the National Home Builders Registration Council to manage risk in two distinctly different markets, namely houses above R20 000 and subsidy housing.

The code of practice which is currently by developed by the JSD is expected to bridge the gap between formal and informal housing as it will enable the design and construction of the full spectrum of permanent homes to be regulated.

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