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Special edition on materials for affordable housing and infrastructure

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The construction industry places an ever-increasing burden on the sustainability of the world. It not only accounts for almost 20% of the total global freshwater consumption but as well consumes, directly or indirectly, up to 40% of the total global energy. At the same time, the industry generates between 20% and 30% of the total waste, and this figure increases considerably once demolition waste is included. It is a difficult task still to enforce international agreements on reducing the CO_2 emissions, banishing toxic pollution materials or minimising high energy embodied materials.

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However, newly developed alternatives could be presented to do away with problems such as different types of wastes, use of locally available material, etc., and suggest applications of appropriate techniques for adequate buildings, both in industrialised and developing countries. Earth as a construction material, vegetable fibres and cements from industrial or agricultural residues are well known already and should be employed more intensely in regional solutions or specific installation. Low cost, energy efficient, waste reduction, thermal comfort could be listed as advantages. Even in industrialised countries, where it becomes more and more expensive to get rid of demolition debris, for example, this appeases the conscience of the population, as well as its purse.

We are pleased to present in this special edition of the Journal of Materials Science selected papers reporting about the ongoing research efforts in the field of materials for affordable housing and infrastructure in research institutes from four continents: Africa, South and North America, Asia and Europe. The papers were presented during the: ''1st Africa Materials Research Society Meeting'' in Dakar, Senegal in December 2002, ''1st Inter American Conference on Non-Conventional Materials and Technologies in the Eco-Construction and Infrastructure'' (IAC-NOCMAT 2003 JP), in João Pessoa, Brazil in November 2003; and as Keynote Lectures at the ''Brasil-NOCMAT 2004 Conference'' in Pirassununga, Brazil, in October/November 2004.

The main topics of interest are:

- affordable housing concepts and prototypes (cost effectiveness);

- environmentally friendly, energy efficient and culture-based designs (holistic approach);
- recycling of industrial and rural residues;
- use of alternative materials in innovative construction;
- durability and ageing mechanisms;
- lifespan of construction materials under weathering conditions in tropical areas;
- evaluation of material performance by the use of adequate testing techniques.

We hope that this special issue will provide the readers with new insights that could lead to the development of materials for affordable housing and infrastructure. The success of this initiative has relied on the patience and cooperative effort of the authors and reviewers during the extensive peer-review period. We are grateful to governmental agencies in Brazil (Co-ordination for the Improvement of Higher Education Personnel—Capes, National Council for Scientific and Technological Development—CNPq, The State of São Paulo Research Foundation—Fapesp and The State Foundation of Rio de Janeiro—Faperj) and in USA (National Science Foundation—NSF) for their support to the scientific events that originated the initial versions of several contributions joined in this present issue.