Editorial

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Biographical notes: Ravi Jain, PhD, PE, Associate Editor, is Dean of the School of Engineering and Computer Science at the University of the Pacific in Stockton, California. Prior to this appointment, he has held research, faculty, and administrative positions at the University of Illinois (Urbana-Champaign), Massachusetts Institute of Technology (MIT) and the University of Cincinnati. He has directed major research programmes for the US Department of Defense and has worked in industry and for the California State Department of Water Resources. He has been a Littauer Fellow at Harvard University and a Fellow of Churchill College, Cambridge University. He has published 13 books, over 150 scholarly papers and technical reports, and has received national recognition for his teaching and scholarly activities.

Building deconstruction and reuse technology is important for a number of reasons: construction demolition waste represents nearly 30% of landfill material; many commercial buildings, houses, and military facilities in the USA are demolished each year. Since timber is used extensively in these buildings, it is one of the most salvageable and reusable materials. In the USA, timber production uses more acreage than agriculture. Consequently, reusing material from construction demolition reduces the amount of land that has to be devoted to production of timber. Recent studies in the USA indicate that nearly 75% of construction demolition waste can be reused economically (US Environmental Protection Agency, 1998, 2002; US Green Building Council, 2001).

Considerable new ideas and knowledge related to building deconstruction and reuse technology are being developed. This special issue of the journal provides original papers covering some of the crucial topics related to environmental technology management and economics of building deconstruction and reuse.

A comprehensive review of *building deconstruction and salvage: deconstruction benefits and hurdles* is presented by Professor Shami. The paper states that nearly 65 million tons of waste is produced in the USA every year from construction and demolition. From this waste, almost 45% can economically be diverted and partially converted into reusable materials. Several socioeconomic issues relevant to deconstruction (a systematic and planned disassembly of building materials with the goal of maximising reuse and recycling) are addressed in this paper. One of the most important issues is the supply and demand of used building materials in the market and

training of labour for handling these materials and managing the supply chain. There is also an important linkage between deconstruction and so-called "green construction" and this is also described here. This comprehensive paper provides information about some deconstruction initiatives and case studies from around the world, including the USA. An objective overview of technical, environmental, and socioeconomic issues related to deconstruction and material reuse is also provided.

The paper by Brad Guy and Timothy Williams describes a *certification process as a means to validate "sustainable" building removal* by a government agency or a building owner. They propose that this process can be used for several purposes: issuing a deconstruction permit, meeting waste diversion goals or for providing incentives for green demolition practices. This approach along with market incentives can further enhance usage of deconstruction and reuse technologies.

The reuse and recycle of building materials is a growing area of interest and concern in many parts of the USA, and surely, of similar concern in other parts of the world as well. In the paper 'Strategies for building material reuse and recycle', Roper describes current practices and trends in the building material waste management area from a building life cycle standpoint. The paper includes strategies related to: zero waste, integrated recycling, international approaches, reuse of materials, resource optimisation, waste reduction, and deconstruction. Examination of the waste management hierarchy and life cycle management of material are used to improve the understanding of reuse and recycle opportunities. Four case studies are also presented to illustrate the benefits that can be derived from effective building material reuse and recycling.

Siddiqi and Thomas in their paper 'Benchmarking adaptive reuse: a case study of Georgia' assert that holistic construction approaches are needed to move from Leadership in Energy and Environmental Design (LEED) certified new buildings to adaptive reuse of existing buildings. Adaptive reuse, in the opinion of the authors, is an opportunity to recycle and manage the deconstruction process in a more responsible manner with focus towards the new occupancy requirements. The paper presents three case studies where adaptive reuse was applied to existing buildings.

Waste tire recycling is an example of generic material recycling that stands out as a dramatic case of environmental benefits by reducing the waste stream for a product unwelcome at disposal sites. In the paper 'Waste tire recycling: environmental benefits and commercial challenges', authors describe how tires consume a large volume of limited landfill space, trap methane gas, and create other environmental problems. Public agencies seek enhanced environmental resources, yet may well need to contribute or otherwise influence the tire recycling industry. In the case study presented, waste tire recycling is examined in terms of material flows and paths, commercial actors and government involvement and the ability of the recycling industry to reduce the waste stream with net positive environmental and economic benefits.

In the paper 'Deconstruction of structures: an overview of economic issues', Munroe, Hatamiya and Westwind assert that the demolition of buildings produces enormous amounts of waste material. While environmentalists have been promoting reuse and recycling for many years, most contractors and developers have to rely on business profitability considerations when making these decisions. Not surprisingly contractors have favoured demolition over deconstruction and reuse. This decision stems from the fact that demolition is fast and less labour intensive; also there is always an inexpensive nearby landfill option available. Slowly but surely, the balance is shifting. An increasing number of well-documented public as well as non-profit sector deconstruction projects

indicate that reusing building material can be economically and technically viable. Lessons of these projects described in the paper as well as public policies aimed at providing appropriate incentives can help in the maturation of a market-based deconstruction industry as a part of the larger construction industry cluster.

The paper by Brad Guy specifically focuses on *pollution prevention through the optimisation of building deconstruction for the US Department of Defense facilities*. The project is described in considerable detail and the paper focuses on the World War II era two-storey wood framed barrack buildings in the USA. Issues dealing with hand labour versus mechanical devices used for deconstruction and the quality of the material that is salvaged are described. Often, this level of detail has to be developed for typical deconstruction projects before a decision can be made regarding the level and the approach utilised for building material deconstruction and reuse.

Related to building deconstruction and reuse technology are issues regarding *renewable energy production*. A very interesting case is the proposed development that would supply up to 95% of Cape Cod energy needs using wind turbines. Even one of the most eco-friendly states in the USA, Massachusetts, has produced much opposition to this project. Roper provided the details of this project in his paper 'Renewable energy production issues with the Cape Cod offshore wind energy programme'. Criticism of this project ranges from anticipated bird kills by the turbines to the concerns about the visual pollution that these wind turbines may present in a scenic Cape Cod seascape. While economically feasible and environmentally friendly, this points to other social, visual, and environmental considerations that are not normally anticipated with such projects. This, clearly, is often the case for implementing renewable energy, pollution prevention and reuse technologies.

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