Eco-costing of construction waste

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Abstract

Purpose – The purpose of this paper is to provide an analysis of the key issues to be addressed in developing a framework for the eco-costing of construction waste.

Design/methodology/approach – Based on an analysis of the literature, original thinking and the use of a case study, the key issues to be included in an eco-costing framework in the construction industry are discussed.

Findings – The relationship between process, policy, technology, impact and cost is discussed. The relationship between environmental cost and construction site activities is introduced. A mathematical model for eco-costing wastes from construction site activities is also presented.

Originality/value – This paper provides a first attempt to conceptualise eco-costing issues in relation to waste from building site activities, and also provides practical modelling for implementing an integrated strategy for the eco-costing of construction waste.

Keywords Ecology, Costs, Environmental management, Building sites, Sustainable development, Waste management

Paper type Research paper

Introduction

Sustainable waste management encourages the generation of less waste, and the reuse, recycling and recovery of waste. Waste is defined as any losses produced by activities that generate direct or indirect costs but do not add any value to the product from the point of view of the client (Formoso et al., 1999). Symonds Group Ltd, ARGUS, COWI and PRC Bouwcentrum (1999) define waste as any substance or object which the holder intends or is required to discard. Koskela (1992), Alarcon (1993), Serpell et al. (1995) and Ishiwata (1997) define construction waste in relation to time delays, quality costs, lack of safety, rework, unnecessary transportation trips, long distances, improper choice of management, methods or equipment and poor constructability. Alwi et al. (2003) simplified and divided these into three main categories:

(1) labour;
(2) material; and
(3) machinery waste.

Several studies have been conducted to determine the waste rates for construction materials on site. According to Pinto and Agopayan (1994), experimental studies pointed out that the waste rate in the Brazilian construction industry is as high as 20-30 per cent of the weight of total materials on site. Hamassaki and Neto (1994) stated that 25 per cent of construction materials are wasted during construction operations. Formoso et al. (1993) estimated the amount of construction waste generated to be as much as 20 per cent of all materials delivered to site. Fishbein (1998) reported that construction site waste is estimated to be as much as 30 per cent of the weight of total...