Causes, effects and remedies of buildings' construction wastes in Oman

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Abstract

Growth in population, improvement in living standards, continuous urban expansion, and endless increment in construction activities led to construction waste (CW) escalation and problems all around the world. The construction industry is considered as a major source of solid wastes generator. Construction wastes (CW) pose negative impacts to both cost/time of the project and the environment. Depletion of natural resources, illegal dumping of CW and expansion areas of landfills are direct impacts to the environment.

This study was focused on the wastage of construction materials in buildings’ projects in Oman. It identified major causes and effects of construction wastes as well as suggested remedial actions for controlling and managing CW. The data collection was carried out by literature review and field survey including questionnaire, case studies and interviews.

The results revealed 4 major causes of CW having RII values higher than 70% including: (1) poor awareness about construction material waste among the public, (2) most of companies do not have a well-defined material management policy or a systematic control of material usage, (3) most of material waste is caused by inappropriate training or shortage of skilled workers, and (4) in most cases, building projects consumes material more than the quantities estimated in the Bill of Quantity.

The results identified 5 major effects of CW with RII values more than 70%, these are: (1) construction wastes increase environmental pollution issues, (2) repetition of abortive jobs reduces the morale and affects the quality of work, (3) construction wastes cause depletion of resources and cost escalation, (4) construction waste causes illegal damping of landfills, and (5) construction waste causes more than 5% increase in the project cost.

The results of this research suggests 8 technical remedial actions for CW having RII values above 80%; these are: (1) shop drawings should be carefully reviewed before execution, (2) consequences on cost, time and quality of change orders should be carefully studied before ordering, (3) workers should be trained to work effectively with good working culture and must be responsible about their duties, (4) cost effective recycling factories should be established for common construction waste material, (5) timely and effective communication of variation orders to all parties concerned can minimize waste generation, (6) there should be an effective and enough supervision to monitor workers during their works at the construction site, (7) carryout design checks before constructions, and (8) increase motivation of workers by monetarily and non-monetarily methods.

In addition, 2 administrative actions are suggested to improve the construction waste management (CWM) system in Oman, these are (1) increase public awareness about CW issues, (2) establish and enforce unified legislations/regulations for CW minimizing and managing system.