

A Survey on Situation of Construction and Demolition Waste in Malaysia

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1. Introduction

Principal in driving Malaysia's transformation into a developed country, the construction industry has become the major consumer of new material in the market. Likewise, the construction industry is also a major solid waste contributor in Malaysia, the extent and nature of which is not well known. Construction and demolition (C&D) waste is generated throughout the development cycle, from demolition, site clearance, to building construction (Foo, Rahman et al. 2013). The construction industry in Malaysia is still very much dependent upon unskilled foreign labor, often practicing a low technology, conventional wasteful construction method (Begum, Siwar et al. 2009). Diverting C&D materials from landfills is important because it saves natural resources, decreases greenhouse gas emissions, reduces the need for landfill space, and saves money (USEPA 2003). This study focuses on investigating the current situation of construction and demolition waste in high-rise mixed-used developments in Iskandar Malaysia IM, southern Malaysia, which was established in 2006 as second most important economic conurbation in Malaysia.

2. Methodology

Five construction sites around Malaysia have been selected for pilot survey. The methodology used in this research for estimating the amount of C&D waste with interview, questionnaires survey and on-site observation. Interviews were conducted together with site supervisor, construction manager, and project manager or safety officer. Review secondary data such as monthly report and project tender document Bill of Quantity (BoQ) reveal that C&D waste are generated throughout five construction stages; earthwork, sub-structure, superstructure, building internal work, and external work

3. Current Situation of Construction and Demolition Waste in Malaysia

The residential development method is still focusing on conventional construction method with labor intensive. The construction waste generation rate varied depending on the skill of the labor, material cost, site management, tender and contract clause, building design and developer commitment in achieving higher quality product. Waste management on site depends on type of contract and the cost of the material. During the early project tender stage, contractor will usually price in about five percent of wastage as a lump sum in the total tender price. The material waste cost has already been captured and expected during the tender stage; thus contractor will have flexibility in managing its own cost-profit in handling the waste material whether to recycle or to dump.

Malaysia construction industry is lacking of awareness of recycling waste. Dumping is seen to be easiest and most efficient way to manage waste. The current practice on-site is to dump everything except reselling just scrap metal which values approximately about RM 500 – RM 1000 (USD 138 – 278) per ton. Waste generated on site manages by waste sub-contractor charging an average of RM 450 (~ USD 125) per truckload for dumping. Sub-contractor will then transport waste either to illegal dump site, to landfill, or some re-useable items (plywood, timber, and paper) will be resell.

Keywords: Construction waste, demolition waste, quantification, waste composition, estimation waste

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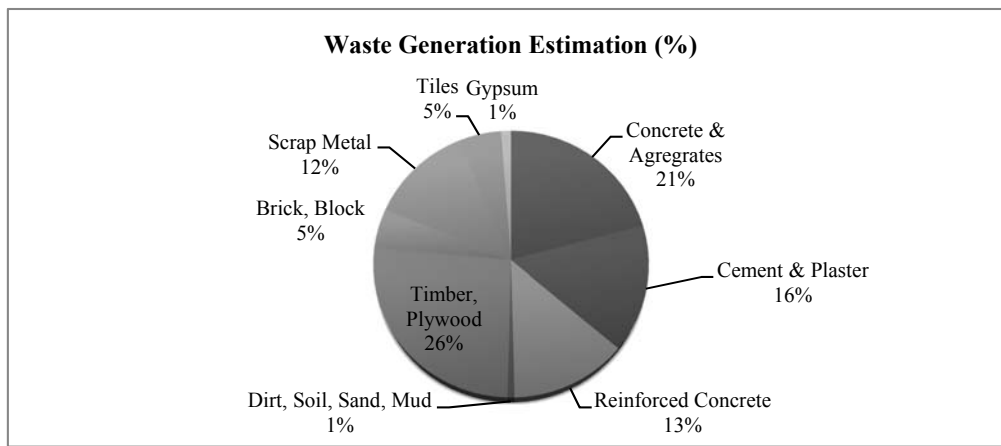


Figure 1: Average percentage of waste estimation

Outcome from the survey shows that timber and plywood generated highest waste estimated at about 26% and average 0.0881% per 100m², both of these material are expected to be on the high side as conventional method relied on it to construct temporary formwork during sub-structure and superstructure stages. Concrete and aggregates are estimated about 21% and 0.0585% per 100m². This is the main material used in sub-structure and super structure for beam and column casting. Cement and plaster contributed about 16% of waste and 0.0464% per 100m². This can be explained with the pumping technology that uses system pump to pump cement up to the higher level. Activating the pump averagely need about 5 packs of cement and those unused cement in the pipe will be wastage. Reinforced concrete is about 13% and 0.0387% per 100m² wastage in average. If the quantity of reinforced concrete that consists of rebar and concrete are in big amount, contractor will separate and salvage the rebar. If otherwise, dumping is deemed to be more feasible than salvage. Scrap metal is on average 12% and 0.0379% per 100m². This is the only material that they salvage and recycle. High generation rate in C&D waste shows the potential of future recycling.

4. Conclusion

In reality, only few projects that collect waste information; demolition and reconstruction projects where wastes are produced in mass quantity make it seem feasible for recovery, recycle and reuse. The variation in specific practices of the builders and different method in handling waste collection and storage explained the differences in the estimated percentages. The results from this study provides a baseline data for the C&D waste estimation and outlined a better understanding on type of material waste generated in construction industry in Malaysia.

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