

Waste management in the construction industry construction essay



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Management for the solid waste is one of the important parts of “Environmental Engineering or Management” in Construction Industry. As the construction industry worldwide is a conspicuous consumer of raw materials of many types and it does not have an enviable record in its attitude to managing the waste, it produced both during construction and as a result of the demolition of buildings. Although there are some demolition materials were recycled, such as doors and windows, or bricks, these components are limited that most of the construction waste has long been indiscriminately loaded into containers and taken to landfill with no attempt to salvage anything that might be of use. However, landfill is not a suitable long-term to handle the solid construction waste, as depleting the world’s natural resources, our pollution may be irreparably damaging its natural eco-system.

“ The practice of solid waste management is underpinned by a hierarchy of waste control measures (Peng et al., 1997).” This hierarchy, shown in Figure ##, means control measures are preferable to recycling rather than disposal the waste by incineration or land-filling. Recycling of solid waste means re-used the waste after that waste is re-processed. Therefore, the amount of solid waste of construction industry can be reduced by recycling.

To recycle the solid waste, the building materials and components is needed to be re-examined their life cycle by life cycle assessment, that is the framework within which a material or product is examined through its entire from raw material extraction, manufacture, construction, use, maintenance and disposal. As a result, the solid wastes were used to be handled in one direction that is using for landfill, but now some of the solid wastes can be used for another construction works, so that the waste can be reduced.

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Nevertheless, in order to achieve the goal, all participants in the construction process are needed to make the integrated effort. If someone is going to demolish a building and want to recycle the construction waste, there should be another construction project that is going to use the recycled material. Effective waste management therefore requires a collaborative effort through the construction supply chain in which the client, designer, materials manufacturers and suppliers, construction and demolition contractors and waste disposal contractors all have an important role to play.

Innovative design

As it is mentioned above that designer is one of the parties that need to help a construction project become more environments. To reduce construction waste, innovations in the design of buildings can provide a greater flexibility and permit refurbishment and fit-out as when needed to do so. Buildings can also be designed to facilitate de-construction. As it is the preferred method of demolition, the materials used can choose as some re-use materials.

Also, innovative design can have a significant impact on material wastage. For example, the roof of the Sydney Olympic Main Arana Grandstand was designed in such a way that it required 22% less steel.

Material Supply

To minimize promoting waste during construction, suppliers of the material also play an important role, as they can rationalize production by standardizing components and reducing packaging. Also, they can

participate with recycled content in the manufacture of products. Such as BHP, a leading Australian mining and resources company, manufactures 100% recycled steel products in its Sydney mini-mill which uses up to 300 000 tonnes of scrap steel each year. A better waste management can also be promoted by innovative supply arrangements. From some adopting practices like 'taking-back' surplus or recyclable materials (Environment Australia, 2000), it is reported that some producers of construction materials now are starting to take responsibility for the whole life cycle of their products. An example is showing that Interface Australia Pty Ltd has refocused its supply arrangements to achieve less wasteful practices. The company of supplying modular carpet tiles has adopted a system through which customers lease rather than buy the carpet. Customers pay a monthly fee, which includes warranty, design, manufacture, installation, maintenance and final reclamation of the product, for the value and use of the carpet supplied.

Construction

Construction Contractor can also reduce solid waste during construction, as their works may include waste management plans, good site management and organization. Accurate estimating and ordering with nil allowance for waste reduces the volume of waste, the cost of materials and the cost of waste disposal. On the construction site, it should be clearly separated and labeled the wastes which can recycle and cannot recycle. It is reported that through its waste minimization measures, Fletcher Construction reduced waste disposal costs by 55% and increased profits compared to another

project, of very similar design and construction, in which waste minimization measures were not implemented (McDonald, 1996).

In the construction industry, in the large proportion of the work is sub-contracted, ensuring supplier and sub-contractor compliance with waste management plans is crucial. On the Stadium Australia project, 7000 fire doors were delivered direct from the factory without packaging and sub-contracts required compliance with project waste management plans and specified that packaging materials had to be returned to the original suppliers (Commonwealth Department of the Environment and Heritage, 2000).

Demolition

The demolition process generates the greatest volumes of waste in Construction Industry, so a good planning can reduce waste very effectively. Deconstruction of the components of a building should be done very carefully and taken apart piece by piece since these materials can salvage and re-use. Salvage and re-use of building components requires a network through which materials and purchasers can be matched. There are reported to be very successful material/waste exchanges operating in the United States, e. g., Mason Brothers in Vermont, who use a barter system to trade used items from buildings and are reportedly making a profit (Witten, 1992). Mason Brothers do not specialize in historical treasures but also supply low-end' materials, such as US\$10 doors and chipped bathtubs. Another successful broker of salvaged items is Urban Ore in Berkeley, California. The company operates a 2. 2 acre (0. 89 ha) warehouse, employs 16 people and

reported expected gross sales of US\$1, 000, 000 in 1992 (Hazen and Sawyer PC, 1993). At present, such exchanges are in their infancy in Australia although some government agencies have created exchange web sites.

However, in some situation that salvage and re-use are not possible, due for instance to the use of composite materials, demolition waste can still be recycled. For example, during the demolition of the Balmain Power Station in Sydney, around 18 000 tonnes of concrete and brick and 2000 tonnes of steel were recycled (Commonwealth Department of the Environment and Heritage, 2000).

Waste disposal

In the waste management process, additional to the provision and emptying of skips, waste disposal contractors can also assist in through offering services. For a good practice illustrate, technological barriers to the management of solid construction waste are being overcome.

“ Construction waste has a high potential for recovery and re-use (Cospers et al., 1993; Schlauder and Brickner, 1993) and recycling options for solid construction waste are also increasing (Merry, 1990; von Stein and Savage, 1994).”

However, the extent to which recycling, re-use and reduction of solid construction waste can be achieved depends on motivational and attitudinal influences on the behaviour of participants at all levels of the construction process, from site operatives, to clients, managers, foremen, suppliers and designers; pressures to complete work quickly, for example, might lead a

tradesman to cut components from new material rather than spending time locating suitable previously cut pieces (Federle, 1993).

In the construction industry, Skoyles and Skoyles (1987) were the first to recognize that the problem of material wastage was more dependent upon the attitudes and behavioural tendencies of individuals involved in the construction process than upon the technical processes it employed. Since then other studies by Heino (1994), Soibelman et al. (1994), Guthrie and Mallett (1995), Lingard et al. (2000) and Teo (2000) have reinforced this view. Due to time and cost constraints, poor leadership and a lack of experience in dealing with environmental issues, their findings suggest that negative attitudes towards waste management prevail on construction projects. To the construction industry of making itself more sustainable, it would seem that the challenge is more fundamental than merely creating policies and systems to monitor work-practices. Rather, the problem is cultural and lies in changing people's attitudes to issues such as waste management.