

True Cost of Waste in Whole Life Costing

This report examines whole life costing (WLC) practice with the intention of identifying practices and conventions which can lead to the underestimation of the cost of waste in construction. A number of amendments to the WLC method have been proposed for areas where such practices have been identified.

The most important issues identified with the cost of waste in current WLC practice have been identified in the report and include:

- Net present value discounting – it is apparent that there is no real world rationale for discounting costs which occur over the real lifespan of a structure, such as waste disposal.
- Waste disposal inflation – the current method for calculating cost of waste disposal does not allow for any increase in cost (above inflation) with time.
- Design life (study period) – the building life expectancy adopted by convention is not representative of the actual lifespan of many buildings.
- Lack of cost of waste data (Capital and whole life costs).

The amendments to the WLC method have been proposed in order to highlight the true cost of waste are as follows:

Amendment No.1 – Waste cost inflation

It is proposed that the extra cost of waste disposal is allowed for in tables/graphs which allow for the increasing cost of waste with time. Due to the inherent uncertainty of predicting the future it is proposed that the user be given a choice in the selection of future cost profiles.

Amendment No.2 – Net present value discounting

It is suggested that the widespread use of this practice is examined, as present value discounting implies that waste production (along with other maintenance costs) in the future will have little or no current value. It would only be reasonable practice in (probably hypothetical) instances where a client establishes a dedicated fund for maintenance on commencement of the building operation.

Amendment No.3 – Design life and study period of 180 years

It is suggested that a design period of operation (and then demolition) of 180 years is realistic and better addresses the aspirations of clients and regulators than the current convention of adopting 60 years.

As part of the report, these amendments were applied to a real project study to investigate their effect.

When employed on the real project study the techniques for identifying the true cost of waste showed that the cost of waste arising from a building over a 180 year life span was similar to the total lifecycle maintenance costs calculated using standard life cycle costing (LCC) methodologies for a 60 year life.

The cost of waste itself identified using the true cost of waste techniques was roughly 15 times greater than the normal LCC estimation of waste.

Our study shows clearly that client/operators who have a real long-term vested interest in maintenance and operation costs should consider waste costs more carefully if they are to accurately address real future costs.

This project has highlighted that waste in WLC techniques is currently accounted for in a way which either ignores or reduces its perceived importance. In particular, the use of discounting has the effect of making costs in the future (negative investments) seem of less current value than might be reasonable.

The use of discounting techniques for projects in general is understood to be, by its nature, conservative and reasonable. The way in which negative investments or costs such as waste are dealt with by current WLC techniques throughout the life of the asset are not seen to be conservative and have the effect of reducing the impact of costs (such as waste) generated throughout the life of the structure.

The idea of service life is also interesting, in that it is commonly assumed that buildings last for 60 years. This assumption is not really valid in that the housing stock in the UK has large numbers of houses older than 60 years. When looking at longer study periods waste can often become more important than in study periods of limited life. WLC studies are often carried out for specific shorter term, financial decisions between two products or approaches.

Finally, the relative cost of throwing away waste material is likely to increase over the general rate of inflation in the short to medium term. This is a prediction, however, all indicators point to the rising costs of waste disposal. The use of tables allowing for this increase in cost allows the user to make assumptions and see their impact on costs.

When employed on a real project study (approx £6 million capital cost) the amended techniques showed that the cost of waste arising from a building over a 180 year life span (£700k) was of similar scale to the total lifecycle maintenance costs which had previously

been calculated using standard LCC methodologies for a 60 year life (roughly £800k). The cost of waste itself identified using the true cost of waste techniques was roughly 15 times greater than the normal LCC estimation of waste (£45k). The total LCC (including waste) rose to £2.5 million when employing the techniques, which indicates that current techniques may not adequately address future costs in general, i.e. not just waste costs.

The study looked at waste in specifications. Instances were identified where the cost of waste arising from specifications was two to three times that of another selected specification. It was anticipated that this study would show large differences in waste costs arising from different specifications. While the differences are substantial, their significance has not been proven by the studies carried out as part of this work.

The full study does show clearly that client/operators who have a real long-term vested interest in maintenance and operation costs should consider waste costs more carefully if they are to accurately address real future costs.

PROJECT PARTNERS

