

Best practice at Farringdon – Sustainability costs



Overview

The construction industry uses a significant volume of materials from natural resources such as timber, aggregate, concrete and steel. The manufacture and use of these materials can have a negative impact on the environment. In the Farringdon Project great consideration has been given to the sourcing of materials used on site and we have taken advantage of the opportunities given to reduce, re-use and recycle. Through design, supply chain management, specification, storage and use of materials we are doing as much as possible to fulfil Network Rail's policy and commitment on sustainability.

During April and May 2011, Network Rail commenced an analysis of the costs associated with sustainability criteria for Farringdon. They looked at the use of alternative materials in comparison to the more commonly used products for the following:

- ITH brown roof
- Construction power supplies using mains power
- Reuse of demolition arising from piling mat
- 100% recycled aggregate
- Recycling waste

Innovation

A cost reconciliation schedule was produced and reviewed at team meetings throughout April and May.

ITH 'brown roof'

The roof has been designed to improve the biodiversity of the area, create a habitat for low invertebrate species and micro-organisms, contribute to sustainable drainage and improve the thermal insulation performance of the building to reduce heating costs. The selection of an ITH brown roof instead of a 'conventional' roof finish has led to a saving of circa £30K.

Mains power or generators (construction supplies)

The cost analysis demonstrated that mains supplies are substantially cheaper than the use of diesel generators on the project. The main cost driver is the cost per month for generator fuel, an estimated saving of circa £600K on the total cost between using permanent power versus temporary.

Piling mat - use of recycled materials

To build the ITH a piling mat was needed to provide piling rigs and cranes a stable base to work from. Due to the size of the site, as much as 8,450 tonnes of rubble could have been brought to site by lorry. The use of recycled aggregate from the deconstruction of Cardinal Tower was less costly than the estimated costs for purchasing the material for the piling mat. This represents an estimated saving of circa £60k.

Aggregate - importing new material compared recycled

Based on the actual costs to date, the indications are that importing recycled aggregate is cheaper than importing new (virgin aggregate) from a quarry. As demonstrated with the piling mat, recycling aggregates on site can also be cost effective. To date, 64% of all aggregate used on site has been from a recycled source rather than virgin.

Waste – landfill compared to recycling

The cost exercise concluded that costs for landfill are more expensive than waste recovery due to landfill taxes and in some cases transportation and logistics. The transportation costs can vary drastically for landfill, due to locations of the landfill sites. For non hazardous and inert waste there is little difference between waste recovery and landfill costs. The project has been able to demonstrate high levels of recovery for most waste types. Almost all of our waste is diverted from landfill. 98% of the waste construction materials are recovered for recycling. 95% of other wastes are recycled and the remainder is recovered for energy from waste disposal.



ITH brown roof

Benefits

- Sustainable design and construction costs can prove to be more competitive than conventional design. There are also whole life cycle cost and maintenance benefits in adopting a sustainable design and procurement strategy on projects.
- The project design stage allows for selection and options for sustainable materials instead of conventional and commonly used materials.
- More cost effective in terms of operational use, maintenance and whole life costs.
- Savings on transportation of materials when recycling available materials on site and selecting sustainable suppliers within the UK, thus reducing carbon footprint.
- Waste for landfill site reduced with recycling, and transportation of waste.

Targets and objectives

The cost analysis associated with Network Rail's Sustainability criteria has helped us meet our targets and objectives in the following areas:

- CEEQUAL – material use; energy; waste management; transport;
- Farringdon Sustainable Design and Construction Strategy - transport; energy and carbon; waste; sustainable material use
- Farringdon Targets and Objectives – minimise waste; restrict carbon emissions; use sustainable materials in a sustainable way.