Material change for a better environment

Case Study: Construction Logistics

Working with the supply chain at RSME Minley to reduce deliveries and waste in construction

This case study describes how off site manufacturing techniques can reduce the number of vehicles going to site and help improve waste minimisation and management in the construction industry

Delivering a module at RSME

Key Facts

- Client: Royal School of Military Engineering.
- Contractor: Caledonian Building Systems.
- New accommodation blocks for the Royal School of Military Engineering due to be completed in 2013.
- Use of delivery management system to provide just-in-time material delivery schedule.
- A reduction in vehicle movements of 82% to site as a result of off site manufacturing.
- CBS construct approximately 73% of the project's value at the off site factory.
- Labour is minimised to around 20-25% of that required for traditional build.
- Identified opportunities for minimising packaging.
- Encouraged the use of reusable packaging.
- Instigated call off deals with suppliers.
- Worked with suppliers to ensure cut-to-size components.
- Influenced the design of construction components.

Overview

Caledonian Building Systems (CBS), based near Newark, Nottinghamshire is a construction contractor whose roots lie firmly in the off site manufacturing sector.

CBS has won a £42 million contract with Holdfast, to construct eight new accommodation blocks for the Royal School of Military Engineering (RSME) on three different training sites by 2013.

The modular approach allows a considerably shorter project time-frame, a high quality of construction, greater certainty of project costs and significantly reduces the number of deliveries entering the construction site.

This case study focuses on the delivery of modules to the RSME Minley, located at Gibraltar Barracks in Surrey and describes how the supply chain has helped improve waste minimisation and management.

Modules are manufactured in CBS's off site factory at Newark. The facility comprises four independent factories, covering a manufacturing area of 45,000m^2 and an overall area of 17 hectares.

CBS construct approximately 73% of the project's value at the Newark facility, resulting in minimal disruption on site. Materials on site are reduced which has an effect on reducing waste. Labour is reduced to 20-25% of that required for traditional build. Additionally, as the construction happens under a roof, materials delivered to site are stored within the facility away from the elements, minimising waste through unnecessary damage. The reduction of waste, delivery vehicles, handling and on site trade all have a significant Health and Safety benefit.

From Newark the modules are transported for installation and finishing at RSME Minley. The first phase of the project provides 149 ensuite bedrooms and was completed in March 2010 at a cost of £7.5 million.

Delivery Management

CBS's use of an in-house delivery management system ensures materials are scheduled to arrive at the site in a just-in-time manner.

With so much of the construction process completed in the factory, site deliveries were reduced by 82% during the monitoring period.

Once on site, modules are lifted by crane from the lorry straight into position. Typically eight, two bedroom modules are erected a day which dramatically reduces the construction programme and offers greater programme certainty.

Waste minimisation and management

Waste from construction is one of the principal waste streams to landfill sites. Manufacture in a factory allows far better management of the waste stream as materials can be used more efficiently, exact amounts of materials can be ordered and materials can be carefully stored.

CBS has a corporate responsibility to apply many initiatives within its operations to reduce the impact of its activities on the environment. Although the primary driver for CBS's move towards more sustainable operations is an ethical one, the company also realise tangible cost benefits and savings.

CBS currently reduces,reuses and recycles 100% of its waste and has proactively taken steps to minimise waste through its supply chain before it reaches its facility.

Initiatives being implemented include the segregation of materials into waste management containers (currently CBS segregate wood, plastic, cardboard, metal, plasterboard and residual waste) and the use of balers for plastic and cardboard packaging to minimise the use of space and ensure that only full skips are being sent off site.

Full utilisation of the skips provides a cost saving in itself but the use of balers means that all cardboard and plastic become valuable resources that can be sold back to the waste contractor. CBS report that this covers the cost of removing the waste from site.

CBS works with its suppliers in a variety of areas to ensure that they are maximising the waste reduction potential.

So far CBS has done the following:

Identified ways to minimise packaging:
To reduce over-packaging, CBS has worked with suppliers to reduce and eliminate packaging. In addition, after completed modules have been delivered, the packaging is returned to the factory for use on future projects after delivery to the site.

Call-off deals with major suppliers:
CBS has instigated deals with major suppliers for shorter lead times – within four weeks of starting a project, which reduces the time material is stored on site.

Cut-to-size components and design modification:
Materials such as flooring and plasterboard are supplied in size specifically requested by CBS to align with the module design therefore reducing the amount of off cuts.

CBS maintain good relationships with their suppliers by hosting regular meetings with the supply chain to identify new initiatives that could assist in reducing the amount of waste and deliveries to site.

Conclusions

CBS's work on the RSME Minley project has highlighted the benefits of off site manufacture and construction in terms of reducing waste, reducing construction lead times and improving health and safety.

Waste & Resources Action Programme

The Old Academy
21 Horse Fair
Banbury, Oxon
OX16 0AH

Tel: 01295 819 900
Fax: 01295 819 911
E-mail: info@wrap.org.uk

Helpline freephone
0808 100 2040

www.wrap.org.uk/constructionlogistics

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