

Sustainable demolition



The debate about sustainability in construction naturally tends to focus upon the reduction of consumption during the build stage. However, there is much that can be done before construction commences to reduce consumption says Paul Clarke-Scholes of demolition contractor, Clifford Devlin...

Demolition is potentially a very energy intensive operation and therefore presents considerable scope for improvement. There is also much we can do to influence and encourage the reduction of materials consumed during the build phase by re-using and recycling demolition arisings.

The concept of sustainability is translated into our everyday processes and procedures by our environmental management system. The 'continuous improvement' philosophy of the standard against which it is certificated, ISO 14001, encourages us to constantly monitor and analyse all our business processes to identify ways of implementing the three R's – reduce, re-use, recycle.

Reduce

The proximity of what we call 'sensitive receptors' (e.g. residential

property, pedestrians, live offices and shops and vehicles) adds an extra environmental-dimension to the discipline of inner-city and urban demolition, in which we specialise. The actual demolition phase is better described as deconstruction as it often involves progressive, internal part-dismantling using hand-held hydraulic equipment, which is very labour intensive.

We have a duty to minimise disruption to the local community and many of the measures we use to limit disturbance during demolition projects also have resource-saving aspects. For example, we will fit movement sensors and timers to minimise external lighting. Our traffic management plans are geared to reducing vehicle movements to limit congestion and reduce fuel consumption.

However, the increasing use of BREEAM guidelines in Planning

Consents, commercial drivers and the 'continuous improvement' ethos of ISO 14001 is encouraging the demolition industry to take consumption reduction to a new level.

The Building Research Establishment's Environmental Assessment Method (BREEAM) sets the standard for best practice in sustainable design and has become the de facto measure used to describe a building's environmental performance. It is the world's most widely used environmental assessment method for buildings, with over 100,000 buildings certified and over half a million now registered.

In order to benchmark and measure our progress in reducing energy consumption we now calculate the carbon footprint of every major project we undertake. We approached Professor Craig

Jones, head of sustainability research at Bath University to advise us on the practical steps necessary to gather, record and process the data. Professor Jones is co-author of the Inventory of Carbon and Energy (ICE) which catalogues embodied energy and carbon coefficients for materials used in the construction industry.

The site manager is tasked with collecting delivery receipts for gas oil and propane used to power plant and equipment. Electricity consumption is substantiated from bills and fuel for transport is calculated from mileage recordings made by the site gateman. Materials used in the demolition phase are determined from consignment notes and other documentation. This information is passed to our Environment team who, using the embedded carbon values in ICE, calculate a total carbon footprint for

the demolition phase of the project.

The footprint score has no real intrinsic merit – its value is relative. The discipline of calculating a carbon footprint score has enabled us to identify areas where improvements can be made and allows us to measure our progress. In 2007 our average carbon footprint was 14kg CO₂ per tonne of demolition arising generated. This has dramatically improved and now our most successful projects average around 6kg/tonne.

Planning and awareness are the key factors in reducing energy consumption. We scrutinise delivery schedules to maximise use of every vehicle journey. Double handle techniques are routinely employed to minimise movements of plant and waste. Staff are continuously trained and educated to use energy efficient techniques – simple things like switching off engines when not in use.

Re-use

It has long been our practice to consult with main contractors on ways to use the waste material we produce during the build phase. Crushed 'recycled' concrete aggregate (RCA) produced by structural demolition is routinely re-used on-site to create piling mats, as backfill or in landscaping. However, we now encourage contractors to be more creative and consider using

other waste materials, e.g. timber can be used for hoardings, bricks and slates can be used in the new-build. At a recent project roof beams were re-used as floor rafters.

Recycle

Any waste material which cannot be re-used is, where possible, transported to local recycling depots. Despite the limitations on space involved in inner-city projects we find ways to segregate and sort waste streams on-site – as dictated by the Site Waste Management Plan (SWMP) – which are removed to the appropriate destination.

Our procedures for re-use and recycling were recently observed and reported by the Building Research Establishment (BRE) as part of the Construction Research Efficiency (CoRE) London exemplar programme. Under CoRE the BRE offers organisations help and support on implementing resource efficiency measures.

The project involved the demolition of several blocks of flats at Kings Crescent Estate in London as part of a social housing and regeneration programme managed by ALMO, Hackney Homes.

The competitive tender required an SWMP to be prepared. The plan, which was based on the BRE's pre-demolition audit, listed the estimated quantities of each type of waste expected to be produced during the

demolition phase, the methodology used to recover them and their final destination.

Since then the preparation of Site Waste Management Plans has become a legal requirement for all construction projects exceeding £300k in value.

The segregation and management of the waste streams was carefully controlled as contamination can result in the load being rejected for recycling and tipped as rubbish. For example glass must be separated from any hardcore; timber must be free from MDF and any metal larger than screws and nails if it is to be accepted for chipping. Plasterboard can only be sent for gypsum reclamation if uncontaminated by timber.

Roof trusses were moved to the ground in large sections to allow timber salvage and the disposal of polythene and bitumen lining materials. Slates and roof tiles were carefully recovered for re-use depending upon their quality.

Bricks and concrete were crushed and left on-site as Recycled Concrete Aggregate (RCA) for use as backfill or landscaping purposes. Only materials such as MMMF, other insulation and polythene were disposed of as rubbish and removed to landfill.

Of the 3,011 tonnes of waste generated just 1.3% was removed for

landfill. 89% (mostly recycled aggregate) was re-used on-site for infill or landscaping; 9% (metal, timber, plasterboard) was removed for recycling.

"Having carried out a pre-demolition audit of the building, we anticipated as much as 85% of the demolition arisings could be recovered and re-used or recycled," said Szilvia Zakar, senior consultant at the BRE. "We were therefore very impressed with Clifford Devlin's performance in exceeding 98% and in particular their ability to recover plasterboard and wood during soft strip. This study demonstrated that if the will is present, higher rates of recovery/recycling can be achieved than previously thought."

Quite apart from the feel-good factor we receive from the knowledge that we are 'doing our bit' to conserve and sustain the planet's natural resources, the initiatives we have put in place to measure/reduce our carbon footprint and conserve resource consumption provide a number of immediate, tangible benefits for us and our customers.

For more information about Clifford Devlin use our online enquiry service at www.abc-d.co.uk/info quoting number 239

Send in a response claire.mackle@centaur.co.uk

Ecobuild goes European

The French Pavilion, at Ecobuild in March 2009 (Stand 1482), will showcase innovative companies in the field of environmentally-friendly construction and is supported by the French Trade Commission in the UK...

Driven by an ambition to achieve maximum energy savings in buildings, the French companies participating will be highlighting a range of eco-friendly building solutions that have been successfully pioneered and promoted.

A total of 15 'green' construction companies from France will be exhibiting at the Ecobuild trade show. These include:

DEMEURIA – www.demeuria.com, builds and designs Luxury-Eco timber-frame country homes and Eco-Family houses and **ARBONIS** – www.arbonis.com, has also become a major player in advanced timber constructions.

In Europe **GIORDANO** – www.giordano.fr, is one of the oldest manufacturers of solar thermal systems and heat pumps for hot water, space heating and cooling.

SILVADEC – www.silvade.com, produces wood/polymer composite deck-boards for terraces bridges and pools.

CD2E is a regional association based in Northern France, which is dedicated to supporting the creation and development of eco-enterprises such as: **ACT ENVIRONNEMENT** – www.actenvironnement.fr, **COGEBLOC** – www.cogebloc.com, **EAUX DE FRANCE** – www.eauxdefrance.fr and **LE RELAIS** – www.lerelais.org/Isolant-Metisse, which will be present on the CD2E stand – www.cd2e.com.

LENKKA – www.lenkka.com, is a French specialist in chimneys that are produced on the basis of advanced designs.

AMYTIS – www.amytis2.com, is a company which has developed a plant-based living wall system for interior and exterior use.

ARD has developed **ECOVIE** – an economical and environmentally-friendly construction process which is applied to paths, squares, and traffic areas.

ARCHITECTES INGÉNIEURS ASSOCIÉS (AIA) – www.a-i-a.fr,

has become a partner of choice in the field of large environmental projects, including water-treatment plants, energy rationalisation and use, eco-neighbourhoods, and constructions meet the highest of environmental standards.

AIA has put in place an Environment Management System that is ISO

1 4001-2004 certified, and which represents the outcome of a process of continuous improvement in project management.

Finally, serving businesses in the Languedoc-Roussillon region, **Sud de France Export** –

www.maisondelaregionlanguedocroussillon.com, driven by the regional council, supports its regional enterprises in the

eco-construction, solar, wind and biomass fields, with the latest technologies.

NCN (New Clinic in Nantes) – CCS, Nantes France (AIA project)



Wesley French Hospital in Abu Dhabi United Arab Emirates (AIA project)



For more information about The French Pavilion use our online enquiry service at www.abc-d.co.uk/info quoting number 12