

Waste reuse and recycling in c&d

Construction and demolition waste: a guide

- Halving waste to landfill commitment
- Why reuse should be pushed
- Masdar: zero waste exemplar city
- Construction and demolition waste online
- Waste companies directory

Supported by:



brownfieldbriefing

sustainablebuilding
property forecast

newzeye
publication

PAST PRESENT + *FUTURE*

Thinking about tomorrow, today



Contents



Drivers of waste reuse

- A commitment to halving waste to landfill** 4
WRAP explains the Halving Waste to Landfill commitment
- The challenge of increasing reuse** 6
BioRegional asks why are we now shying away from waste reuse?
- Landfill Tax financial implications** 8
Davis Langdon explores the ins and outs of landfill tax rules and available relief

Case studies

- Masdar: city of the future** 9
Lord Norman Foster on his exemplary zero waste city masterplan
- Construction resource efficiency** 12
The Environment Agency's lessons on construction waste management
- Resource conservation, before and after** 14
Land Securities on managing waste during design, construction and throughout a building's occupation

Directory

- Waste companies in the UK: our directory** 10-11

Waste streams

- What wood would become** 15
Oxford Wood Recycling shows us the benefits of reusing wood 'waste'
- Waste soils from land redevelopment** 16
Campbell Reith explains how surplus soil from construction sites is defined as waste

Communications

- Construction waste... online, in time** 18
Earth Exchange ponder the rise of waste exchange websites
- Talking the talk in waste facilities** 19
Hyder Consulting on communications and waste infrastructure procurement

For details of our authors, please refer to the directory on pages 10-11

Photos (clockwise from left) by Foster + Partners, Oxford Wood Recycling and D'Arcy Norman

From the editor

Waste is an important part of construction and demolition. The sector consumes natural resources and demands unnatural ones, emitting greenhouse gases to produce the materials it needs, many of which are later sent to landfill.

In fact, DEFRA says: "The construction industry is a major source of waste in England, using the highest tonnage of solid material resources in any sector, over 400m tonnes. The construction, demolition & excavation (CD&E) sector generates more waste in England than any other sector, and is the largest generator of hazardous waste, around 1.7m tonnes."

This massive waste problem inspired the Government's *Strategy for Sustainable Construction* target to halve the volume of CD&E waste sent to landfill by 2012, and the subsequent voluntary agreement framework set up by WRAP, discussed on page 4. Then in 2008 mandatory site waste management plans were introduced for all construction projects in England costing over £300,000. These set out where waste will arise and how it will be reused, recycled or disposed of, encouraging the consideration of waste during the early stages of projects.

Householders may have been influenced by the political and social attention that recycling has been given in recent years. According to DEFRA statistics for 2008/09, the national domestic recycling rate has increased while household waste sent to landfill decreased from 15.5m to 13.8m tonnes. However, this may not necessarily be mirrored in CD&E waste figures and, as BioRegional points out on page 6, recycling may be up but reuse is less prominent. Could the recession bring about a reuse resurgence?

One case study here highlights the ultimate goal: a new, zero waste city. Masdar is an inspirational example of integrated planning which even makes use of remaining waste by converting it into energy, a solution gaining popularity. In the UK, seven places have been selected for 2009/10 as Zero Waste Place projects, which are expected to go as far as possible to reduce their waste. One can't help but wonder whether the results there will be as impressive.

Ella Taylor

Managing Editor: Ian Grant

Editor: Ella Taylor

Sales: Cheryl Henry and Vicky Hague

Marketing: Pooja Ladva

Printer: Premier Print Group, 25-31 Violet Road, London, E3 3QQ

Published by Newzeve Ltd, London NW10 5LJ

Tel: 020 8969 1008 email: customerservice@newzeve.com

© Newzeve 2010. All rights reserved. No material may be reproduced in whole or in part without the permission of the copyright holders.

www.brownfieldbriefing.com

www.sustainable-build.com

A commitment to halving waste to landfill

Construction Commitments: Halving Waste to Landfill was launched by the **Waste & Resources Action Programme** (WRAP) more than a year ago. A voluntary agreement developed to help deliver the Government's *Strategy for Sustainable Construction* target to reduce construction, demolition and excavation waste sent to landfill by 50% by 2012, the response from industry has been exceptional, says **Mike Watson** of WRAP.

Considering the challenging economic situation that currently plagues the construction industry, the recruitment of 200 plus signatories demonstrates a genuine commitment to tackle waste sent to landfill firmly and with clear direction.

Organisations from across the entire supply chain have signed the commitment and the combined influence of all signatories now represents more than one quarter of the industry's annual £100bn construction spend.

Clients and contractors currently lead the way. Eight of the UK's top 10 contractors are signatories, as are half of the top 50 contractors, including Balfour Beatty, Laing O'Rourke, Wates, ROK and Bovis Lend Lease. Signatories represent 70% of the value of new work won over the past 12 months by the top 50 contractors.

As ultimate budget holders, client commitments are proving essential to the success of the programme in driving waste reduction down the supply chain. Indeed, feedback from industry is that client demand remains one, if not the biggest, influencing factor in ensuring action on waste reduction. Current signatories mandating good practice include organisations as diverse as M&S, Defence Estates, British Land, Crossrail and the Olympic Delivery Authority.

ASDA, one of the first to commit to halving waste to landfill, used WRAP's One Year On anniversary event in October 2009 to showcase its exemplary waste reduction achievements and set the standard for industry peers. At its Minworth store refurbishment, ASDA succeeded in getting its entire supply chain to sign WRAP's agreement by requesting evidence of a practical commitment from its partners to delivering against ASDA's own corporate sustainability requirements.

Bob Simpson, head of sustainable development at ASDA, explains: "For us, waste is cash and any prudent business will



be focusing on their bottom line right now. We already have a corporate commitment to achieve zero waste to landfill by 2010, and any environmental or financial savings that we make by reducing or reprocessing waste can be reinvested into our stores and customers." For other companies looking to similarly instruct their supply chains to take action on waste reduction, template letters are available on www.wrap.org.uk.

A challenge...and an opportunity

The growing number of cross-supply chain signatories is testament to the increasing understanding industry has of its opportunity and responsibility to reduce construction waste, as well as of the rewards associated with the efficient use of resources. In terms of figures, construction consumes an astonishing 400m tonnes of resources annually and produces 120m tonnes of waste. Reuse and recycling ensures that less than 20m tonnes of that figure is buried, but that still represents a huge amount sent to landfill.

Putting these figures into context, the value of unused materials, stuff which is simply surplus to requirements, is currently estimated at £1.5bn per annum. Those materials have all been extracted, processed,

and transported to site at considerable expense and are then just thrown away! Even though it may not seem immediately important if, for example, aggregates are put back into the ground, consider the energy and money wasted in their extraction and transportation. Then it does matter.

In project terms, a cost benefit analysis conducted by WRAP across a series of flagship projects in 2009 showed that good practice in reducing and managing waste can save up to 1.5% of the total construction costs. At a national level, if just 40% of projects adopted good practice by 2012, the collective net saving would exceed £300m.

For businesses, these potential savings are proving impossible to ignore. Willmott Dixon calculated that the value of its wasted materials, and the cost of disposal, amounted to 10% of its turnover. As a result the company is now committed to sending zero waste to landfill by 2012; an objective that makes sound business and environmental sense.

Working together

Collaborative action from the entire supply chain is critical if the construction industry is to halve waste to landfill and



reap the associated cost savings. We view the supply chain, in simple terms, as client, designer, contractor, manufacturer and waste management contractor. Every link is essential and WRAP is there to help every section of the chain.

In delivering this support, we have developed a number of online tools to help all parts of the supply chain get to grips with waste. These include model procurement wording, client guidance, Site Waste Management Plan (SWMP) templates and the Net Waste Tool, a tool for calculating the overall waste generated from construction projects. WRAP also ran briefings and workshops in 2009 which attracted more than 1,000 attendees from across the industry. As awareness of the importance of waste reduction has improved, the content of these workshops has changed to reflect this, to equip attendees with hands-on knowledge to take action on waste.

A key priority for us now is working with those sectors that have been less engaged in resource efficiency to date. In line with this, a key focus for the next 12 months is liaising directly with designers and waste management contractors and assisting these professionals in determining how best to work waste out of the equation.

Regarding designers in particular, research shows that the biggest reductions in construction waste can be achieved by decisions made on the drawing board. There is great scope for designing out waste – whether that is in the reuse of excavated ground as fill, or in the choice of materials. Contractors know about waste, they see

it and shift it every day. Designers are less directly engaged, so it's often just a case of asking the architect to consider waste as a higher priority.

Some of the leading design consultancies are already in agreement. Keith Clarke, chief executive of Atkins, says: "We've already demonstrated – at the Olympic Park enabling works for example – that it is possible to reclaim or recycle more than 90% of materials from demolition works. This is universally achievable, but we can do even better if we can get the effort and commitment from clients, contractors and designers collectively to work this out so we're designing out waste right from the start of every project."

WRAP has a series of design resources and tools that will help designers take immediate action on waste (*Designing out Waste: A Design Team Guide for Buildings* and *Designing out Waste: A Design Team Guide for Civil Engineering* can be found at www.wrap.org.uk/construction). WRAP is also soon to launch two new applications to its Net Waste Tool developed specifically for designers of both buildings and civil projects. The outline design tool for buildings and outline design tool for civils will enable easy calculation of the potential cost and environmental benefits of design decisions on individual projects.

Completing the chain

In 2010, WRAP will also be working directly with waste management contractors. Inspiring action in this sector is essential if the industry is to halve waste to landfill, ensuring all are working towards the same sustainable end.

Waste management contractors offering a better service to their customers (ie construction contractors and clients) in terms of recovering a greater proportion of the waste and, very importantly, providing them with better data on their waste, will benefit commercially by securing more work. Contractors are increasingly demanding a better service and those waste management companies who can't offer it will ultimately go out of business. Waste management contractors are increasingly seen as 'resource consultants' rather than 'collectors of material'.

Many waste management contractors are already demonstrating a real commitment to lowering waste levels. However, feedback from clients is that the provision of more robust data and

closer lines of communication will be fundamental to success moving forward. It is for this reason that WRAP has developed the Site Specific Waste Analysis Tool, following consultation with industry. This enables waste managers to easily prepare a detailed analysis of their waste inputs, and the route of recovery or disposal.

Six waste management contractor case studies are currently available on the WRAP website, offering real life examples of the practical and economic advantages for these businesses in supporting contractors in reducing waste.

Good business practice can include anything from individual waste stream segregation, accurately measuring and reporting recovery rates, to recycling material back into a product that can be returned for use.

Recognising achievements

Underpinning all of WRAP's work with the construction sector is the need for robust management and accurate reporting. Only by recording achievements can an accurate picture of progress towards this industry and governmental target be developed.

The Halving Waste to Landfill Reporting Portal has been developed specifically with this issue in mind, and WRAP is keen to encourage all signatories to use of the portal to report their achievements. Not every signatory needs to halve their waste, nor indeed could many. But each and every company can reduce waste to some degree, and each reduction is essential to the end result. The fundamental message WRAP wishes to convey is that everyone can make a difference – which is why Halving Waste to Landfill asks that signatories set their own targets, according to their individual business capabilities.

Based on targets that have already been set, there are sufficient commitments to divert a potential three million tonnes of construction waste from landfill. That is a significant proportion of the target for 2012.

We're well on track to meeting the 2012 goal. With new campaigns building momentum and ongoing engagement with the core construction supply chain, better practices in waste management promise to lay firm foundations for a more efficient, sustainable construction industry.

Mike Watson
Head of construction
WRAP

The challenge of increasing reuse

Construction materials have been reused and remanufactured in the UK since at least Roman times, but in the past decade there has been a shift away from reuse towards recycling, and latterly towards energy from waste, as reuse becomes more difficult. **Jonathan Essex** of **BioRegional Development Group** asks why this is happening, and what we can do as a result.

Reuse is the second highest priority in the UK Government's waste hierarchy, after reduction. Reuse strategies typically lead to a greater reduction in waste to landfill, greater savings in carbon emissions, and more jobs in the construction and waste industries than recycling alone.

Why reuse is better

Reuse reduces waste to landfill in a variety of ways, evidenced by the following:

- Once you get 90% of waste diverted to landfill the best way to reduce waste to landfill further is to reduce the total amount of waste in the first place. Reuse and waste prevention can provide the latter, but recycling can't.
- Research shows that moving up the waste hierarchy results in a behaviour change, so that the overall level of waste can be reduced. For example, in Shropshire the introduction of doorstep food waste composting has led to overall reductions in food waste and packaging
- Action learning theorists recommend that a transformational change approach is adopted, where problems are of a complex and dynamic nature. Change will result from such a process but not in a predictable or managed fashion (see http://randd.defra.gov.uk/Document.aspx?Document=SD14002_3822_FRP.pdf). Reuse has a greater potential to be transformative, as it enables a shift from surplus items to be set aside and reused rather than thrown away. This retention of responsibility enables a cultural shift in thinking and action to occur, and to impact wider workplace changes, which is referred to as co-occurring behaviour
- Recycling often is turned into a product that is then landfilled or downcycled at the end of its life. It is harder to reuse some composite materials which have a high recycled content than to repair and reuse a robust product another time. Products with a high recycled content do not remove the need for design for deconstruction

New waste hierarchy

1. The following waste hierarchy shall apply as a priority order in waste prevention and management legislation and policy: (a) prevention; (b) preparing for reuse; (c) recycling; (d) other recovery, eg energy recovery; and (e) disposal.
2. When applying this waste hierarchy, member states shall take measures to encourage the options that deliver the best overall environmental outcome. This may require specific waste streams departing from the hierarchy where this is justified by life-cycle thinking on the overall impacts of the generation and management of such waste.

European Parliament (2008) Waste Framework Directive [2008/98/EC], Article 4 extract. <http://eur-lex.europa.eu>

- Reuse needs first class segregation in place on site, a real change in site waste management operations and culture - so if you do reuse, you are implementing site waste management practice, not just writing site waste management plans.

Reuse provides greater savings in carbon emissions as it retains all of the embodied carbon used to make a product. Wasting products (new or old) wastes the carbon dioxide used to make those products, while reusing products allows that amount of carbon dioxide to be saved. The emissions savings are made every time a product is reused in place of a new product. Recycling only recovers a fraction of this carbon. For example, scrapping and re-melting steel recovers only 440kgCO₂/tonne of the 2,780kgCO₂/tonne of steel in one steel section, all of which is saved when a steel section is reused (see ICE database version 1.6a at www.bath.ac.uk/ice).

Research by the Institute of Local Self Reliance in the US has shown that investment to increase reuse creates around 10 times as many jobs as building energy-from-waste plants. This is supported by

guidance in the EU which considers the job creation for processing 1,000t of waste per annum to produce one job if the material is landfilled, between two and four from energy-from-waste and around 25 if a reused collection and retail occurs.

Strategies

The UK's *Strategy for Sustainable Construction*, produced jointly between government and industry bodies, sets out an overall waste target of halving waste to landfill by 2012. This is supported by producing guidance for waste reduction, together with plans for product resource efficiency, reduction of packaging waste and an increase in plasterboard recycling. There is no focus on reuse or reclamation in the targets, or any recognition of the higher value in following the waste hierarchy. By classifying reusable construction materials as waste, by conflating reuse with recycling, and by focusing on landfill diversion rather than the waste hierarchy, policy may actually have contributed to the decline of reuse in the past decade.

However, this waste hierarchy is not new. It was adopted by DEFRA's waste strategy in 2007. A revised strategy was confirmed by new EU waste rules agreed in 2008, which means it will soon need to be enforced across all government departments. This places reclamation of existing materials and reuse of these reclaimed materials (along with surplus new materials from over-ordering and so on) as a priority over recycling. This means that decisions about whether to reuse a product, to recycle it, or recover energy from the material the product is made from, should be made on environmental rather than economic grounds. This requires a rethink in what is considered 'sustainable' construction practice.

The main focus in reducing the UK's CO₂ emissions is on the outcomes of construction: lower emission buildings, the growing retrofit agenda, and sustainable communities. While this focus is certainly

Push for construction waste reuse needed

Last month Bioregional, together with Salvo, published a report called *Pushing reuse* (reported in December 2009 issue of *Sustainable Building*).

The report said that Government actions are hindering reclamation of building materials and causing a decline in the amount that is reused.

Pushing reuse recommended that the Government take on a 'reuse champion' to push for change and make reclamation a higher priority, in line with its own policies. It said that recycling has grown significantly, as it has had government support, despite being a less sustainable solution.

At the time Jonathan Essex said the report "clearly shows the benefits that reuse brings over recycling. For example, if we reclaimed 50% of reusable iron and steel, the carbon savings would be equivalent to taking 29,000 cars off the road – and that's for just two materials.

"Yes, reclamation is currently more labour intensive than recycling which makes it more expensive, but it creates green jobs and products that often have a higher value than recycled – for instance reclaimed bricks are worth much more than bricks recycled into aggregate".

The report said a 'reuse champion' would direct investment into making reclamation quicker, safer and cheaper, and promote the benefits of reuse to a wider audience.

It said the Government also needs to invest in storage and reprocessing capacity for construction materials being reused, and prioritise reuse above recycling by paying per tonne of material diverted from landfill to reuse, as it currently does to WRAP for waste recycled rather than landfilled.

Simple policy options could also help promote reuse, the report said. Planning Policy Statements for local authorities should support reuse, with reuse targets set on a local scale and temporary storage for reclaimed materials also made available locally.

On a wider scale, it also suggested that construction materials be included in the EU Emissions Trading Scheme, to incentivise reuse.

<http://www.bioregional.com/files/publications/PushingReuse.pdf>



This Japanese standing lamp and picnic table reused 'waste wood' salvaged by Oxford Wood Recycling (their feature on page 15)

required, the construction industry must also take responsibility for measuring and reducing our own carbon emissions, as they account for around 15% of the UK's total (see the new report by the London Sustainable Development Commission, *Capital Consumption*). The majority of this, according to Lazarus's 2005 *Construction Material Impact Reduction Study*, is due to the carbon embodied in construction materials.

The Strategic Forum for Construction has agreed targets for a 15% reduction in carbon emissions from on-site energy use and transport – the same emissions that will fall under the Carbon Reduction Commitment Energy Efficiency Scheme from April 2010. But until it is normal for the overall carbon emissions of construction projects to be minimised at the project's outset and then measured and reduced as a contractual requirement, a shift towards greater reuse would appear unlikely.

But such an opportunity already exists. The planning policy statement *Planning and Climate Change – Supplement to PPS1* implies that the climate impacts of demolition and new construction should be minimised when new projects are approved.

The first aim of this policy states that planning "has a significant role in helping to secure enduring progress against the UK's emissions targets by direct influence on energy use and emissions".

Designing in opportunities to refurbish or deconstruct existing buildings will reduce the embodied carbon required for new construction. Likewise, going beyond the drive of the Site Waste Management Plan to segregate waste, to actually reuse surplus product locally will also reduce the overall carbon footprint of construction in the UK.

However, despite all these good reasons to increase reuse, the reality is that the last decade has seen a reduction. The BigRec survey carried out in 2007 by Salvo showed that in the last 10 years the amount of construction materials reused in the UK has plummeted by 25%.

Clear leadership is required

Reuse's position at the top of the waste hierarchy should be matched by greater support from central and local government, and by action from within the industry. Investing in reuse enterprises to improve supply chains would create new low carbon jobs. Stronger enforcement of Site Waste Management Plans could be combined with training to embed a greater culture of waste prevention and reuse on all our sites. Informed contractors could support the establishment of new centres run by social enterprises to reuse surplus building materials locally, similar to a model being promoted by BioRegional.

Alongside this, putting reuse and the embodied energy of materials at the heart of local planning policy could free up land for reuse, and ensure that reclamation and reuse are required by planners and embedded in construction contracts.

Leadership is required to make this link between a resourceful construction industry that puts reuse above recycling, and a sustainable one that measures and reduces its carbon footprint. Now is the time for government and the industry to act.

Jonathan Essex
Reclaimed materials manager
BioRegional Development Group

Landfill Tax financial implications

The last two years has seen some major changes from the government towards Landfill Tax and Land Remediation Relief (LRR). **Robert Jones** of **Davis Langdon** explains the main points.

While wholly separate fiscal schemes, both Landfill Tax and LRR are connected through the financial implications that they have on developing brownfield land. More than ever, they both need to be understood and considered carefully before commencing work on previously developed land.

Originally introduced in 1996, Landfill Tax was the UK's first environmental tax to incentivise more sustainable waste management solutions. An exemption used to exist for the remediation of contaminated land, in recognition of the significant barrier that the tax can be to the clean-up of former industrial sites. However, this was withdrawn in late 2008, with transitional arrangements in place until 2012.

If Landfill Tax is the stick, the Government eventually introduced a carrot five years later. Land Remediation tax Relief was introduced in the Finance Act 2001 to encourage regeneration of contaminated land. In tandem with the withdrawal of the Landfill Tax exemption for remediation works, the Government has redirected some of the additional revenue into a modified LRR legislation, effective from 1 April 2009.

Future legislation and 'escalator' effect

The tax was always set to increase over time, known as the 'Landfill Tax escalator', but in the 2007 Budget the Government announced a big increase on the rate and top level that would be reached. Annual increases are now £8 per tonne as opposed to the previous £3/t for the top tax rate. This will continue until at least 2013 when the rate will be £72/t, which will be the highest in Europe.

The Government now considers it timely to review the legislation underpinning the tax and the way in which that legislation reflects environmental protection legislation and waste industry practice.

The EU is a driving force on this agenda, with targets for reducing the amount of waste going to landfill for member countries. In addition, the unfavourable outcome for HMRC in their dispute with Waste Recycling Group regarding taxable activities has added momentum to the need for review and modernisation.

Landfill Tax

Landfill Tax is levied on licensed landfill sites at the following rates from 1 April 2009

Cost per tonne	What	What's included?
£2.50	Inactive or inert wastes	Soil, stones, brick, plain and reinforced concrete, plaster and glass
£40	All other taxable wastes	Timber, paint and other organic wastes generally found in demolition work and builders skips

The 2009 Budget announced a consultation on Landfill Tax, considering in particular the definition of a taxable disposal, taxable activities, taxable area and the measurement and categorisation of waste. Responses were also sought on the types of waste that should qualify for the lower tax rate and the use of transitional rates for any that change as a result of post-consultation changes.

The period for responding to the consultation has closed, and the Government intends to respond in spring 2010. A summary of the responses received was published by HMRC in December 2009.

Industry consensus is that the new legislation, once finalised, will raise the cost of Landfill Tax over and above the known effects of the escalator.

Many wastes such as pulverised fuel ash, brine waste and used foundry sands are expected to now fall within the higher tax rate. This is at a time when the cost of landfill tipping is also predicted to rise until 2012 as the supply of space within landfills is in demand. This should visibly stimulate changes in attitude towards sustainable remediation technologies, as desired. However, while treatment is typically a more cost-effective solution currently, many are anticipating its cost to rise above the rate of inflation as demand increases and the environmental technologies industry tries to react.

Land Remediation Relief

The relief allows a company, if it has invested in remediating contaminated land, to deduct 150% of its clean up costs from its pre-tax profits, or, if the company makes a loss, the expenditure can be treated as a qualifying loss for which a tax credit is

available. For most claimants, this can yield a benefit worth 14-42% recovery of qualifying costs.

The positive changes introduced last year with the funds raised by the withdrawal of the Landfill Tax exemption include the allowance of cost for treating Japanese knotweed and an increase in the scope of costs that qualify for LRR where these costs are incurred on long term derelict land.

However, the Government also introduced more restrictive entitlement conditions. As developers and housebuilders are looking to reduce financial risk by more innovative ways of acquiring land for development, companies may find themselves inadvertently falling short of the more onerous requirements.

What now?

Taking waste to landfill will clearly cost a lot more in future, but exactly how much more does not appear to be properly appreciated in the market place. Construction price indices continue to talk in terms of deflation, but this certainly does not apply to the disposal of contaminated soils. We may see more sites struggle as the basis of development appraisals does not accurately reflect the future reality.

More worryingly though, with lower land prices in the current economic climate, we predict that fewer developments will commence as the industry adjusts to the higher costs. In these situations, it is even more important to plan properly and make use of the valuable incentives available, like Land Remediation Relief.

Robert Jones
Associate
Davis Langdon

Masdar: city of the future

Masdar City in Abu Dhabi has been heralded as the world's first zero waste, zero carbon city. **Lord Norman Foster**, founder and chairman of **Foster + Partners**, explains how these elements were integral to the sustainability of his masterplan for the development.

Like many Middle Eastern states, Abu Dhabi built its modern economy on oil production. However, the Masdar Initiative is unique in the region in recognising that we must develop alternative energy models if we are to reduce the environmental impact of our contemporary lifestyles and live within a wholly sustainable framework.

Masdar has far reaching significance in global terms, in that it tackles design in a holistic sense. It is not specific in terms of individual buildings, important though they may be. Instead it looks at the bigger picture. Architecture comes down to buildings, and urban planning comes down to infrastructure. Those two elements are normally considered separately, but Masdar brings them together as its central thesis – and you can only do that at the level of community planning.

Another way of describing this process is 'urbanisation'. Today, more people live in cities than in the whole history of civilisation and that pattern is accelerating. That raises questions: what are the models for these new cities and how do we adapt existing communities to accommodate rising populations?

First, as an optimist, I would say that to believe in a sustainable future is to trust that it will result in a better world. The city of the future has to be a more attractive place in which to live and work. If Masdar or any sustainable initiative does not result in a great place to be, if it isn't a city that you really want to live in or visit, if it does not lift the spirits, then it is not fulfilling a central part of its function. Second, to be sustainable, we have to build for the long term. Flexibility is a key consideration. Masdar will be finished in 2018, so it has to be able to respond to new technologies that will have an impact on the way we live in the next 10 years and beyond – things which have yet to be invented and that we can only dream about now.

The ambition of Masdar is to create a high-density, welcoming, enjoyable community that is also carbon neutral and produces zero waste. To do that in any climate, in any



Photo by Foster + Partners

country in the world would be a challenge. In a desert environment it is especially demanding – I have likened this to the challenge in the past of putting a man on the moon.

Masdar covers a site of 580ha, will have a population of 90,000, and be constructed in several phases over the next 10 years. The land immediately surrounding the city will be used to 'farm' renewable energy for use by the community and this organisation will produce a carbon-neutral balance over the year. The city relies on a range of renewable energy strategies, including the extensive use of photovoltaic technology, both to provide power during the construction phase and over the city's lifetime.

Evacuated thermal tubes will be integrated into buildings to provide hot water; and the feasibility of a deep geothermal 'hot rock' borehole is being evaluated to provide a constant source of high-temperature water or steam to drive a system that will provide 24-hour cooling. Throughout the city, waste streams will be segregated and recycled. Applicable waste streams will be composted and the product used to fertilise the surrounding plantations. The remaining waste will

be employed in a waste-to-energy plant to provide supplementary power. The plantations that edge the city also form a landscape barrier which provides a natural filter against sand storms, which occur frequently in the region.

Shifting focus yet further, what makes Masdar especially significant is the fact that it offers a blueprint for the sustainable 21st century city, not just in Abu Dhabi or the Middle East but worldwide. Crucially, its design springs from the recognition that to survive, we have to change, and that with change can come a better way of life. Imagine such a city in an American, European or Far Eastern context and while it might be physically different its underlying philosophy would be the same. It is a classic example of the need to think globally and act locally; and never has that imperative been more appropriate than today.

Lord Norman Foster
Founder and chairman
Foster + Partners

Taken from a speech to the World Future Energy summit, reproduced with the kind permission of Foster + Partners.

Construction resource efficiency

Research will shortly be published by the **Environment Agency** on its own progress with construction waste and recycling, in a report called *Construction resource efficiency – Environment Agency experience and lessons*. Policy advisor **Martin Fodor** gives us a preview.



The Eden & Petteril Flood Alleviation Scheme, detailed overleaf

The study was originally proposed in 2006-7 and is part of the Environment Agency's Evidence programme, which provides and tests evidence to back up our position taken.

The aim was to see if we, as a construction client in our own right, lived up to our wish to promote reuse of aggregates. There have been formal targets for all major projects that are in our main national capital programme for some time. These were monitored with a basic percentage statistic for some years.

We identified the need for our targets and requirements to be studied in a scientific manner to understand the process and obstacles better – for instance to see how well we do against any established benchmarks, to ask what we could do better and whether there are lessons for others too. We also wanted to assess how our requirements affect our contractors, and if we can compare notes with other public clients.

While the research gained funding for 2007-9 and was about to start work, events moved on. The development of the *Strategy for Sustainable Construction* saw the Government working with the Strategic Forum for Construction, and the

Construction Commitments were launched in June 2008. These commitments include one on halving construction and demolition waste to landfill by 2012 (see feature, page 4).

The EA client side duly signed up to the *Construction Commitments*. This relates to a construction capital programme of about £250-300m per year.

The study progressed and publication of a timely report with case studies is anticipated early this year. It shows, perhaps for the first time, how a prominent construction client has been subject to a detailed and scientific assessment of how well it has performed in construction resource efficiency.

What did we find?

Since 2006, all construction projects have monitored their performance on 'use of secondary and recycled aggregates', 'reuse and recycling of construction waste', 'extent of sustainable timber use' and 'environmental incidents.'

But the study now reveals how wide-ranging the approach to resource efficiency is, though it was initially an unstated aim rather than an explicit goal, from project conception though to construction, including site waste management.

Case studies

Case studies in the report assess:

- Actions taken to reduce the volume of works required
- Actions taken to ensure optimum use of materials (recycle, local supplies)
- Actions taken to design out carbon usage from works
- Materials specified/ procured to avoid materials from non-renewable sources
- Actions taken to minimise temporary works
- Actions taken to record resource efficiency
- Lessons learnt from the project and whether anything could have been done differently to improve resource efficiency
- Any restrictions placed on the project (eg cost, timescale, specifications, seasonal constraints and so on) which made it difficult to achieve targets
- Any barriers which made it difficult to achieve resource efficiency
- Specific evidence of resource efficiency during the project, including quantities
- Highlights/ wins taken from the value register

The research also shows:

- Use of value registers to promote savings in projects has made great resource savings
- Our promotion and communication of best practices with our framework agreement construction contract partners make a difference
- We are already improving procedures to increase resource efficiency
- Contractors say that what they learn from working with us they take to other projects.

Why does this matter?

The EA has a role to play as a leading sustainable construction client. We procure and commission a considerable number of construction projects, both large and small, and we manage and maintain a wide range of existing property, assets and land. We know that understanding and take up of sustainable practices across the construction

sector are helped by sharing the experience and lessons we have gained from this.

National Capital Programme Management Service (NCPMS) manage our main construction capital programme and have a major role in developing and implementing best practice in these construction projects, which are mainly flood risk management schemes.

Our *Construction Resource Efficiency* report found that key to NCPMS's resource efficiency success are:

- Improved procedures such as 'Sustainability Risk Assessment' to give guidance
- Client contractor partnership and early involvement to bring supply chain knowledge
- Use of our 'alternative products and materials' schedule
- Use of value register and whole life costing
- Use of financial incentives for framework contractors
- High quality and extensive on-site supervision and management
- Use of internal awards to recognise good practice and excellent projects – many submissions dealt with resource efficiency.
- 'Current' magazine – edited with our construction framework partners – is used to share good practice

Recommendations

Recommendations for improvement made in the report include:

- Raising awareness of resource efficiency and how it should be implemented
- Better data collection, measurement and recording of achievements
- Develop stronger procedures to improve consideration of resource efficiency at all stages of design and construction
- Increase Key Performance Indicators focus on resource efficiency

The experience of the EA is useful to others. The lessons are described in several case studies and show that a comprehensive approach can make a real difference, even before the goal is made explicit.

Actual resource efficiency varies from year to year and waste reduction is dependent on many specific factors. Savings spread from project conception to design to on site practices. While not all can be measured precisely, they all make a difference.

Martin Fodor
Policy advisor
Environment Agency

Case Study – Eden & Petteril Flood Alleviation Scheme

This £12m scheme created 4km of new and improved flood defences in Carlisle. Work included raising and replacing existing embankments and walls, stabilising existing structures using a pali-radice piling (mini-piling) system, diversion and restoration of a watercourse, construction of a flood storage reservoir and fluvial pumping station. The project was fast tracked following a flood event in Carlisle.

To reduce the volume of works required:

- Existing embankment material was reused
- The crest width of low embankments was reduced from 4m to 2m with an agreement that maintenance would be carried out from ground level. Side slopes were set to 1 in 2.5 in order to reduce the footprint of the works, while still enabling maintenance

To ensure optimum use of materials:

- A design objective was to utilise existing defences and on-site material
- The EA assessed potential contractors' procedures for procurement of materials to ensure optimum use
- Prior to the contract award the contractor identified a landfill site that was about to be opened. The contractor was able to secure excess clay for use on the scheme for zero cost, except for extraction and transportation. Lab testing of materials and a trial compaction exercise was undertaken to ensure the material was suitable for use
- Embankments were designed to have a clay core with good quality shoulder material to reduce the need for a whole clay embankment
- The original reinforced concrete wall design at Catholic Lane was changed to a shortened sheet piled wall. This reduced cost, time and volume of works and the need for costly and disruptive sewer diversions
- A suitable secondary fill material sourced from another site was used in embankment construction
- Material used for haul roads was incorporated in embankment shoulders
- A package of acceptable temporary flood resilient measures was developed to enable protection of a store during construction. The alternative would have been to construct flood defences around the periphery of the store, which would have involved much greater material volumes, costs and increased time
- Works were undertaken to alter (raise) the road alignment at the Tesco entrance so that the road itself could act as the flood

defence. This meant that the need for a large floodgate was avoided

- A combination of relocating a pumping station and reviewing the standard of protection avoided 100m of sheet piled wall works to the upstream channel of a tributary
- Options for the alignment of flood defences in the area were reappraised. The final alignment allowed the avoidance of circa 100m of sheet piled wall
- The design identified a section of the works that passed through a disused tip. To avoid removal of the contaminated material, agreement was reached with the EA and local authority to encapsulate contaminated material in clay and a geomembrane and form part of the flood defence embankment.

Early consultation ensured that the design did not have to be changed during work on site, for example because of landowner restrictions. Bespoke coping units were cracked when they arrived on site. There was a risk the cracking could develop into spalling through for example, freeze/ thaw conditions. Rather than reject the copings, solutions were researched. Using a specialist product, the cracks were filled to make an effective seal on the outer surface without detriment to aesthetics.

A Value Register was kept for the scheme to record resource efficiency. Along with cost reductions (efficiencies), other 'good news' items were also captured, as well as KPI's (ie % recycled/ secondary aggregate used).

Evidence of resource efficiency:

- Incorporating haul road material in the embankments saved an estimated 500m³ of material being taken to tip and replaced with general imported fill materials
- Securing clay from the landfill site rather than an alternative source saved 30,000m³
- Innovative use of an Italian piling technique to stabilise an existing substandard Victorian masonry wall allowed the flood defence level to be raised by a further metre. This avoided the need for a 150m long secant piled wall with an access road cantilevered off it
- The treatment method for the cracked copings saved disposal and remanufacture of around 43m³ of copings
- An American technique for seepage control was developed. It involved sinking wells at regular centres to allow the controlled exit of seepage flows. This saved 7350m² of steel sheet piles (the traditional seepage control measure).

Resource conservation, before and after

Land Securities is responsible for the design and construction of new developments and the operation of occupied buildings, providing various points to influence the use of resources, by using less or reusing or recycling more, explains environmental director **Dave Farebrother**.

A member of the environmental department is part of every design team from the start of all construction projects and early decisions include whether to refurbish or to demolish and rebuild. Refurbishment reduces waste and the need for some virgin materials, and two recent schemes have seen this save around 1,200 tonnes of embodied CO₂ each.

We have developed a design tool that assesses both the embodied carbon and recycled content of materials, enabling designers to make informed decisions on their choice of materials and helping us achieve our target of 20% recycled content.

We have set increasing recycling targets for four years and now require contractors to reuse or recycle 90% of all demolition and construction waste, having met our 85% target last year.

After construction

We are also responsible for managing a multi-tenanted portfolio that includes 25 shopping centres and almost 50 office premises. Our waste recovery efforts began in 2002 across the retail portfolio, where we manage waste produced by the retailers and shopping public.

Initially not all centres recycled waste, and the average recovery rate across the portfolio was just 21%. Introducing a league table, thereby tapping into the natural competitiveness of centre managers, led to a doubling in the average recycling rate in just two years.

Recycling continued to rise until, in 2007, Gunwharf Quays in Portsmouth became our first centre to report zero waste to landfill – with waste that wasn't recycled being sent to an energy from waste plant. Four more centres have since matched this achievement and our portfolio average for waste to landfill currently stands at just 31%, compared to 79% in 2002.

Recycling was harder to launch for the office portfolio, where only a handful of properties practised waste management through a central option, with many tenants either doing nothing or preferring to make their own arrangements. This lost

Waste collection in 2009/10 (as at October 2009)

Portfolio	Total waste collected (tonnes)	Waste to landfill (tonnes)	Waste recycled or converted to energy from waste (tonnes)	Percentage to landfill (%)
London offices	3922.9	80.4	3842.5	2.0
Shopping centres	7665.6	2383.5	5282.1	31.1

the recovery opportunities of “bulking up”, was not cost effective and meant each site received numerous vehicle collections each week, so a single contractor was appointed to manage waste across the portfolio.

A significant tenant engagement programme was undertaken in conjunction with Nordic Recycling, to demonstrate to tenants the benefits of taking part in a single, central waste management programme. When Nordic's contract began in 2008 the average recycling rate was just 22%. A new system was introduced that saw all waste taken to a facility at Tilbury that automatically sorts recoverable waste into separate streams. On average around 55% of the waste collected is recycled. The rest goes to an energy from waste plant.

As more and more occupiers bought into the new approach the recovery rates rose until, in April 2009, we were able to announce zero waste to landfill from all sites on this contract. That still left the five sites where Mitie was our services provider, outside the waste contract, and meant that across the entire London portfolio the average recovery rate was 93%. In April 2009 new waste management procedures were introduced on these five as well, and in October this group also achieved zero waste to landfill, through a similar approach, meaning that 100% of waste from our managed office portfolio is now recovered.

These significant improvements in waste recovery have been achieved at no extra cost and in many cases costs have been reduced through improved efficiencies and savings in landfill charges.

To implement these waste recovery programmes we had to engage with, and influence, various stakeholders.

In occupied premises the challenge was, and remains, persuading occupiers that the most resource efficient and cost-effective way to manage waste is through a central landlord-managed scheme.

In shopping centres we still have considerable work to do to convince many retailers to work with us. With some it is because they already do their own thing, but for others there is a reluctance to act at all in-store, often because of storage or resourcing issues. However, even for some big chains with national waste contracts the best option, both for costs and waste recovery, is to participate in a centre-specific scheme. In December 2009 we provided every store in our portfolio with an ‘environmental wheel’ – a quick reference guide to how to approach all of their environmental aspects – and a more detailed guidance booklet.

For London, the challenge now is to go beyond waste management and work with occupiers to reduce the amount of waste generated. One way we are seeking to do this is through green Memoranda of Understanding (MOU), which we use to work with occupiers to mutually agree and bring in ways of reducing the environmental impacts of the property. MOUs lead to property-specific Environmental Management Plans that include CO₂ emissions and water as well as waste.

None of the actions taken regarding waste are particularly complicated or costly, and many save money. As such, these actions can be adopted by many other organisations as long as the commitment to change is there.

Dave Farebrother
Environmental director
Land Securities

What wood would become

Helen Porter, director of **Oxford Wood Recycling**, explains the benefits of reusing wood 'waste'.

Oxford Wood Recycling was founded in 2005 and has two simple aims: to collect, recycle and reuse as much waste wood and timber in the Oxford region as possible and to provide sustainable employment and volunteer opportunities to a wide range of people, including those who face barriers to finding or sustaining employment.

The business is fulfilling both these objectives, and growth has been sustained due to the growing number of local businesses that use the wood collection service, to people increasingly buying rescued wood materials and timber and to the hard work of staff and volunteers.

The National Community Wood Recycling Project promotes the founding of new wood recycling enterprises, and was invaluable in helping us establish. The director of NCWRP, Richard Mehmed, founded the Brighton & Hove Wood Recycling Project in 1998, which was the first community wood recycling enterprise of its type in the UK. NCWRP is aiming to increase the number of wood recycling enterprises in the country from the current figure of around 23 to 50 by the end of 2011.

Waste wood collection

The core activity of Oxford Wood Recycling is the waste wood collection service, which had over 60 regular customers during 2009. Up to 1.5t of waste wood materials including offcuts of timber, ply, chipboard, MDF, old pallets and crates can be collected at one time in our 3.5t caged tipper trucks. This is equivalent to about 70 pallets in volume.

The cost of this service compares favourably with using a mixed skip, or even a dedicated wood waste skip, as we hand load everything, meaning waste is efficiently loaded with little space lost, unlike a skip.

Up to 30% or around £4 per yd³ (excluding VAT) can be saved by using a separate wood waste collection service, according to figures supplied to us in August 2009 by the environmental manager of a large construction company.

He compared the cost of mixed waste skips on his sites with the costs of our waste wood collection service, and found the latter cost £14.30 rather than £18.72 per yd³. Regular waste wood collections also maximise



Oxford wood has been reused as a festival stage and a footbridge in the Pyrenees, a far cry from the warehouse store of rescued wood



available storage space for businesses.

Environmental benefits

Most businesses need to monitor their waste streams, and are actively trying to reduce the amount of waste they have to manage. Wood recycling can help businesses reduce the amount of waste wood they produce, because overall approximately 20% of the total waste wood collected can be cleaned, and then reused rather than recycled.

We provide full waste audits to customers, and distinguish in our data between waste wood that is recycled (clean timber that can be recycled as wood chip) and waste that is reused. This is far more environmentally friendly on several counts:

- 1) Using a local company means a smaller carbon footprint from less travel miles, and no costly reprocessing into wood chip (a low value product anyway)
- 2) End uses of wood chip may be products that are destined for landfill (eg MDF)
- 3) Reuse means that waste wood and timber continues to keep carbon locked up
- 4) Timber which can be reused is not wasted by being converted to wood chip
- 5) Waste wood not suitable for converting to wood chip (eg painted plywood or chipboard) can be reused rather than forwarded to landfill

Although we don't make wood products from this rescued wood on any large scale, customers who have bought rescued timber from the warehouse have made a range of wood products, from raised beds, compost bins, chicken coops and log stores to new kitchen units, shelving, garden sheds and workshops. We do make and sell simple



wood products though, such as compost bins, trellis and occasional garden benches.

The warehouse demonstrates the success of Oxford Wood Recycling in sorting waste wood material so that as much as possible can be saved from landfill. It is an Aladdin's Cave full of wood materials; mainly construction timber and plywood, although we often collect some unusual wood items.

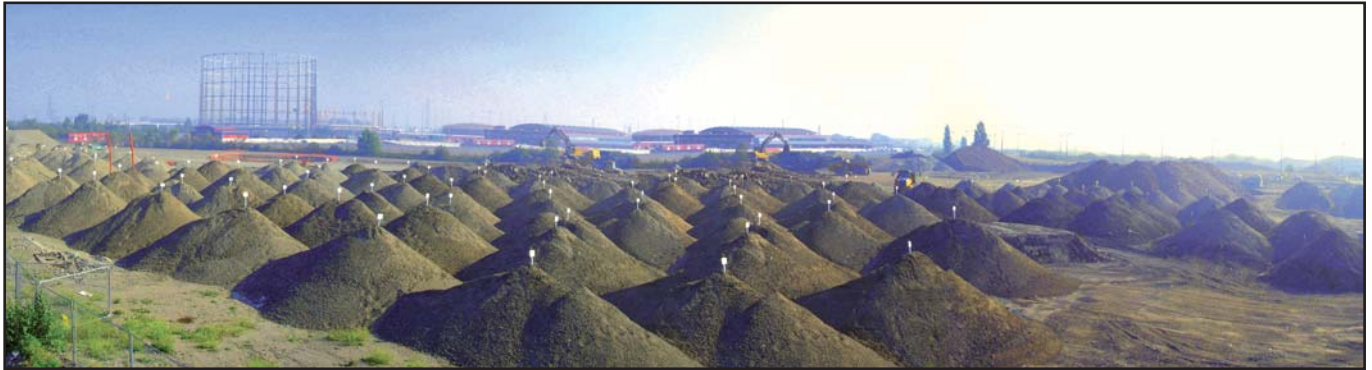
Currently, there are some robust bespoke plywood crates (used to ship valuable scientific equipment) made from tropical timber planking, some mahogany carved table legs, oak plank offcuts from a joinery and long shelves from the 'desktops' of old science lecture theatres, made from Sapele (a valuable tropical timber) and Hemlock (a North American conifer, which has very interesting and attractive figure). Recent rescued wood includes a large batch of ceiling joists from a demolished MOD building which is probably 50-60 years old, with a grain similar to pitch pine.

The 'bestsellers' at the warehouse are old scaffold boards (great for raised beds), rough studwork timbers such as 3x2 and 4x2 and shuttering plywood, which often come from hoarding put up around construction sites.

Helen Porter
Manager and founder director
Oxford Wood Recycling

Waste soils from land redevelopment

The process of waste description for surplus soils requires an understanding of a distinct regulatory and technical framework, say **James Clay** and **Rhyadd Watkins** of **Campbell Reith**.



The cost of waste soil disposal is heavily influenced by the taxation rate applied, the definition of which adds further considerations. The waste classification of soil has associated cost implications which influence the decisions made regarding the viability of remedial solutions, engineering options that affect soil volumes (such as foundations) and the overall cost plan.

The definition of waste is driven by European legislation, implemented in England and Wales by statutory instruments and supported by Environment Agency and CL:AIRE technical guidance. Waste soils are classified based on the potential hazard they present during disposal as either 'inert', 'non hazardous' or 'hazardous' (including stable non reactive hazardous waste).

Under current Environmental Protection regulations, parties transferring waste are required to describe it and ensure that it is managed, handled and disposed of properly. It is this legislation which drives the requirements for waste classification and landfill selection at the outset.

Waste Definitions

The List of Waste Regulations 2005 introduced the European Waste Catalogue, which codes each type of waste based on its source of origin and/ or composition. These are categorised as either:

Absolute Hazardous: which are considered hazardous by default

Mirror Hazardous: which may or may not be hazardous depending on the concentrations of 'dangerous substances'

Non-Hazardous: wastes that are considered to be non-hazardous by default.

The initial definition of waste is based on legislative descriptions and, at the most simplistic level, some materials are by definition 'inert' by their constituent nature and require very limited characterisation and testing.

Soils from potentially contaminated sites can, however, vary widely in their composition and sometimes include 'dangerous substances' that could in turn render them 'hazardous'. These are described as 'Mirror Entries' within the European Waste Catalogue, which provides descriptive codes for all types of wastes.

Evaluating 'Mirror Entries' is a complicated technical exercise involving the assessment of hazardous properties associated with soil chemistry. Extensive EA technical guidance exists for this purpose but it is important to recognise that, in order to be of optimum value, this requires a statistically robust data set that is 'representative' in the aggregate (with the number of samples and testing required related to the heterogeneity of those materials being considered).

Ground investigations, which are initially focused on land quality and geotechnics, will not necessarily target or provide sufficient samples on the actual soils from construction. This can restrict the data available for subsequent waste classification and generate conservatism.

WAC testing

A further level of testing is required in order for certain soils to be permitted within either inert or hazardous landfills. Waste Acceptance Criteria testing comprises

Listed 'inert' waste

Waste glass-based fibrous materials

Glass packaging

Soils and stones (excluding topsoil, peat and soil and stones from contaminated sites)

Concrete*

Bricks*

Tiles and ceramics*

Mix of concrete, bricks, tiles and ceramic*

Glass

* Construction and demolition waste with low contents of other types of materials (like metal, plastic, soil, organics, wood, rubber, etc). The origin of the waste must be known.

'compliance' level testing, primarily for the benefit of the receiving landfill. WAC tests are irrelevant if a waste soil has been already determined as non hazardous (as no relevant WAC exist for this) and are similarly not required for some inert soils. As WAC tests are relatively expensive, their relevance is an important consideration.

Contaminated land

The terms of definition associated with land affected by contamination for new development (Planning & Pollution Control: Annex 2: Development on Land Affected by Contamination) and those for contaminated land (Environmental Protection Act 1990) are principally based on determining acceptable levels of 'risk' in given scenarios. As such the hazard-based descriptions of waste classification are not directly relevant to soils retained on site (whether under an Environmental Permit or Materials Management Plan).

Notably, HMRC guidance Notice LFT

Waste Acceptance Criteria

The European Union Landfill Directive became UK law through the Landfill Regulations 2002, which:

- Banned certain wastes including tyres and liquid waste
- Categorized landfills as either hazardous, non-hazardous or inert
- Required pre-treating of most wastes prior to disposal to landfill
- Introduced Waste Acceptance Criteria
 - WAC testing for granular materials (general soils) is a two part leachate test. If a waste fails the WAC test, it is likely to be refused entry to the landfill and will need to be disposed of via an alternative route such as incineration, unless it is further treated to comply with thresholds.

1 (September 2009) also states that the description of 'inert' for environmental protection purposes is not relevant to matters of tax liability and vice versa.

The focus of ground investigations for land quality is on describing the links between sources of contamination and potential receptors and assessing risks of

particular 'Contaminants of Concern'. What should be recognised is that these appraisals do not necessarily target samples and analysis (for waste classification) from the locale of waste arisings.

In addition, some contaminants that will not present a risk in many reuse scenarios can qualify a material as hazardous: for example, some ecotoxic compounds (such as copper) can have relatively high remedial criteria and may not require remediation or removal but may be classified as hazardous waste if excavated and considered a waste. This fact could have a major bearing on the engineering and remedial options appraisal if properly costed in advance. Other contaminants such as asbestos in soils and Japanese knotweed can also introduce yet further regulatory and technical issues.

Cost implications

The most common situation which we as consultants encounter is the reliance upon land quality appraisals as a suitable basis for describing waste. This is a technically erroneous assumption.

Where it later transpires that the material

is potentially of a different waste class than initially assumed it can be too late, due to programme restrictions, to invest in further sampling, analysis and assessments. As a result the hidden cost of wastes is only belatedly realised.

The definition and classification of waste is an area that has evolved considerably over the last five years (and continues to do so with revised tax guidance anticipated during 2010). Because of its overlap with other disciplines and the associated uncertainties, it can be difficult to communicate the value of robust waste assessments during the early stages of a project.

However, due to the potential effect waste classification can have on costs and associated decision making processes, it is important that all parties involved in a construction project recognise this as a separate matter from that of land quality appraisal and one that warrants independent consideration from the outset.

James Clay
Rhydd Watkins
Campbell Reith

GET A CLEAR PICTURE OF YOUR CARBON FOOTPRINT

Find out how at the **SAP Carbon Impact Webinar**
 10.00am, Thursday 11th February 2010

- Discuss how to build a sustainable business with SAP
- View the SAP® Carbon Impact on-demand solution
- Prepare for the Carbon Reduction Commitment scheme

Register today at: www.sustainabilitywithsap.com



Construction waste... online, in time

Alex Albon of **Earth Exchange** explains how web technology has emerged, and become indispensable, as a way of solving construction waste problems via online collaborative markets.

The internet continues to evolve at exponential rates from the simple 'web 1.0' ('information out' only) websites of a few short years ago, to 'web 2.0' which embraces multi-way interaction with the internet and the use of social media, extranets, intranets, wikis and so on to enhance creativity, information sharing, and, most notably, collaboration. It is hoped that these current and future developments will also have endless possibilities for making our activities more sustainable.

The Government's *Strategy for Sustainable Construction* is an embodiment of the need to have a more sustainable built environment. A key element of the *Strategy* is the issue of cutting construction wastes. This is not surprising given that the construction industry single-handedly accounts for about a third of the UK's annual waste arisings. A massive effort, cultural shift, new ideas and methods are needed to address this issue and grasp the stark reality that we are rapidly running out of landfill space and waste makes no business sense.

In order to reduce waste we need to use less, procure more sustainably and reuse or recycle what we don't need. We can only do this by industry-wide top to bottom collaboration to create a 'market' for such materials. In any market we need to ask: "What have you got? What do you need?"

Reasons for this new service emerging:

- 1 The availability of broadband, web 2.0 technology and applications and mobile device web access makes it possible for practical online materials markets to work efficiently for the construction industry
- 2 The commercial reality of waste disposal within the construction industry now creates a demand for such services
- 3 Growing awareness across the industry of the construction waste issue, helped by things like the SWMP Regulations 2008 and WRAP's Halving Waste to Landfill commitment, means that more companies are looking to save costs and manage their wastes more efficiently, find sources of reusable materials and find sites which can use surplus arisings.

When will you have it?
When do you need it?
And where are you?"

So it is very interesting that in the last two years a brand new service for the construction industry has emerged to help resolve the construction waste problem – the online construction waste market.

There are now at least four websites exclusively dedicated to the exchange of construction-related materials and each has been developed by people with extensive backgrounds in the construction industry.

Earth Exchange® is focused on the reuse and recycling of soils and aggregates. These materials are expensive to transport and constitute the majority of construction, demolition and excavation 'wastes'. Finding sources, or users, of these materials had often been reliant on an old fashioned parochial approach using word of mouth.

The Earth Exchange® system uniquely uses virtual mapping so users can put a pin in a map for each current or future construction or demolition project they have. For each site, a list of how much, when and what types of soils and aggregates they have surplus on each of their sites and how much, when and what materials they need importing can be stated. The resultant site matches enable users to contact other sites and arrange an exchange on their mutual terms. Earth Exchange's 300 members now include some of the UK's largest civil engineering firms such as Balfour Beatty and Willmott Dixon, as well as earthworks and demolition contractors and developers – over 3,000 sites are registered online.

Earth Exchange® automatically presents haulage routes and distances for materials matches, and details of local service providers are highlighted on members' maps. These 'Associate Members' can also join Earth Exchange® and can be haulage contractors, plant hire companies, chemical and geotechnical testing laboratories or geo-environmental consultants.

Earth Exchange® is an award-winning service which has already diverted over 100,000 tonnes from landfill, saved nearly

Online construction waste exchange services

Earth Exchange®	www.earthexchange.com
Builderscrap	www.builderscrap.com
Construction Resale	www.constructionresale.co.uk
Surplus Match	www.surplus-match.co.uk



200,000t of virgin materials from being used, saved over 300,000 miles in heavy road haulage and saved over £4m for its members.

The other three notable websites focus on the myriad of other construction-related materials from the humblest light fitting or roof tile to pallets of bricks and more. Builderscrap now has some 2,000 users who can use mobile phone technology to upload details of salvaged materials or those which are no longer needed on a construction project. Some 54% of items on the Builderscrap website have been sold/reused as a result of being posted online. Construction Resale uses an eBay-style auction of surplus construction materials, and the recently launched Surplus-Match helps builders' merchants as well as construction companies find users of unwanted stock.

Users of these websites are collaborating in a way which gives them a commercial advantage over those who don't, in cutting waste, haulage costs, procuring sustainably and even realising revenue for materials otherwise destined for landfill. This reminds me of a definition of web 2.0 which I sometimes use, which sums up the rise in the online construction waste exchange market: "Web 2.0 lets users do what they want... But if you don't and a competitor does you're in trouble".

As the internet becomes increasingly widely used, the importance of web 2.0 approaches is growing. Used properly and integrated with more conventional communications media, these websites are helping architecture, engineering, construction and demolition businesses enhance their collaborative capacity in reducing construction-related waste.

Alex Albon
Operations director
Earth Exchange Ltd

Talking the talk in waste facilities

Targets to reduce the amount of waste sent to landfill are driving the development of a range of different types of waste facilities. To deliver these waste facilities successfully it is important that communications is recognised as having a key role to play, says **Hyder Consulting**.

There are a number of public sector procurement projects underway for waste infrastructure in the UK and there will be a requirement for further if we are to achieve the Government's ambitions for sustainable waste management.

Hyder Consulting has developed effective communications strategies built on the themes developed in the *Community Engagement Toolkit: Waste Infrastructure*, which we helped produce for Waste Awareness Wales, the Welsh Assembly Government, Environment Agency Wales and the Welsh Local Government Agency.

The toolkit was produced to forward the Welsh Assembly Government aims on engagement, as it stated in *Wise about Waste*: "The Assembly Government, local authorities and other public bodies need to know more about what people want. Government at all levels should consult and work with people throughout the development of waste plans/ strategies."

We are all aware that the procurement of sustainable waste management by councils is multifaceted, complex and often sensitive; in particular because waste facilities are often seen as unwanted neighbours.

To overcome potential confrontation and develop productive dialogue and cooperation, councils need to ensure that all sectors of the community have access to up-to-date, accurate information, and feel engaged and involved in the process. Public involvement should start from the beginning (planning/strategy) and should continue up to and including the statutory process, and throughout any facility's operating life. A number of initiatives can be undertaken in order to answer the public's 'big questions' to ensure that all stakeholders are informed and involved.

The 'big questions'

For the pre-procurement planning phase of a more complex project involving capital infrastructure and additional funding, councils are often required to develop an outline business case to demonstrate a clear business need for the project and to ensure

the project is affordable and deliverable. As well as these, consideration should be given to how the council will communicate the process to the community.

We believe that communications should be undertaken by in-house staff and external advisers, to ensure that there is 'buy in' from those with the responsibility of delivering the project and running it afterwards. One of our first proposals as technical advisers on public sector procurement projects is to encourage our clients to establish a communications team of officers and advisers to create a communications plan based on the three stages of the procurement route: change, procurement and solution.

The theme of 'change' identifies why a council has to amend or alter the way it handles waste. It outlines environmental and economic challenges, explaining why we cannot carry on landfilling. At this stage the messages would look at the alternative technologies available to deal with waste.

The second stage would then identify the approach the council is taking to meet this challenge by procuring the services of a partner/ contractor. This would include, for example, an explanation that it is inviting companies to bid for dealing with its waste, the method it is using to select a preferred bidder and the timescale it proposes.

The 'solution' section of the procurement stage would inform stakeholders what has been decided, how it will be delivered and the benefits it will bring. But it doesn't stop here; communications should go on to keep the public informed of how the solution is working, and of any changes or successes.

This three stage communications strategy enables the procurement of a new waste treatment facility to be an 'open book' process. Effective communication is key to supporting change and easing any possible opposition, or misconceptions about new waste infrastructure.

Another important role for the communications plan is the marketing role it can play by ensuring that companies are kept interested in the tender process, therefore increasing competition.

The communications plan from the outset should be detailed and comprehensive and include why it is required during the procurement process. Aims could be:

- To ensure that as many people as possible are informed about the procurement process
- To ensure that people are educated about waste treatment facilities, to dispel any negative myths about the technologies
- To identify the key stakeholders and audiences that will be targeted (statutory consultees, strategic stakeholders and community stakeholders).

Accurate identification of individual groups will underpin the successful development of the campaign. So a key action would be to establish a database of individuals and organisations that make up the opinion formers and representative communities in the relevant area. In addition, communication channels would need to be carefully selected to ensure that all the stakeholders identified are addressed.

The plan should provide details on the role of public relations in the campaign, along with a recognisable identity and consistent approach to design, use of language and so on.

It also needs to outline how it will be monitored and evaluated against set criteria, so that the council can demonstrate a return on the time and money invested.

The development of such communication plans can provide a number of benefits. It is important to remember, however, that any plan needs to be able to be tailored to different stakeholder types and needs.

There is no doubt that the supply and distribution of information plus the structured use of consultation techniques to inform and engage staff and public of the progress of a project can reduce problems and conflict later on. Early consultation on sites and planning is key to reducing the delays created by opposition and public enquiries. An effective and well planned communications strategy will assist in delivering a successful procurement project.

Hyder Consulting

FUTURESOURCE

Europe's sustainability event



£6.85 billion

That's the total spending power of Futuresource 2009 visitors on products and services

**Want some of that to come your way?
Book your stand for Futuresource 2010 now.**

Contact our sales team:
T: +44 (0)1604 620426
E: sales@ciwm.co.uk

[Learn more about our visitors online](#)

www.futuresourceuk.com

15-17 June 2010, ExCeL, London