



Ask the fellows...

...why they waste so much
...and what we did when they told us



Preface

The construction industry has a poor reputation on environmental matters. The general perception is that building projects desecrate the environment, waste huge amounts of resources, and bulldoze their way through the sensitivities of those who care for the long-term welfare of the planet.

Yet despite mounting pressures on the industry to mend its ways – the rising costs of landfill and waste disposal, an increasing legislative burden, and greater levels of public concern about the environment – the issue of sustainability has only recently started to feature in construction thinking. And although sustainability is rising up the agenda for large firms at the top end of the industry, the *SME-environment 2003* report by WS Atkins (for NetRegs) says there is practically no engagement with smaller firms – which make up more than 90% of the construction sector.

Kotuku is a non-profit distributing environmental organisation, founded in December 2001. Our mission is to promote sustainable resource management in the construction industry through research, education and demonstration. We believe the sustainability agenda is an opportunity to develop new levels of environmental responsibility on construction projects, to the benefit of all involved – from client, professional and contractor, to supplier, community and environment. With this in mind, we focus our attention on the smaller firms, with a specific aim of reducing the 13 million tonnes of building products delivered to site and sent away unused.

The 'Ask the fellows...' project was devised to determine a realistic and practical action program to address sustainability issues. Our starting point was to establish out why high waste and resource inefficiency appear endemic in the construction industry, particularly among small and medium-sized firms (SME's).

It is not a new question, and we are not the first to ask it; so our challenge was to contribute a new perspective to the debate.

We took our inspiration from the pioneer of oral history in England, George Ewart Evans, and his seminal work *Ask the Fellows Who Cut the Hay* (first published in 1956 by Faber and Faber).

Oral history can be defined as the recording, preservation and interpretation of historical information, based on the personal experiences and opinions of the speaker. Evans collected memories of life and work in Suffolk villages, where he commented that the people he interviewed were like 'walking books'. In similar vein, we said the best way to find out what goes on in the Construction Industry, is to ask the people who are doing the work.

We also took the opportunity to ask people what they knew about existing initiatives promoting sustainability in construction, in particular the introduction and use of reused and recycled materials.

The picture that emerged as the project progressed was not just an all-round lack of awareness on environmental matters, but the lack of any relevant apparatus to address this problem. We found that SME's are concerned about the environment, but they are too busy carrying out their day-to-day business to take time out to improve their knowledge and understanding; so conventional forms of information distribution by-pass the very people who need it most.

This is a sorry state of affairs, and we were determined not to produce another report that would sit gathering dust on the shelf of a well-intentioned social enterprise. So we set out to find a way of taking environmental awareness to SME's that would balance the day-to-day needs of the organisation with the opportunity to stop and take on new ideas.

The result was the highly successful 'Cafe Van'– an approach to raising environmental awareness that takes the message direct to building sites, and minimises disruption to the working day by presenting during the obligatory 'builders' tea break'.

This report summarises key findings of this two-in-one project, so that everyone involved in the construction industry can benefit from the insight we have gained.

You'll be amazed at what a quick chat over a cup of tea can achieve!

Acknowledgements

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Andrew Pears

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Introduction

Sustainable construction has been the subject of debate, research, academic endeavour and government interest for a number of years. Much of the discussion has concerned the sustainability of what goes into the built environment and the effect on the planet of how buildings are used. It is only relatively recently; with the realisation that landfill space is a finite resource, that attention has turned to what comes out of the built environment – in the form of waste generated during the construction process.

Some of the broader concepts contained under the umbrella of sustainability, for example, carbon emissions, need to be debated at national and global levels. But Construction waste has important local consequences and therefore can be studied and tackled at a local level. (In London, for instance, the construction industry sends to landfill twice the entire municipal waste stream^[1].)

In a typical year, the UK construction industry takes some 420 million tonnes of raw materials and 8 million tonnes of fossil energy, and uses these to add around 270 million tonnes of stock to the built environment^[2]. The difference is lost as waste. This amounts to nearly 3 tonnes of waste for each man, woman and child in the UK.

Even worse, 13 million tonnes of building materials that are delivered to site are sent away unused^[3]!

No member of a responsible society can look at such figures without a degree of incredulity and want to ask – is this sustainable?

Even if, for a moment, we disregard the environmental costs of disposing of the waste, and of needlessly transporting unwanted materials to and from the nation's building sites, this volume of waste would be a travesty because, in the final analysis, someone is paying for it... And that someone is the client. Over decades, this wasteful behaviour has become embedded in the construction process, and the true cost is hidden because it is simply passed on in the bills for the work.

At Kotuku, coming from a construction background, we understand that it's not easy to change the habits of a lifetime.

Building projects require the coordinated input of a wide variety of people including clients, architects, builders, sub contractors, and product suppliers. All are working to a similar overall agenda, which is driven by cost, time, and quality. But the people 'at the coal-face' – the builders – have other issues to tackle including health and safety, hiring and firing labour, grappling with legislation and regulations, quality control, and cash flow.

Balancing all these elements is not a new challenge – it is in the nature of the construction industry – but it requires skill and has many risks. For small to medium-size enterprises (SME's), which make up around 90% of the industry, this is a very tall order. The industry works on low margins, and is typically responsible for around 12% of all business bankruptcies^[4]. And for smaller firms, where finance is often obtained against personal loans and guarantees the consequences of mishandling these risks is devastating. (Not that these difficulties are limited to SME's, the widely reported loss of at least £160 million by the contractor on the Wembley Stadium is a local example.)

Against such a background it is not surprising that environmental issues have a low priority. And while there is often recognition of 'immediate' environmental issues – noise, dust, water, traffic – the issues of waste management and resource efficiency are simply not seen as a problem.

So, we set ourselves a challenge to find out why waste and resource inefficiency are endemic in the construction industry, particularly among SME's.

Taking our inspiration from the pioneer of oral history in England, George Ewart Evans, and his seminal work *Ask the Fellows Who Cut the Hay* (first published in 1956 by Faber and Faber), we decided to get out onto sites and talk to the people who are at the sharp end of the construction waste problem.

But of course we realised that finding out 'why' was only half a challenge – the other half would be to find a way to change this culture and improve the sustainability credentials of the industry.

The projects were linked because:

- the evidence from 'Ask the fellows...' determined the current state of affairs and defined the issues we had to address
- the process of setting up the interviews and focus groups gave direct experience of the equally important issue of how to engage with smaller construction firms in the first place
- Out of these findings came the Cafe Van, a response to the challenge of how to engage with smaller firms

To summarise:

- We got on our bikes
- We asked the fellows...
- Then we gave them tea and talks.

Project timescale

November 2003	'Ask the fellows...' started
Spring 2004	Gathering of Borough information
Summer 2004	Focus groups and interviews
Autumn 2004	Interim report; development of Cafe Van
Spring 2005	Cafe Van funding in place
Summer 2005	Setting up Cafe Van
Autumn 2005 – Summer 2006	Cafe Van Presentations

This report is divided into:

- Section 1, which describes the 'Ask the fellows...' project, and summarises and discusses the results*
- Section 2, which describes the 'Cafe Van' project and the potential impact for subsequent projects.

(* Please note that the comments made by operatives who took part in the Cafe Van project have helped to inform the overall conclusions of both projects.)

This report will be of interest to anyone who is working towards reducing construction waste and inefficiency, and – significantly for construction professionals and firms – increasing profitability. It will be of particular interest to the various departments, agencies and environmental organisations that have waste minimisation on their agendas – especially local authorities, who are seeking ways to reduce the amount of materials sent to landfill.

Over the duration of these projects we gathered a large amount of fascinating anecdotal evidence, which can only be summarised here. More detailed information on the projects is available on our website – www.kotuku.org or by contacting us direct – andrew@kotuku.org.

Section 1 – Ask the fellows...

1.1 Project design

Kotuku is a London-based organisation which aims to minimise the environmental impact of its projects. When devising the 'Ask the fellows...' project, we wanted to reduce wasteful travel, so we decided to work in our own back yard giving the project a London focus. However the site-related issues we encountered are relevant to building sites across the country.

As estimates suggest that some 20% of the construction output of the entire country takes place within Greater London, and there are over 17,600 construction companies working or based in London^[5], the task was not how to gather sufficient information, but how not to be overwhelmed by it in a relatively small project.

We restricted our initial research to building projects in four London boroughs:

- Lambeth
- Wandsworth
- Kensington & Chelsea
- Hammersmith & Fulham.

Table 1 summarises the construction activity in these boroughs.

Table 1: Construction companies

Size of building firm	1	2 – 3	4 – 7	8 – 13	14 – 24	25 +	TOTAL
Hammersmith & Fulham	113	57	28	12	10	8	228
Kensington & Chelsea	89	42	27	8	8		174
Lambeth	176	96	37	17	10	12	348
Wandsworth	229	132	58	28	24	10	481
Greater London	8,961	4,820	2,136	725	484	501	17,627

Source: DTI, May 2002

In keeping with our objective of providing a new perspective to this debate we took an innovative approach to establishing the levels of building activity in the boroughs.

We wanted an up-to-date database from which to select potential survey respondents and to give us direct information on levels of building activity and waste production. But we needed to overcome two problems:

- Firstly, statistics produced by government and local authorities are historic and rely on reporting returns submitted by building companies and projects registered with the local building control department. The fragmented nature of the industry and the large number of small firms mean that many projects are not counted and information is out of date by the time it is available.
- Secondly, the only statistics for borough construction waste outputs are from the local waste transfer stations, and they bear no relation to the actual output most of which is disposed of outside the boroughs.

Our answer was to cycle down every street in the four boroughs logging all the recognisable building sites, their waste management systems, and taking details of the companies involved on the sites. This 450 mile journey became a fascinating exploration of the diversity of buildings and life in London. With such an approach, the project focus became determined by the types of construction activity we found.

1.1.1 Which sites were relevant?

Our assessment and subsequent research covered all types of construction – from new build to refurbishment, public to private sector, and domestic to commercial. However, because we were particularly aiming to engage SME's, the sites we dealt with were typically:

- refurbishment of existing buildings
- suitable size to be recognisable from the road
- works to residential properties.

We did not include:

- small repair works
- works to the highways and utilities
- large scale new build contracts.

1.1.2 Who did we ask?

Those who undertake building project know they require the skilled coordination of a wide range people; professionals including planners, building control, Architects, Quantity Surveyors; and building specialists including builders (employing a variety of trades), sub-contractors, products suppliers, and skip-hire companies. We set out to talk to members of each part of this chain, and to gather and understand their opinions on resource efficiency and sustainability.

The discussions were undertaken by a specialist market research organisation The Insight Business.

Most of the people who participated in this exercise were identified during our cycle around the boroughs. However, The Insight Business had difficulties contacting people in some specific roles (site managers, for example) and therefore they conducted a number of additional interviews (see Appendix 2).^{*} In summary we talked to:

- 13 architects
- 18 builders
- 4 quantity surveyors
- 5 suppliers (builders' merchants)
- 3 skip hire companies
- 4 clients.

In addition, over 300 construction personnel took part in the Cafe Van exercise, and their comments also informed the results that are described below.

1.1.3 What did we ask?

The Insight Business developed a discussion strategy based on the following core themes:

- Why do practitioners in the construction sector waste so much material?
- How do people in the building industry view recycled and recovered materials?

^{*} Their methodology is discussed in their full project report available from Andrew@kotuku.org

We also asked our interviewees to suggest:

- What would need to happen in order for the attitudes and behaviours creating current waste levels to change?
- What would need to happen for more recycled and recovered materials to be specified and used?

The overall approach was highly qualitative based on group discussions, face-to-face interviews and telephone interviews.

An informal and flexible topic guide was used to direct the flow of the discussions and interviews, so that people revealed the areas in which they had sound experience and firm views. At the heart of the discussion guide was an examination of the roles of various stakeholders in a project and a 'walk through' of the construction lifecycle from client brief, through design, planning, tender, contract and execution.

1.2 Results and discussion

1.2.1 The view from the saddle

Scrutinising every street of four London boroughs was an opportunity to make some fascinating observations.

As we cycled around the boroughs we noted that, within the existing housing stock, the quality of a building is not reflected in its value. There are terraces of beautifully worked buildings with views over London that are worth a fraction of their mundane rivals in the centre of town. However, these buildings are united in their traditional construction (brickwork, carpentry, and plasterwork) which make their maintenance and refurbishment potentially sustainable. On the other hand, many new buildings utilise materials such as glass, concrete, steel, plastics and composites, which present greater long-term maintenance and refurbishment issues.

While the innate problems of urban building work – pressure on space, difficulty of access and parking, narrow streets, proximity of the general public – are common to all boroughs, the range of properties (detached, semi-detached, terraced, low rise, high rise, council estates, private estates), the wide variety of ethnic backgrounds, and the obvious social and economic mix produces an ever-changing building landscape.

We observed areas where every house seemed to be in the process of refurbishment or loft conversion, and areas of similar housing where no work was happening at all. Major investment in upgrading estates was obvious in Lambeth creating acres of scaffolding, while the value of private housing in Kensington is so great that all projects appeared to be conducted with surgical precision to minimise disruption to neighbours.

The major surprise was the number of building projects (over 1,000 in the four boroughs), and the amount of skips on the highway – more than 600. There were many areas where parking or restricted access made the use of skips impossible. Although skips are only one way in which the construction industry handles waste, from our observations the tonnage of waste removed in skips from the four boroughs per week is greater than the entire weekly municipal household waste tonnage. Our survey was conducted in February when building output is low, so this figure may be regarded as conservative.

Table 2 is a summary of the information we collected.

Table 2

	No of skips	No of sites	Population
Lambeth	128	217	266,169
Wandsworth	204	299	260,380
Hammersmith & Fulham	188	296	165,242
Kensington & Chelsea	81	214	158,919
	601	1,026	

Property ownership

There are large estates in all the boroughs. Some are owned by the local authority and undergoing extensive refurbishment. Others are dramatic new riverside private developments.

There are clearly resource efficiencies to be had on projects that are building or upgrading a large number of identical flats. But from our observations, these large estate projects appeared to produce even more waste, perhaps because it is a smaller percentage of the value of the contract or the completed project.

The greater the value of the property – and this is particularly the case in Kensington & Chelsea – the less interest there appeared to be in environment issues. On one completed project a house sat fully heated (including an indoor and outdoor pool) with all electric equipment running 24 hours a day even though the owner used it only two months of the year.

Site recognition

It is reasonable to assume, given commercial sensitivities and local authority licensing requirements, that scaffolds and hoardings on all sites would clearly display names of the contractors and professionals engaged on them. We were surprised at how many sites had no form of identification.

The constant exception was the loft and basement conversion industry, who confirm their presence with large and unavoidable signs. These companies usually operate in a different environment from traditional building.

Rather than being part of an extensive chain, loft and basement conversion companies market direct to clients and provide all the building services in one organisation. Such an approach seems to give a much greater sense of responsibility and accountability to these firms. They are much more aware of the benefits of good project planning, management and resource efficiency as it has a direct effect on their business success.

Signage was also absent from sites that are operating within the 'informal economy'. While some sites may not want to be recognised because of their unpleasant impact on the local environment, it was also clear that many wished to remain below the gaze of the taxman and others - the latest DTI figures for construction value contractor's output at £70 billion and the informal economy at £10 billion, or 12.5%^[4] This is a serious figure, and should not be ignored by any campaign addressing the industry.

A private London builders' merchant said 30% of his business was in cash over the counter from builders in the ubiquitous unmarked white van.

Skips

A local authority permit is needed if skips are to be placed on the highway. The permit requires that the owner of the skip is identified, and that the skip is lit at night, and covered when not in use.

The large majority of skips were unlit and uncovered, and many had no identification on them.

Skips placed on designated parking areas pay a daily rate for the suspension of the parking bay. This can be up to £40 a day. When this issue was discussed with contractors, we were told there are many such suspensions, all of which adds to the already high cost of waste disposal on construction projects.

- All the skips we saw contained mixed waste, even when it would have been easy to only fill them with inert waste. This meant they attracted the non-hazardous rate of Landfill tax of £18.00 per tonne (£21.00 per tonne from April 2006) rather than the inert rate of £2.00 per tonne.
- A high proportion of skips contained pallets – these are bulky and have easy reuse potential.

Numerous sites managed their waste by loading it into builders' vehicles. (It would be interesting to find how many had a licence to handle waste.)

Despite the many traffic wardens seen enforcing parking regulations, no warden was ever seen checking on skip licences or highway compliance.

Utilities

We did not monitor or interview civil engineering and utilities work in the boroughs. But it is worth recording that there is substantial infrastructure work in progress and that the visible waste on such projects in terms of unused and damaged materials, and use of virgin rather than recycled aggregates, appeared greater than in any other type of construction work.

Waste sites

We observed that railway land seems to be regarded as an alternative municipal waste ground that attracted fly tipping and litter in a depressingly predictable fashion.

The placing of waste transfer stations in the boroughs is essential for prudent waste management. However the value of land is so high that new housing developments are springing up on any piece of vacant land. For example, in Wandsworth, the Smugglers Way transfer station is surrounded by new up-market riverside developments and will be interesting to see how long commerce and residents can mix in harmony. There is already local opposition to a proposed materials recycling facility (MRF) on the Smugglers Way site.

Ethnic spread

A survey of part of London cannot ignore the diverse ethnic spread of a city whose school children speak over 300 languages. Moving through the boroughs it was clear how areas become populated by particular ethnic groups, and how they impact on the levels and types of construction.

It is very easy to assume from the building trade press and the focus of the environment movement that the only people who build are white and middle class. Any realistic campaign on resource efficiency must find ways of engaging with the full London audience.

1.2.2 What they told us about waste

Clients

A domestic client commissions building work to provide more space, to repair worn out parts of the building, or to upgrade and modernise. The key priorities are cost, project duration and quality of work. Their advisors, and the fashions that drive such work, concentrate on style and delivery.

Refurbishment is a complex construction process. Often the detailed scope of work cannot be fully known until the project has started, and the design brief can change due to physical circumstances and revised client requirements. The disruption to the project, waste of resources, and the environmental impact that are endemic to such an approach are not questioned.

- There is rarely communication on the environmental impact of the works, or of the material being used, because these issues do not appear on the standard construction agenda.
- The clients interviewed had not actively raised such issues with their architects or contractors.
- However, if these issues are understood they are seen as a small and acceptable cost to a project that may be adding far more to the value of the premises than the charge for the works.
- When the client does want to take a genuine interest in environmental matters they will find the industry unprepared. Specialist advisors and suppliers are hard to find, and many of the materials – for example lime mortars, clay paints, sheep's wool insulation – are more expensive to purchase and take longer to install.

As the instigators of the building project and the person or body for whom the work is carried out the client should be key to much of what happens in the lifecycle of a building project. Our study indicates, however, that domestic clients (who form by far the largest group in at least two of the four boroughs) are not engaged in the related issues of sustainability and waste in the context of their own construction project.

- There is evidence that some professional clients such as local authorities, housing associations and property developers have incorporated sustainability into their outlook.
- Where there is a concern for sustainability among client bodies, however, it manifests itself more at the level of the energy performance and resource efficiency of the finished building and the use of material from renewable resources rather than minimisation of waste in the construction process.

While there is no immediately obvious line of influence between professional client bodies and domestic customers, the demands made by environmentally conscious professional clients will undoubtedly raise awareness of sustainability issues among architects and contractors and, in the long term, alter practice in the industry for the better.

'When clients talk about sustainability they are talking about saving money rather than any sort of environmental concern. They'll be looking, for example, to ways of construction which will minimize the amount of air conditioning you will need and maximize natural thermal effects in the building so you've got less air conditioning equipment and less power to run it.' [Architect]

Architects and surveyors

- Architects are driven by the goal of good design. They are attracted to the profession by a creative impulse rather than a social one, and see their role to design things of function and beauty.
- They are taught sustainability issues at college, but rarely find a framework for practically implementing the agenda once they leave.
- Architects may consider building performance and renewable resource aspects of sustainable construction, but they see the practicalities of construction, including waste management, as an issue for the main contractor.
- They, like all professionals, have a limited amount of time to spend on project. Coping with current regulations is hard enough, and they are unwilling to speculatively widen their remit.
- They can rarely call on more resource efficient forms of building like prefabrication
- Architects find no call for such matters from clients. When the client sets an environmental brief the architect will respond, but they will not drive it.
- Most building projects work under tight time constraints. The pressure to start often means works are designed as they proceed. Architects do not always realise how difficult this can make efficient project planning – a key element of resource efficiency.
- Architects find adopting non-standard methods and new ideas can be time-consuming, and there is no additional payment for such works under their fee structure.

Builders and sub-contractors

The good news is that pride in the efficient use of materials is common to many skilled builders, and no one likes to see usable supplies thrown away. A good example is waste lead, which never reaches a skip because there is a ready cash market for it.

However, the culture of dumping thousands of tonnes of waste is deeply ingrained in the systems and work practices of the industry because historically it reduces risk – as the following ‘explanations’ indicate:

- **health and safety** – materials left on site are hazards
- **contract period** – a clear site allows work to progress
- **site progress** – running out of material is commercial disaster, over ordering is safer
- **cost** – the labour cost of running out of materials is far higher than the cost of materials
- **special orders** – some materials have a long order period and provision has to be made for damage or wrong delivery
- **sub-contractors** – will counter-charge if they do not have materials to work with and may not have time to complete the work
- **quality** – keeping the site uncluttered allows for better work and pleases customers and managers
- **new and unfamiliar materials** – attract greater level of waste as there is a learning curve in their use
- **good management** – small building is an inexact science and a good builder is expected to build in contingency for the unforeseen
- **packaging** – (which can account for up to 30% of all construction waste) is unavoidable and the contractual responsibility for all site packing is placed on the builder.

The construction industry is based round sub-contracting. By giving packages of work to specialists the main contractor passes on the risk of cost, delivery and quality to others. (The same is true of waste management which is sub-contracted to skip and waste companies.)

There is a correlation between firms that try to maintain a high proportion of in-house trades and labour, and those who claim to be able to control wastage on site through the application of basic quality processes and the motivation of well-managed, loyal staff.

One medium-sized construction firm has a policy of requiring its preferred sub-contractors to participate in its corporate training program.

The builders we interviewed suggested that, with all the other issues on their plate, there is little concern about what happens to their waste once it has left site.

These issues are compounded by the problems of working in the inner city. Space is always at a premium and, with expensive parking restrictions, the builders focus is to get rid of waste before it uses up too much site space.

Few builders now have a yard or stores because the cost land is so high. While in the past unused materials might have been stored it is now cheaper to throw them away. Where they are stored this tends to be a holding point for a number of years until they are then thrown away. (An East London builder founded over 100 years ago still has shelves of ironmongery and plumbing returned to the stores 60 years ago!)

There are also problems within the workforce:

- attitudes to responsibility are low and lead to careless handling of materials
- agency workers are cheaper than employees, but have no interest in reducing costs or caring for resources
- the demise of apprenticeship schemes contributes to less training and careless attitudes of younger trades
- the demise of the traditional trade foreman who would set and enforce standards on site
- materials are often ordered from site by tradesmen who have little skill or knowledge of purchasing.

Comments from interviewees also suggest that the lack of any alternative marketplace for construction waste (apart from skip companies) is a barrier to improving resource efficiency.

Materials suppliers

The survey found no evidence that the building products industry is addressing issues of sustainability, waste and energy use at the point of delivery. (This is in contrast with the point of manufacture where the construction products association sets KPIs on resource efficiency and energy use.) Indeed the situation has become worse in recent years:

- The system of returning and reusing dumpy bags and pallets has stopped. (However when such reuse was the norm the collection system was operated by a different vehicle from the delivery system thus negating the opportunity for efficient use of transport.)
- The quantity of packaging has greatly increased:
- manufacturers distinguish their products
- greater protection of new materials

- The *Manual Handling Operations Regulations 1992* reducing the size of cement and plaster bags
- pallet use for even the smallest orders to speed delivery
- Sale or return has ended. The problems of restocking unwanted or left over materials do not fit in with central invoicing and stock control.
- Minimum order size means it is more difficult to buy small quantities.
- The local builders' merchant is part of history. The consolidation of the builders' merchants industry across the country has seen the demise of most independent outlets and the rising dominance of a few national names. Market share and shareholder profitability is driven by sales.
- The decline of the builder's yard and store has opened commercial opportunities to the merchants. To their credit they have responded by offering wider product ranges and better delivery, but this is at an environmental cost.
- The problems of operating a delivery service are always increasing. The cost of local transport, the Congestion Charge, the confrontational attitude taken by parking wardens and the difficulty of recruiting and retaining delivery drivers has a critical impact on the ability of merchants to address waste minimisation and remain profitable.
- A raft of environmental legislation has been applied to builders' merchants (in their view) in a confrontational rather than an inclusive way which has potentially impaired levels of cooperation.

'Builders don't know how to handle materials. If they haven't had to pay for them they couldn't give a XXXX.' [Merchant]

Waste management industry

Skip hire and waste management companies have little incentive to promote and improve resource efficiency:

- waste is their business; more waste means more business
- all addition charges including landfill tax are passed direct to the builder
- many are small owner operators who rely on the services of waste transfer stations
- planning permission for waste facilities is very hard to obtain hampering the development of new, improved facilities
- the market for segregated waste is volatile making investment in processing capacity risky
- lack of site space and the cost of skip licenses and parking bay suspension fees means there is little demand for separate skips for segregation.

The fundamental issue to arise from the skip hire company interviews, however, is that at current levels the Landfill Tax makes it highly profitable for them to

segregate and compact rubbish at their own transfer stations and they are therefore unlikely to get behind initiatives to encourage builders to behave differently.

Skip companies generally offer one type of general waste skip to builders. They do not, unless specially asked, offer skips at a lower cost when the waste can be certified inert, and do not offer any form of segregation service on smaller sites.

We were constantly surprised at the low level of adherence to the requirements of duty of care. Waste transfer notes were often not available or would categorise a skip of mixed builders waste as 'muck away'. Small sites would hand their waste to mobile rubbish services that left no documentation, and few understood the importance of segregating hazardous waste.

The skip company interviews cast a pessimistic shadow on the potential for on-site segregation of building site rubbish.

One waste contractor had lost three customers to a competitor because he would not offer discounted skip prices for segregated rubbish. All three customers had come back having found they were unable to meet the segregation criteria for the other contractor.

Another firm had worked on five sites where the contractors had been offered special deals for segregated waste (for example, no charge for a skip with 100% timber backed by a £1,000 penalty for contamination). Four of the five instances had been failures and the fifth had experienced major teething troubles.

Local Authorities

The principal point of contact between the local authority and a working building site is the Building Control Officer. Their role is to monitor and enforce compliance with the Building Regulations. They have a full knowledge of the industry, and an ability to communicate with those working on site.

We talked with the heads of two Building Control Departments, one of whom came out with the very quotable observation:

'We would be rather pleased if the builders would lay the bricks in a straight line before we worry about how many bricks they are wasting.' [Building Control Officer]

At a personal level they felt very committed to sustainability, but their departments have budgets and targets, and while they agree that their inspectors are often the most qualified person that visits a small site, they do not have the resources to take on additional workload, or the desire to take on further responsibility. Resource efficiency and waste management is a contractual issue for others in the project.

In Hammersmith, for example, the environmental agenda is undermined by the fact that it is nobody's specific responsibility. The main internal clients – Housing and Education – see it as the responsibility of Building Technical Services to drive any environmental aspects of construction, whereas Building Technical Services, who are already hard pressed, expect their internal clients to specify environmental aspects if it is important to them. Contractors are required to submit method and process plans. These contain some references to sustainability and the treatment of waste. But they are not considered priorities and tender awards are unlikely to be based on these aspects.

1.2.3 What they told us about recycled materials

It will be no surprise that the response to this question was driven by the attitudes and understanding revealed in earlier questions. However, the recycling and reuse starting point of the construction industry is less bleak than might be thought, driven by an economic agenda:

- Architectural salvage supplies a large range of reused building components.
- The listing of buildings encourages repair rather than replacement of all building components.
- Hardcore is reused on many building projects to save transport and disposal costs.
- The demolition industry sees every project as a resource opportunity recycling up to 80% of its output.
- There is a large market for second hand bricks and Yorkstone paving. (A recent delivery to a London site was found to contain old tombstones which may be taking the principal too far).
- The influx of labour from Eastern European countries, where labour is cheap and materials expensive, has introduced a new culture of resource efficiency.
- Many materials – glass, lightweight blocks, plasterboard, chipboard, carpet underlay, and packaging – have a high recycled content.

Architects say they do not have readily available information on recycled products, but some younger architects and architectural assistants would like to specify green products, if only they had time to do the research...

'[Time] ...is pretty important at my level, not being a partner or a director. If I'm given a task – say, to get out a tender package – I have a certain time limit and I'm expected to get the package out at the end of the day on the deadline. Not having as much experience as other people here I would have to go and resource everything, research, put the extra effort in and then ultimately may not meet the deadline, so it's not always feasible to do those things at certain stages.' [Part 3 Architectural Assistant]

1.2.4 What they said we should do about waste

Clients

- The greatest priority is to raise the level of understanding about the construction process and its environmental consequences.
- Accompanied by provable assurances that the debate is credible, not some gimmick by an industry that ranks low in the esteem of the general public, and that the construction industry has the resources and commitment to deliver.
- There needs to be products and processes that are at least as good as the traditional approach (The National Green Specification is an example) and if the agenda is to have cost implications, it must demonstrate added value.
- A ban on all TV makeover programs that do not carry out an environmental audit of their projects would also help, but may be less realistic than suggestions above!

Architects and surveyors

To work, resource efficiency needs embracing by all members of the construction chain. As the lead figure the Architect has a pivotal role in determining the ethos of a building project and its enactment. (A recent visit to the Eden Project showed how the adoption of the environmental agenda as a key driver of the project only became reality through the support and commitment of all parties.)

- The environmental agenda is an opportunity for architects to demonstrate a new level of social responsibility. This is already happening in the larger practices where clients are taking keen interest in the lifetime costs of their projects.
- The new Part L of the Building Regulation will force architects to design with a greater concern for resource efficiency and, given the sustainability syllabus being taught at colleges, it will make poor commercial sense for architects to ignore environmental issues any longer.
- As all professional bodies require a commitment to continued development as a condition of membership, the inclusion of a sustainable agenda in the RIBA program would be helpful.

Builders and sub-contractors

We have remarked on the clear interest taken by builders once they were introduced to the concept of resource efficiency; but we were constantly surprised at the low level of knowledge and awareness on environment issues.

- A responsible and realistic education campaign must be central to any initiative to change the current culture.
- If there was an accessible alternative to skips as a method of waste management it would be received with great interest.

Materials suppliers

The key drivers of this industry are sales and market share. If the environmental agenda can be matched to these criteria it will seamlessly integrate with current practice. For example, one national merchant now offers a complete range of timber from Forestry Stewardship Council (FSC) registered sources; such a choice would have been impossible a few years ago.

- The customers must start voting with their business. If clients demand pallet take back schemes, products with environmental credibility, plasterboard collection and a realistic restocking service the industry will respond.

Waste management industry

- The waste management industry is very sceptical about the Construction Industry's ability to quality manage new systems.
- Waste segregation initiatives rarely meet quality control standards as waste streams are contaminated by mixing
- No one wants to pay for the greater supervision required
- While builders charge waste costs direct to clients there is no incentive to improve waste management

Coordinating waste strategies

Construction and demolition (C&D) in Greater London produces over 14.2 million tonnes of waste annually of which 10.4 million tonnes is recycled and 3.9 million tonnes is sent to landfill. This contrasts with the municipal waste stream, which produced 4.339 million tonnes in 2003-4 (of which 3.326 million tonnes was from household sources), and of which 3.02 million tonnes is sent to landfill each year.

Our findings also suggest that there should be some synergy between campaigns to reduce municipal waste, and campaigns on commercial waste. A skip on the highway is a highly visible reminder of the inherent waste levels of construction, and our observations reinforced the view that large quantities of reusable materials are discarded into skips on a daily basis.

This cannot make sense in boroughs where major initiatives are taking place for municipal waste. The general public need to see a consistency of approach that regards waste as waste (or resources) whoever produces it.

The London Wider Waste Strategy ^[6] recommends, wherever feasible, that municipal and commercial and industrial waste should use the same waste collection vehicles and management facilities improve levels of recycling.

1.2.5 What they said about increasing the use of recycled materials

When it comes to recycled materials, the industry is labouring under a number of prejudices:

- **Economics** – Such materials are seen to be more expensive to purchase; they take expensive time to research; they are more difficult to resource and come from specialist suppliers who do not offer normal trade terms; they are more costly to use compared to tried and tested methods.
- **Risk** – They are perceived to be of lower standard, or with a greater potential to go wrong. A good example is lime plaster, which takes less energy to manufacture than gypsum plaster, and is often more suitable for older buildings, but on the negative side the mixing and preparation is time consuming, has additional health hazards, and the failure rate of the process is much higher.
- **Education** – Clients, architects, builders, and builders' merchants have little knowledge of the availability of environmentally friendly products. No respondent had heard of the National Green Specification.
- **Suppliers** – Builders are very conservative in their procurement patterns and buy from a regular number of outlets. There is good sense behind this approach. They can negotiate discounts, accounts are paid monthly, and the merchants are more likely to help out established customers when there are problems. If recycled products are only accessible through specialist outlets they will never achieve great market penetration.

Most people in our survey said they would view increased use of recycled and recovered materials favourably, subject to the issues raised above:

- **Economics** – No additional cost to the contract or a recognised allowance for the additional cost; fee-based professionals paid for the extra time researching materials; builders paid for extra time using new or untried techniques.
- **Risk** – The performance of the products being at least as good if not better than standard product, and this performance being supported by the British Board of Agrément (BBA) or BSI certification and manufacturers' guarantees.
- **Product information** – The construction materials industry needs to take a lead in giving accurate and reliable information about what is supplied.

1.3 Summary

Every industry develops unique patterns and systems of work. The range of responses we received to the question, 'why is there waste?' indicates how strongly the culture of resource waste is set in the mind of the construction industry, and reveals the logic and commercial judgement that fuels such a culture.

The key finding is that waste is not seen as a mark of failure, but often as an indicator of success.

However, once alerted to environmental issues, there was a universal interest. Everyone who took part in the surveys said that this project was a wake up call to them on matters of sustainability and waste management.

- The majority of people admitted that they had not thought about the environmental impact of their construction work.
- No respondent had heard of London Remade, Reth!nkRubbish or the Mayor's Green Procurement Code.
- For clients the key priorities in a building project are cost, contract period and design.
- For Architects the first priority is design and the second compliance with the regulations. Waste management is seen as a problem for others.
- There is an awareness of the high levels of waste among Quantity Surveyors, but it is accepted as the norm for the industry.
- For builders:
 - High wastage is accepted practice, justified by the fact that labour is more expensive than materials.
 - The issue of waste is not raised by clients or architects when they commission work.
 - The industry is paid on output not resource efficiency.
- The construction process is innately wasteful. Refurbishment is an inexact science, and carefully formulated project plans which are the basis of resource efficiency often have to be abandoned once work has started.
- For the building products industry, the fiercely competitive nature of the construction industry market place drives their agenda. The environment is not part of this.

The discussions shed considerable light on the value of various methods for changing 'hearts and minds':

- **Increase the cost of waste disposal?** To an outsider there are clear financial savings to be made by improved resource use. But those working in the industry pass the cost down the stakeholder chain, and it ends up on the client's final invoice. It is clear clients are either unaware of these costs, or unwilling to challenge them. Using taxes to increase costs can have a

negative impact because environmental issues are seen as a financial burden rather than a social responsibility.

- **More legislation?** There is already a very large body of construction related environmental legislation. However little is known of this in the SME sector, even of significant recent additions such as the Landfill Directive, Hazardous Waste Regulations and Part L of the Building Regulations. On its own, legislation has low penetration or impact on a sector which regularly works (it would argue out of necessity) on the wrong side of the law. Much legislation, for example on health and safety, is often ignored.
- **Rewards for good environmental practice?** Most builders would view favourably a form of official accreditation that reflected environmental concern and good waste management if this was applied to all. Some public sector clients are leading the way by including waste minimisation in their tenders. If this approach delivers clear benefits (particularly on cost) to contractor and client there is scope for wider initiatives.
- **Improved risk management?** Construction has a contractual culture where each part of the supply chain tries to pass liability on to the next level. The environmental agenda is perceived to add risk, and there is currently no clear ownership of this responsibility. Each part of the supply chain will wait until its clients insist on change (and pay for it) before they alter their ways. A new culture of common ownership of the environment agenda, planning and sharing environment responsibility would bring a major change.
- **More education?** The resounding message from our survey is the clear need for improving education and communication:
 - to address the acute lack of knowledge on environmental best practice by all parties to the construction process
 - to help clients be aware of the environmental cost of their projects
 - for builders to understand the economics of waste management
 - for the industry to provide training at all levels from apprentice to manager in environment issues.

Section 2 – The Cafe Van

2.1 Project design

Construction has a highly visible impact on the local community. It creates, adapts and maintains the physical spaces in which people can take a more responsible approach to their environment; at home, work, and at leisure. Ideally, this should be achieved by demonstrating the highest possible levels of sustainable good practice. At the moment this rarely happens, and the principal reason that emerged from the 'Ask the fellows...' project was not that construction workers don't care; it is just that nobody has explained the problem.

Our main conclusion from the 'Ask the fellows...' project was that a priority for action was an education and awareness-raising initiative designed to:

- **explain** – why the environmental agenda is important and relevant
- **engage** – with the thoughts and minds of the industry workforce
- **communicate** – at a time and in a place which understands and works with the commercial priorities of construction companies.

Evidence from the 'Ask the fellows...' project, combined with Kotuku's practical knowledge of the way the construction industry works in reality (rather than as the 'authorities' would have us believe) clearly suggested we had to take the environmental messages out into the sites. The challenge was to design a process that would engage without disrupting the working day. Hence the Cafe Van was created.

The Cafe Van is precisely that – a van that arrives on site during tea breaks, bringing drinks and sandwiches. While the site workers are being refreshed, Kotuku delivers three half-hour interactive presentations on resource efficiency in building. Each session is organised to fit in with the working day of the business and to reflect the type of work and the trades on site.

Using specially written material and short films, topics covered include:

- sustainable construction
- waste and hazardous waste
- water pollution
- environmental impact of common building materials
- legislation and the Building Regulations.

People who attend the three presentations receive a certificate of environmental awareness.

The key benefits of the concept:

- It is trusted by site staff and workers because it is run by builders for builders.
- The timing and session arrangements are flexible and aim to minimise disruption to the working day.
- Hot and cold drinks and food are provided to create an informal and relaxed atmosphere and allow workers to recharge their batteries while learning.
- Each session lasts half an hour, so concentration levels are maintained.
- The presentations are made relevant to the working conditions of the people who attend.
- The presentations are run on site and utilise any available space.
- There is no cost to the companies.

Impact measurement is essential and we incorporate a structured evaluation method into the presentations. Participants complete one questionnaire before seeing any of the presentations, and a second after they have completed the 'course'.

This approach enables objective evaluation of the project and development of training materials. It also allows a less formal assessment of the "mood of the industry" as there is space for comments and observations.

2.2 Results and discussion

2.2.1 The view from the van

During the twelve month trial of the Cafe Van we made 123 presentations and awarded 310 certificates of environmental awareness.

Full details of the sites visited, the before-and-after questionnaires, and a detailed breakdown of the results are available by contacting Andrew@kotuku.org.

Highlights included:

- The site agent who said his labourer now gives environment talks to sub-contractors when they come on site.
- Seeing site managers, office staff and site workers all in the same room discussing environmental issues together.
- The constantly positive feedback from attendees about the benefits they derived from the project.
- The requests to visit other sites and to return to existing sites at a later date.
- The company environment manager who said how helpful it was to have someone from outside the firm giving the environment message.
- The major road project whose £23 million building project could be halted if the flight path of horseshoe bats was disrupted.
- The owner of a Polish building firm who carried out simultaneous translation while we made our presentation.

There were some surprises:

- The undermining of the myth shared by the public and government that the construction industry is unconcerned about its impact on the environment. We found a high level of personal concern, interest and care.
- The enormous difference between the management structure and systems of large and small companies. For many small companies there simply is no management system and so they are bypassed by conventional initiatives.
- The low level of compliance with health and safety good practice and legislation that was the accepted norm on many small sites.
- The immense knowledge gap on the most simple of environment issues – most site personnel had neither heard of 'duty of care' nor knew what constitutes hazardous waste.
- How easily the goodwill of the most committed environmentalist can be alienated – for example by the stringent enforcement of totally impractical legislation by the Environment Agency.

2.2.2 Feedback from the tea drinkers

Analysing the responses to the before-and-after questionnaires shows a marked improvement in participants knowledge in every subject covered.

Nearly 88% of participants stated that the presentations influenced the way they will work on site.

Comments from participants include:

- 'Greater awareness of environmental issues.'
 - 'Greater interest to comply as I understand the consequences better.'
 - 'To manage the waste process more efficiently.'
 - 'More aware of materials on site and how they can be re-used'.
 - 'I will be more likely to segregate waste on site.'
-
- On **environmental issues in construction**, over 96% of participants had a medium to high knowledge after the presentation, compared to just over 48% prior to the presentations.
 - On **sustainability and resource efficiency**, more than 62% of participants had low or no knowledge prior to the presentations. This reduced to just over 4% afterwards.
 - On **Duty of Care**, 50% had low or no knowledge of the duty of care in waste management prior to the presentations. This reduced to 6% afterwards.
 - On **waste segregation and recycling**, 94% of participants had high or medium knowledge after the presentations, compared to just over 50% before the presentations.
 - On **what happens to construction waste**, over 93% of participants had a medium to high knowledge after the presentation, compared to 40% beforehand.
 - On **hazardous waste regulations**, more than 63% of participants had low or no knowledge prior to the presentations. This reduced to just over 11% afterwards.
 - On **water pollution**, over half the participants had low or no knowledge prior to the presentations. This improved to over 90% of participants having a medium to high knowledge after the presentations.

- On **impact of construction work on the local environment**, over 93% of participants had high or medium knowledge after the presentations, compared to just over 50% before the presentations.
- On **the products you use in your daily work**, participants generally had some knowledge of these. However, before the presentations over 10% had no knowledge on this issue. This reduced to just fewer than 2% after the presentations.
- On **landfill tax**, a large percentage of participants had low or no knowledge prior to the presentations (over 77%). This improved to nearly 89% of participants having a medium to high knowledge after the presentations.
- On **Building Regulations**, 54% of participants had a medium to high knowledge prior to the presentations. This improved to just over 86% after the presentations.
- On the **Waste of Electrical and Electronic Equipment (WEEE) Directive** there was little knowledge among participants prior to the presentations (nearly 90% low or no knowledge). This reduced to just over 14% after the presentations.

2.2.3 Feedback about the Cafe Van

While the questionnaires consistently confirmed the large knowledge gap on environment issues first noted in the 'Ask the fellows...' project, we also gathered feedback about the Cafe Van concept:

- The Cafe Van formula broke down traditional barriers felt about 'going back to the classroom', and between 'Staff' and 'Site'.
- The project worked as well for a large multi-office company as it did for SME's.
- The project is suitable for all levels of worker from site labourer to manager (and works best when they are all in the room at the same time).
- The project agenda is as topical in South Wales as Central London.
- The certificate is an important element encouraging attendance and recognising achievement.
- The project's ability to be flexible and 'fleet footed' – responding to the changing site conditions – gives it an integrity that leads to acceptance on site. The best intentioned builders' plans can change at the last moment, attendees can be on the wrong site, or there is a delivery in the middle of the presentation!

Attendees would like to learn more:

- Nearly two thirds of the participants were highly keen to learn more about the issues, with the other third being quite keen.

The impact is not just on commercial waste:

- For example, over 83% of participants recycle at home. Introducing good practice at work has well recognised benefits in complementing and reinforcing good practice at home.

A lesson of management

- A large number of participants believe improvements to the management of materials on site will lead to cost savings.

They like the Cafe Van approach:

- Three half-hour, site based tea break presentations with snacks and beverages are well appreciated by all participants.

There was a very positive response to the value of the sessions:

- 'I've learned a lot more than I knew and (it) has opened my mind to think more about certain things.'
- 'Really enjoyed the sessions and found it very interesting and gave me a better insight.'
- 'Interesting and different way of explaining projects and how engineering affects the environment.'
- 'Good, useful, and I hope that we can have more presentations in the future.'
- 'Short, snappy with lots of relevant info.'

3. Conclusions

Together, the 'Ask the Fellows...' and 'Café Van' projects set out to establish an effective way to help SME's in construction improve their environmental performance, and particularly to reduce levels of waste and increase their use of recycled materials.

The combined project is unusual because it had the scope to research an issue, make recommendations, and then practically test and assess these recommendations.

If we had an opening view-point, it was left unspoken in the implications of our first question, 'Why is construction industry so wasteful?' – The obvious response being, 'because the industry is only interested in short-term issues, and does not care for the long-term consequences of its actions'.

What has emerged from this survey is that care and concern is part of the construction industry, and that individuals at all levels in the stakeholder chain are deeply committed to working responsibly and sustainably.

However, the apparatus of construction procurement is so complex that it takes on a life of its own, driving an agenda of risk minimisation that is often in contradiction to good environmental practice. This is very hard to challenge and counter in a low-margin industry working under the constant pressure to deliver complex projects on time, budget and to standard.

By proposing a different approach to training, and showing people at the heart of the industry the relevance of the environmental agenda and the difference they can each make, we have proved that it is possible to change attitudes and set in motion a new level of awareness that will lead to a more sustainable construction industry. After a successful year piloting the project and developing a replicable template we are ready to extend to a wider Construction Industry audience.

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Appendix 1 – Funding for the projects

'Ask the fellows...' was funded by London Remade



London Remade is in the business of recycling, creating environmental solutions for a sustainable capital

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Build UP



Appendix 2 – Marketing issues

During both projects we learnt important lessons in how to approach and engage the target audience. Our findings are summarised below:

A2.1 Lessons from the 'Ask the fellows...' survey process

The problems we encountered are a symptom of the constant pressure under which the industry operates. It regularly commits to deliver at a price that is not quite realistic, in a timescale that is not quite possible, with a labour pool that is not quite large enough and to a design that is not quite ready. Whether a one-man-band or a large organisation, the industry works under the strain of constant deadlines. In trying to engage with those at the sharp end of the industry we found we were low on the priority list!

- A face-to-face interview with one store manager was made standing up in the corner of his over-crowded office in between dealing with staff queries, irate customers and unscheduled visits from supplier representatives.
- The only way to interview the director of one of the skip companies was on his mobile phone early in the morning.
- The first builder groups had nine respondents confirmed. In these groups two turned up for one and one turned up for the other. It is no coincidence that the people who did turn up were either from the larger sized companies or had a management background in large companies. None of the typical SME builders turned up. When followed up the reasons given included injury, unexpected tenders, problems on jobs and misplaced details of the time and location.
- There were numerous instances where face-to-face interviews had been arranged but the contractor was not able to attend at the appointed place and time.

Although these problems of engagement made the number of respondents in our initial survey lower than we had expected, they directly contributed to the development of the Cafe Van technique – which aimed to work round these difficulties.

A2.2 Lessons from the Cafe Van project

While the unique structure of the presentations has been central to the success of the project at site level, of equal importance has been marketing the project and engaging firms in the first place. We have devoted considerable attention to marketing, and drawn some useful conclusions.

- Although we have a well visited and easy to use website, very few enquiries are received using the web booking form
- Good connections with key construction organisations has been very helpful in general promotion of the project but not in recruiting firms

- Blanket mail shots alone achieve nothing – they need to be targeted and closely followed up.
- Going onto building sites and talking to people is very effective, but the initial contact needs dedicated follow up.
- Networking is equally effective, but requires considerable time and dedication.
- A longer term project develops its own momentum and generates an increasing number of unsolicited enquiries.

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