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Resource Efficiency & Waste Management

Version A: October 2011

WILLMOTT DIXON

Introduction

Willmott Dixon has a commitment to send zero waste to landfill by 2012. The commitment applies to all waste generated at Willmott Dixon Group construction sites and offices. Zero waste to landfill will be achieved through a combination of **resource efficiency** to use fewer materials, generate less waste and eliminate non-recoverable waste; and effective **waste management** to ensure that all waste generated is re-used, recycled or recovered.

The zero waste to landfill commitment aims to minimise the impact of waste generation and disposal from Willmott Dixon projects, recognising environmental and social impacts including:

- Smarter use of natural resources
- Wasteful disposal of materials with high embodied energy, where alternative reuse, recycling and recovery options exist
- Scarcity of landfill space
- Landfill gas emissions, leachate and nuisance from landfill operations
- Impacts of fly-tipping on neighbourhoods and communities.

Commercial drivers for the business to improve waste management include:

- Minimising the impact of rising costs of waste disposal on the business
- Reducing the true (hidden) costs of waste, including the value of wasted materials and labour to move materials around site
- Mitigating the impact of the increasing costs of materials
- Gaining a competitive advantage through demonstration of sector-leading waste practice.

Figure 1: Segregation for recycling at a Willmott Dixon project

Background

The construction industry is the largest consumer of natural resources, using over 400m tonnes of material per annum. The industry also generates more waste than any other, and in 2008 generated 81.4m tonnes of waste (including demolition and excavation waste), almost half of the total 165.1m tonnes generated in England.

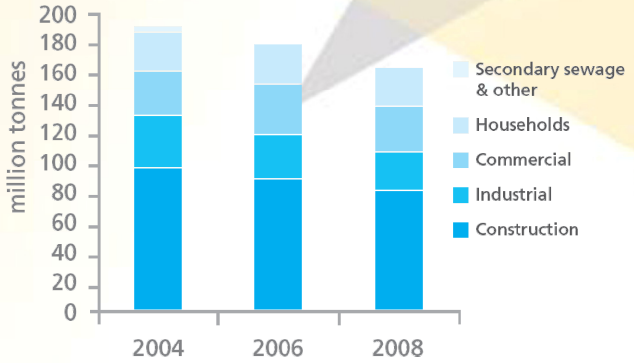

Figure 2: Waste generated by source (Review of Waste Policy in England 2011).

To address these issues the Government Strategy for Sustainable Construction 2008 published a target to reduce construction, demolition and excavation waste to landfill by 50% by 2012, compared to 2008.

The Waste and Resources Action Programme (WRAP) has the responsibility for coordinating initiatives towards achieving this target, and developed the voluntary sector agreement Halving Waste to Landfill, to which Willmott Dixon was one of the original signatories in 2008.

WRAP and the Strategic Forum for Construction published Waste: An Action Plan for halving construction, demolition and excavation waste to landfill in June 2011, detailing the key challenges and actions for the construction industry in England to deliver resource efficiency across the supply chain and lead to a reduction in the amount of construction, demolition and excavation (CD&E) waste landfilled.

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Duty of Care

Any person who produces, imports, carries, keeps, treats or disposes of controlled waste, or acts as a broker has control of such waste, has a duty of care to ensure that it is managed, and recovered or disposed of legally.

Key documentation and checks that must be recorded for all waste movements from Willmott Dixon projects, as required by legislation are:

- **Waste transfer notes** providing details of the transferor and transferee; time, date and location; and description and quantity of waste;
- **Waste carrier registration** to ensure that the person or organisation that takes control of the waste is registered to do so;
- **Permit/exemption** to ensure that the treatment or disposal facility is able to accept.

For detailed information on duty of care requirements please see the relevant environmental management system (EMS) guidance notes here.

The Waste Hierarchy

The revised European Union (EU) Waste Framework Directive places greater emphasis on the waste hierarchy to ensure that waste is dealt with in the priority order illustrated below. This is transposed into UK legislation through the Waste (England & Wales) Regulations 2011:

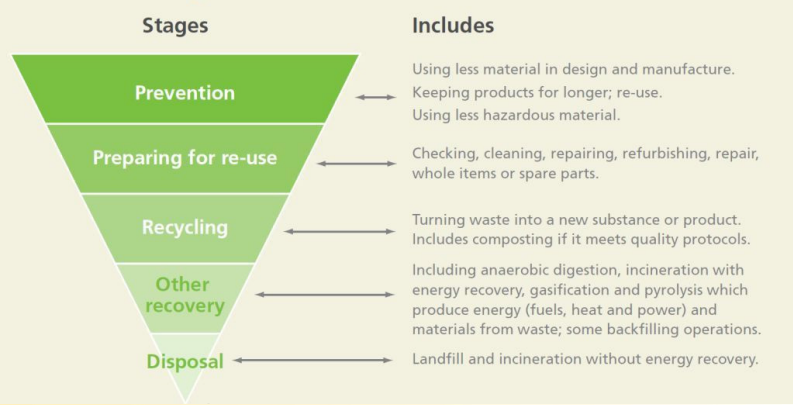


Figure 3: The Waste Hierarchy (Government Review of Waste Policy in England 2011)

Site Waste Management Plans

The Site Waste Management Plans (SWMP) Regulations 2008 are the main legislative mechanism to ensure a strategy for resource efficiency and waste management on major construction projects. A SWMP estimates the amount and type of waste to be generated from a construction project, specifies how it will be reused, recycled and disposed of, and measures actual waste generated.

The Regulations require a basic SWMP be developed for projects with a contract value above £300,000 and a detailed SWMP for projects above £500,000 (values excluding VAT). Detailed SWMPs must:

- Identify the client and the principal contractor, and contain a declaration that they will follow the waste Duty of Care and ensure that materials will be handled efficiently and waste managed appropriately;
- Identify the person who drafted the SWMP;
- Describe the location and cost of the project;
- Record design decisions taken to minimise the quantity of waste generated;
- Describe and estimate the quantities of waste expected to be produced;
- Identify waste management actions for each type of waste;
- Describe waste being removed, the identity of the person removing it, waste carrier registration number and where the waste is being taken;
- Record the types and quantities of waste produced and whether this has been reused on-site or off-site, recycled on-site or off-site, recovered on-site or off-site, sent to landfill or otherwise disposed of;
- Be reviewed not less than every six months;
- Be reviewed within three months of the work being completed, with a comparison of estimated and actual quantities of waste, confirmation that the plan has been monitored on a regular basis and explain any deviation from the plan, and estimate cost savings achieved through the SWMP.

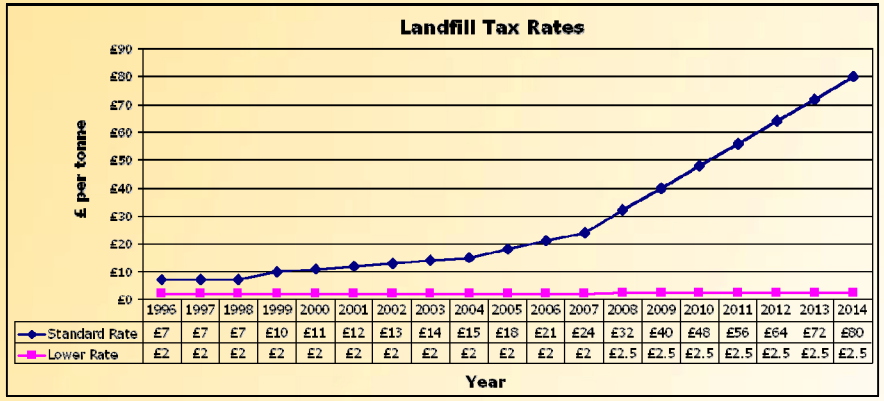
If a project is started without a SWMP, the client and principal contractor are both guilty of an offence. Any person found guilty of an offence under the Regulations can be fined up to £50,000, with fixed-penalty notice of £300 for failing to produce a SWMP when required to do so upon inspection. Local authorities and the environment agency enforce the use of SWMPs.

For more information on site waste management plans, see the relevant environmental management system (EMS) Guidance Notes here.

The Cost of Waste

The removal and disposal of waste attracts significant costs. A large proportion of the cost of disposing of waste to landfill is paid as landfill tax on top of normal fees by businesses and local authorities operating landfill sites. The landfill tax is designed to encourage businesses to produce less waste and to use alternative forms of waste management.

The landfill tax was first introduced in 1996 at a standard rate of £7 per tonne, and was the UK's first tax with an explicit environmental purpose. Since 1999, the cost of landfill tax has risen via the 'landfill tax escalator' which has increased the rate of landfill tax per tonne on an annual basis. From April 2011 landfill tax stood at £56 per tonne, and will increase by £8 per year until at least 2014 when it will reach £80 per tonne.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Standard Rate	£7	£7	£7	£10	£11	£12	£13	£14	£15	£18	£21	£24	£32	£40	£48	£56	£64	£72	£80
Lower Rate	£2	£2	£2	£2	£2	£2	£2	£2	£2	£2	£2	£2	£2.5	£2.5	£2.5	£2.5	£2.5	£2.5	£2.5

Figure 4: Increasing cost of waste disposal - Landfill Tax rates 1996-2014

By avoiding disposal of waste to landfill, the costs of landfill tax are avoided and replaced by the costs of treatment by reusing, recycling or recovery of the waste materials. While some recycling and recovery operations can be relatively expensive, as these technologies become more widely available, disposal to landfill costs increase and the value of reused and recycled materials increases, the commercial viability of managing waste further up the hierarchy becomes increasingly possible.

The True Cost of Waste

Willmott Dixon Group spent more than £2.5m on directly-procured skips in 2010, a cost not including waste removed by subcontractors (e.g. included in demolition and excavation packages). A Willmott Dixon study in 2009 calculated that the 'true cost' of a skip – including the cost of materials and labour to fill the skip - was more than four times the skip hire cost:

Figure 5: Willmott Dixon study on the true cost of a 12 yard skip (2009)

Applying these figures to Willmott Dixon's skip spend calculates that the true cost to the business in 2010 of waste disposed in directly procured skips was in excess of £10m.

Importantly, clients are increasingly requiring evidence of cost reduction through improved resource efficiency, and effective and responsible waste management. This, coupled with the increasing cost of materials and disposal, means that the prevention and efficient management of waste is playing an increasingly important role in ensuring Willmott Dixon remains competitive.

Construction Waste

The majority of Willmott Dixon waste generated through construction activities undergoes sorting and treatment by waste management contractors (WMC) in preparation for reuse, recycling recovery or disposal. The performance of these WMCs is therefore crucial in determining Willmott Dixon's diversion from landfill performance, and their selection must be carefully considered.

We therefore have a prescribed process to audit WMCs in order to ensure they are able to meet required service and performance levels, can demonstrate full legal compliance, and provide comparison with other potential providers to ensure we continue to work with those with the best performing diversion from landfill rates. See here for Willmott Dixon's Waste Contractor Audit Sheet. We seek to work with waste service providers who report in accordance with PAS 402: Waste Resource Management - Specification for Performance Reporting

Many WMCs are installing advanced waste treatment technologies in order to realise the commercial benefits of increasing recycling and recovery, thereby sending less waste to landfill and avoiding associated taxes.

Demolition & Excavation Waste

Demolition waste accounts for 17% of all waste removed from our projects. The ICE Demolition Protocol provides a pragmatic set of methodologies to achieve resource efficiency in construction, demolition and refurbishment projects. This should be applied on all Willmott Dixon projects with large-scale demolition.

Excavation activities are the largest source of waste from Willmott Dixon projects, generating almost two-thirds of all waste (64%). The ultimate destination of excavation waste, therefore, has a significant influence on Willmott Dixon's overall diversion from landfill rates.

A wide range of options are available for the management of excavation waste in order to ensure 'waste' materials are diverted from landfill. The CL:AIRE Code of Practice details defined procedures by which both contaminated and uncontaminated materials can be re-used on the site of production, where clean naturally occurring soil materials can be transferred for re-use directly between sites or as part of a cluster arrangement,

For more information on implementing these initiatives on projects, please see the relevant environmental management system (EMS) Guidance Notes here.

Designing Out Waste

Waste prevention is the preferred and prioritised waste hierarchy option, and a key way to achieve this on projects is to design out waste.

The government-funded Waste and Resource Action Programme (WRAP) has a range of tools and guidance to assist design teams in identifying and evaluating options to design out waste. The publication 'Designing Out Waste: A design team guide for buildings' identifies five key principles that can be used during the design process to reduce waste:

1. **Design for reuse and recovery** e.g. reusing or reclaiming demolition and excavation materials from the site of construction, or other site.
2. **Design for off site construction:** e.g. prefabricated construction elements.
3. **Design for materials optimisation:** coordinating design with standard material dimensions, repetition and coordination of design to reduce the number of variables.
4. **Design for waste efficient procurement:** procurement of work packages with the lowest volumes of waste.
5. **Design for deconstruction and flexibility:** adaptable design, specification of reusable/recyclable components, allow for easy disassembly.

In addition, WRAP's online designing out waste tool can help design teams to identify opportunities to design out waste, and calculate the impact of these solutions including cost savings and embodied carbon.

For more information, tools and guidance, see here.